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Overview of national construction market in the Republic of Croatia

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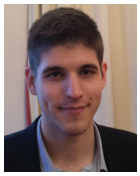

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Professional paper

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Overview of national construction market in the Republic of Croatia

A trend of strong construction works prices' growth has been noticed from 2018. This is particularly challenging from a strategic perspective for the Republic of Croatia in the context of complex infrastructure projects co-financed by the European Union, given the rules for implementing EU co-financed projects - primarily the implementation period, eligibility of costs, and achievement of performance indicators. Increasing costs on these projects generally requires an increase in the amount of national co-financing, with implementation difficulties arising from the necessary approval procedures for such increases. To analyse this trend in detail and elaborate its possible antecedents, an overview of national construction market up to 2020 is given in this paper. Results of construction industry indicators' analysis are shown, as well as their synthesis in accordance to the relationship between supply and demand. By exploring this market trend from technical and economical side, an unique overview for understanding it from perspective of historical trends is given; and possible factors that may contribute to a significant increase in the average offered prices of construction work in the Republic of Croatia are listed.

Key words:
price, construction, infrastructure, supply and demand, works, sector, market

Stručni rad

Mariela Sjekavica Klepo, Mate Damić, Goran Milaković, Siniša Radaković, Petar Peroš

Pregled nacionalnoga građevinskog tržišta u Republici Hrvatskoj

Od 2018. primijećen je trend znatnog porasta cijena građevinskih radova. To je za Republiku Hrvatsku posebno izazovno sa strateškog aspekta u kontekstu složenih infrastrukturnih projekata sufinanciranih sredstvima Europske unije imajući u vidu pravila provedbe projekata koje sufinancira EU, ponajprije razdoblje provedbe, prihvatljivost troškova te ostvarenje indikatora uspješnosti. Povećanje troškova na tim projektima u pravilu iziskuje povećanje nacionalnog sufinanciranja, uz otežanu implementaciju zbog provedbe potrebnih procedura odobravanja takvih povećanja. Kako bi se detaljno analizirao navedeni trend te elaborirali mogući uzroci, u ovome radu dan je pregled nacionalnoga građevinskog tržišta zaključno s 2020. Prikazani su rezultati analize indikatora građevinarstva tijekom godina te njihova sinteza u pogledu odnosa ponude i potražnje. Istraživanjem toga tržišnog trenda s tehničke i ekonomske strane pruža se jedinstven pregled za njegovo razumijevanje iz perspektive povijesnih kretanja te su navedeni mogući čimbenici koji utječu na znatno povećanje prosječnih ponuđenih cijena građevinskih radova u Republici Hrvatskoj.

Ključne riječi:
cijena, građevinarstvo, infrastruktura, ponuda i potražnja, radovi, sektor, tržište

1. Introduction

Since 2018, a specific trend of increasing construction costs has been observed, marking a notable shift in Croatia's construction history. This development has strategically significant repercussions for public sector investments, as the public sector is predominantly responsible for major and complex construction projects, often co-financed by the EU, particularly in the field of infrastructure. The primary purpose of these projects is to create the necessary preconditions for meeting the complex needs of society [1].

Between 2008 and 2018, there was a significant disparity between the estimated values of construction works and the extremely low bid prices. Bidders in public procurement procedures tended to submit bids that were likely lower than the actual project costs in order to win tenders and secure construction contracts. One of the main reasons for this behaviour was the almost exclusive use of the lowest price criterion as the selection standard in public procurement procedures. However, this approach was disabled by public procurement regulatory changes that came into force on January 1, 2017. The market was driven by a "survival strategy," where the primary goal was to secure construction contracts, with the intention of modifying the terms of the contract later during the project's execution, if necessary. This trend was not limited to the Croatian market. Research indicates that, as a result of such market behaviour, construction projects with the lowest-priced bids often end up being completed at significantly higher costs than initially contracted [2].

Conversely, starting from 2018, the Croatian public investment market has witnessed an entirely opposite trend, with bid prices significantly exceeding the estimated procurement values. This trend has been particularly noticeable in EU co-financed projects, which must be managed in accordance with strict rules and within rigidly defined timeframes [3].

The aim of this paper is to provide an overview of the construction market and contribute to a better understanding of the rising price trend in construction works. This will be achieved through an analysis of construction industry indicators over the years, followed by a synthesis of findings regarding the state of the construction market and the relationship between supply and demand in both the national and broader global context.

The paper will present a current overview of relevant data on the construction market up to 2020. This information is intended to serve the scientific and professional community as a foundation for further research, analysis, and studies. It aims to foster a comprehensive understanding of Croatian construction, ultimately supporting the development of a strong, green, sustainable, and competitive national construction sector for the future - a goal to which the authors believe we should all wholeheartedly aspire.

2. Construction and economy

The construction sector plays a significant role in the overall economy of the Republic of Croatia and is closely linked to general economic, social, and financial trends. The construction industry serves as an indicator of broader economic movements - it is often one of the first sectors to signal an impending economic crisis but also a relatively reliable indicator of economic recovery. This sector exhibits characteristics of both the production and service industries, thereby exerting a substantial influence on the dynamics of economic growth. It has both direct and indirect impacts, employing a large number of people, including foreign labour. It drives the development of technologies, new materials, and innovations, anticipates trends in capital markets, and reflects shifts in production cycles (recessions) due to its high multiplier effect on production and sales across numerous industries [4].

Notably, the construction sector is predominantly project-oriented, employing a large workforce, while construction projects have significant political, social, environmental, and institutional implications. These projects also have a profound impact on the development of the overall economy by providing essential infrastructure. An analysis of key sectoral indicators over time reveals four distinct phases in the development of Croatia's construction industry:

- Phase of strong growth (2001 – 2008)
- Phase of recession (2009 – 2014)
- Phase of stabilization and mild recovery (2015 – 2017)
- Phase of further recovery (2018 – present)

One of the best indicators of the importance of the construction sector for the national economy is its share in gross domestic product (GDP) and gross value added (GVA). Figure 1 shows the trends in the share of the construction sector in GDP and GVA during the observed period.

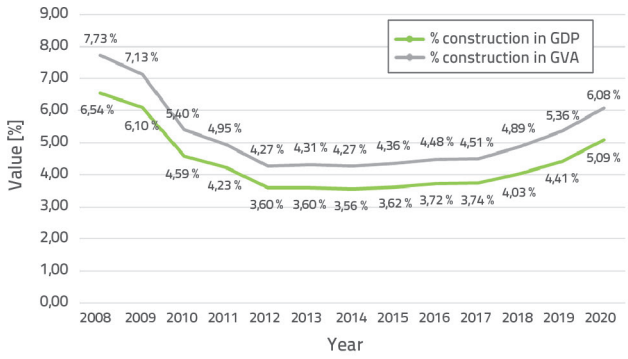

Figure 1. Share of construction in GDP and GVA in Croatia (source: [5]; author's analysis)

The presented values accurately reflect the shifts in the previously mentioned phases of the Croatian construction sector. From a share of 6.54 % of GDP in 2008, the sector experienced a significant multi-year decline, reaching a value of 3.56 % in 2014. It then stabilized at 3.74 % in 2017, followed by a gradual upward trend to 5.09 % in 2020.

In terms of the construction sector's share in total GDP, Croatia currently lags behind the European Union (EU-28), with an average of approximately 9 % [6]. When comparing countries with similar economic and geographical characteristics in

Figure 2. Total value of construction works in Croatia (source: [5]; author's analysis)

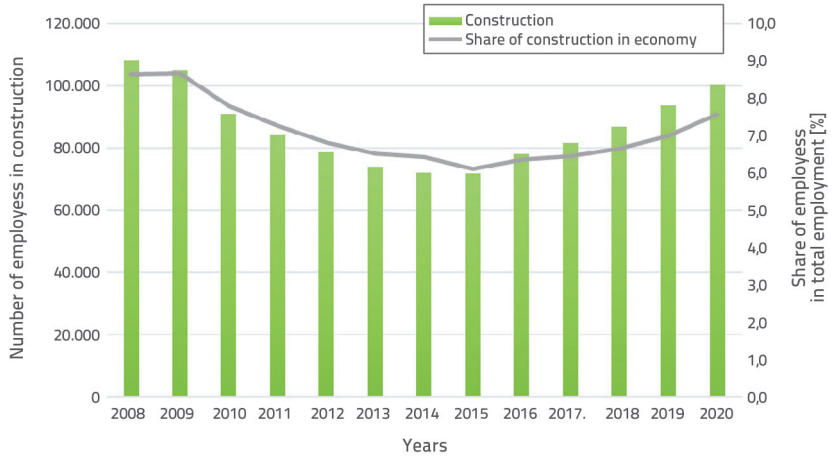

Figure 3. Employment in construction in Croatia (source: [5]; author's analysis)

was severely disrupted by the onset of the economic crisis. Key economic indicators, such as rising unemployment, declining wages, and consequently reduced consumption, had a significant negative impact on Croatia's construction sector. The effects of the recession were felt across Europe, but they were more pronounced in countries undergoing economic transition at the time, including Croatia. In contrast, the construction industries of older EU member states like Germany, France, the Benelux countries, and Scandinavian nations did not suffer such significant losses.

In addition to the reduction in the sector's share of total GDP by 3 % during this period, the overall value of completed construction works fell drastically (see Figure 2). The lack of investment to stimulate the construction industry - and consequently the entire economy - is evident from the 50 % drop in the total value of completed works over the six-year period, from EUR 4,63 billion in 2008 to EUR 2,32 billion in 2014.

Moreover, inflation trends during the observed period should not be overlooked. The average annual inflation rate was 2.2 % from 2008 to 2013, but it fell to –0.6 % during 2014–2016, before rising again to 0.9 % in the 2017–2020 period.

Europe (regardless of EU membership), the trend in Croatia's construction sector share of GDP during the observed period most closely resembles that of Slovenia, Serbia, and the Czech Republic. Economically less developed countries had an exceptionally high share of construction in GDP during 2008–2009, driven by the need for significant investments in essential infrastructure (e.g., Albania, Romania, Cyprus) [7].

A similar trend, though to a lesser extent, was also observed in Croatia up until 2009 and the onset of the recession. This was primarily due to substantial investments in transport infrastructure (road construction) and a sharp rise in the real estate market. Research from that period positioned the construction sector as one of the most dynamic industries in Croatia, with a significant contribution to overall economic growth and employment [8].

The positive growth and development trajectory of the construction industry

Consequently, the share of employed workers in the construction sector significantly decreased, as shown in Figure 3. The number of employees in the construction industry fell from 108.260 in 2008 to 72.028 in 2014, representing a decline of as much as 33 %.

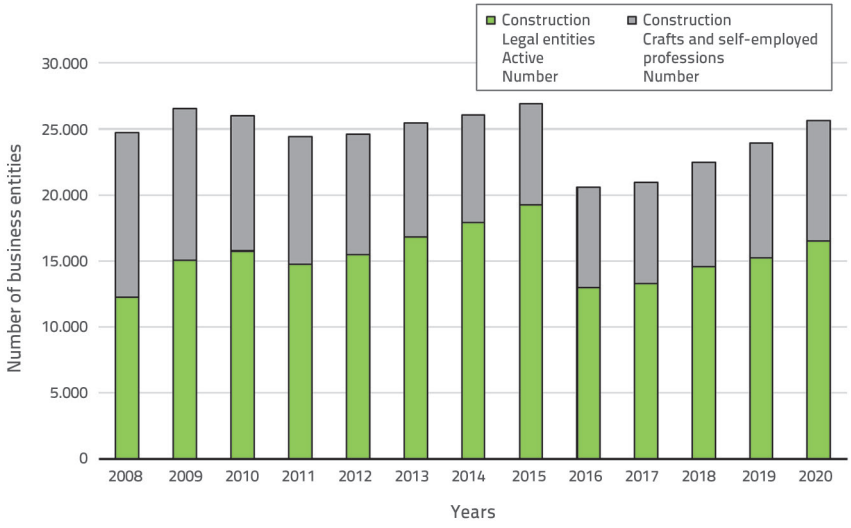

Figure 4. Number of business entities in construction in Croatia by structure (source: [5]; author's analysis)

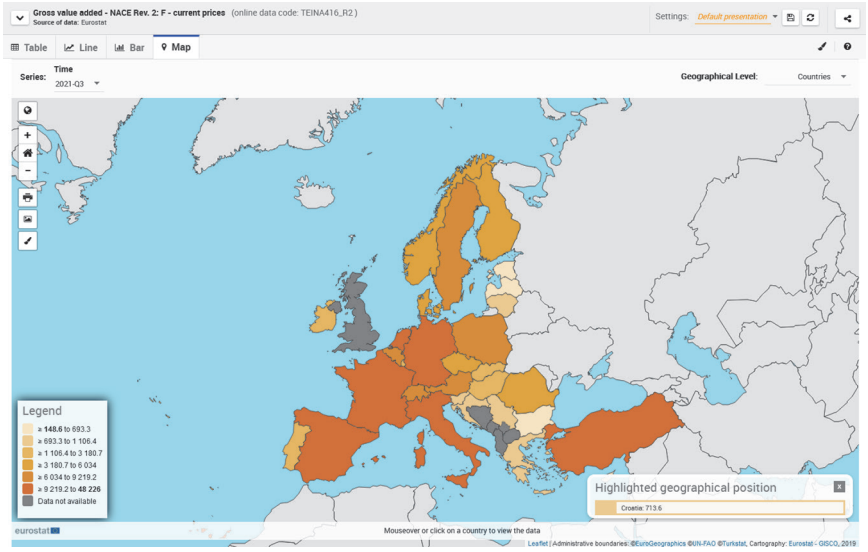

Figure 5. Gross added value of construction (mil EUR) [6]

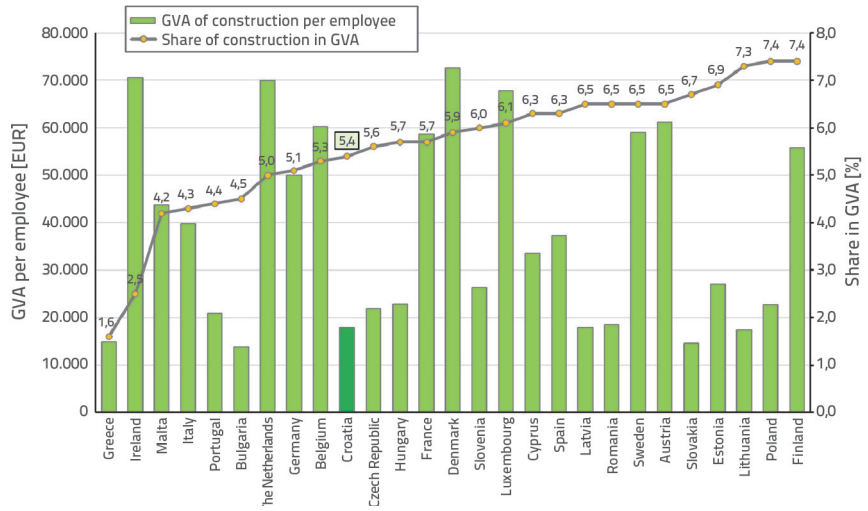

Figure 6. Gross added value of construction per employee and the share of construction in gross added value in the EU in 2019 (source: [6]; author's analysis)

had been significantly weakened by a prolonged recession. Therefore, it is not surprising that a stabilization period was necessary to re-establish positive trends in industry performance indicators.

The uniqueness of this trend is perhaps best reflected in the number of business entities operating in the construction sector, as shown in Figure 4.

The total number of business entities remained relatively unchanged during the recession period, as well as in 2008, contrary to the expected decline in this indicator due to the drop in the value of completed works and employment. A significant decrease in the number of construction business entities occurred in 2016, with a 24 % drop compared to the previous year. This was particularly reflected in the number of active legal entities - as many as 6.250 exited the market.

It was only in the period from 2018 to 2019 that an upward trend was observed in the number of business entities, as well as in the number of employees in the industry, the total value of completed works, and, consequently, the share of the industry in overall GDP.

Indicators such as the added value of the construction sector (Figure 5), gross value added (GVA) per employee, and the sector's share in total GVA (Figure 6) position Croatia among the countries where the construction industry is a significant driver of employment, but not necessarily of productivity, in the years for which the latest statistical data is available.

A significant opportunity for the economy, and consequently for the construction sector, was Croatia's accession to the European Union on July 1, 2013. The availability of non-repayable funds from EU financial instruments provided a substantial financial boost and increased demand for the successful implementation of infrastructure construction projects. This was essential for the Republic of Croatia, as an EU member state, to meet its obligations under various EU Directives across different sectors.

On the other hand, Croatia's accession to the European Union came after a period in which the national construction sector

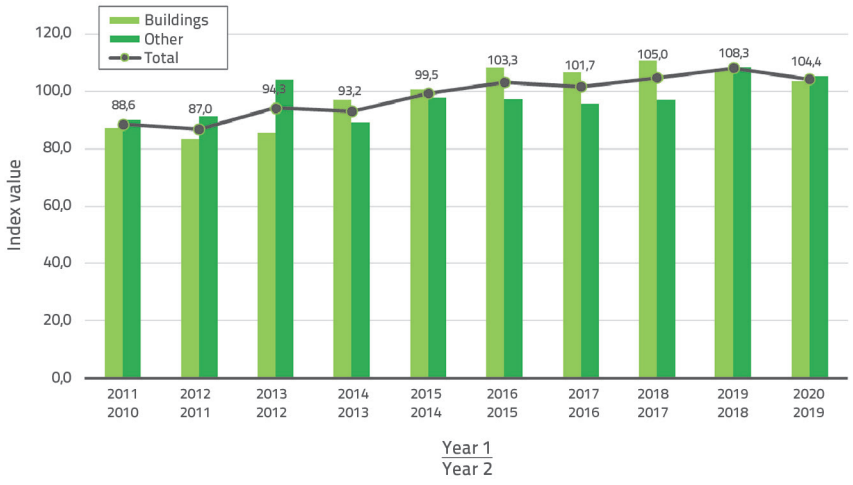

Figure 7. Volume indices of construction works (source: [5]; author's analysis)

Namely, older European Union member states manage to achieve significantly higher added value in the construction sector with a smaller number of employees compared to newer member states, including Croatia [7]. This is an indicator of reduced labour productivity.

The unfavourable position of the construction sector in Croatia is also evident from its below-average share of gross value added (GVA), which stood at 5.4 % in 2019 (Figure 6).

However, as other indicators suggest, the construction sector in Croatia is currently in a period of recovery. This is supported by the values of the construction work volume index (Figure 7), although it is important to emphasize that the volume of work and productivity per employee are not implicitly linked variables. To analyse the actual capacities of the construction sector today, it is essential to also consider other indicators - especially those related to human resources and the structure of economic entities.

3. Human resources in the construction sector

As indicated in Chapter 2 (Figure 3), the construction sector provides a significant number of jobs and generates new ones.

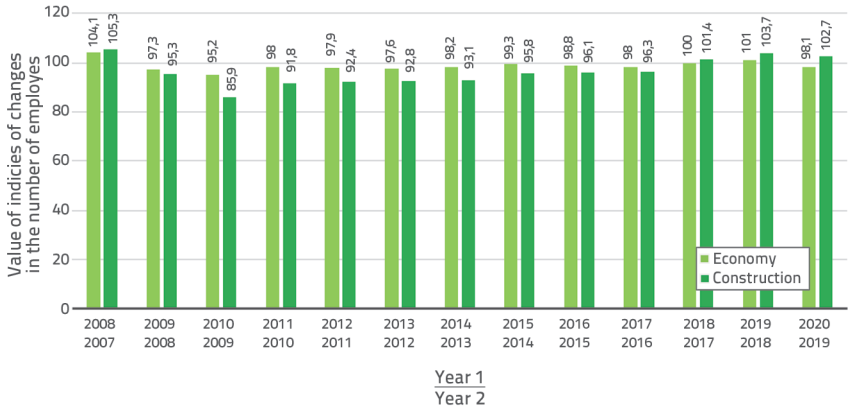

Figure 8. Indices of changes in the number of employees in legal entities (source: [5]; author's analysis)

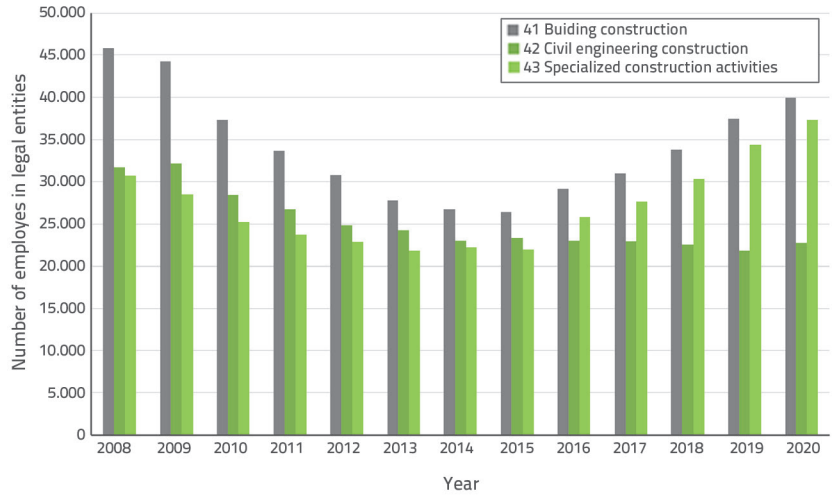

Figure 9. Number of employees in legal entities in construction by activity (source: [5]; author's analysis)

The typical characteristics of different periods in Croatian construction are also visible in the movement index of the number of employees in legal entities in the sector (Figure 8).

In 2020, the construction sector employed 7,6 % [5] of the total workforce, ranking it 6th among industries by the number of employees - behind manufacturing, wholesale and retail trade, education, public administration and defence, and health care and social services.

From the data shown in Figure 9, it is evident that the highest number of employees in the construction sector has consistently been in the building construction industry over the years, following the trends of recession, stagnation, and the subsequent recovery of the entire sector. Meanwhile, the number of employees in civil engineering has remained relatively constant over the years. Additionally, there has been a noticeable trend of employment growth in specialized construction activities since 2016, where the total number of employees last year even exceeded the number of employees before the recession. Specialized construction activities carried out on various types of buildings, requiring special execution or equipment, include: foundation works, waterproofing works, moisture removal from buildings, excavation of pits, installation of steel elements, reinforcement works, masonry and paving with stone, erection and dismantling of scaffolding and work platforms, chimney and industrial furnace construction, works requiring a specialized approach and involving climbing skills and the use of appropriate equipment; underwater works; construction of outdoor swimming pools; steam cleaning, sandblasting, and similar works on the exterior parts of buildings; crane and other construction equipment rental, which cannot be classified under specific types of construction works, with an operator.

The construction sector has had lower wages than the average wages in Croatia for years (Figure 10), with the largest wage gap observed in 2020 (a difference of 19 %). Wages have changed very little over the years, with the maximum wage increase compared to the previous year occurring in 2017, when the increase was only 37,96 EUR. On the other hand, wages in the overall economy have increased by 31 % compared to wages in 2008. This trend makes construction less attractive to the working population, especially considering that this trend is not linked to the overall increase in income and the volume of construction work during any period.

Table 1. Qualification structure of construction in relation to the average in 2020 (source: [5]; author's analysis)

Activities		Level of professional education							
		Graduate and postgraduate study	Undergraduate study	Short vocational studies	High school	Secondary vocational school	Semi-skilled	Primary school	No school
Total [%]	1.187.724	283.937	98.609	34.364	34.261	644.276	22.774	60.150	9.353
		24 %	8 %	3 %	3 %	54 %	2 %	5 %	1 %
F- Construction [%]	82.261	6.941	3.454	2.646	892	54.298	5.387	7.293	1.350
		8 %	4 %	3 %	1 %	66 %	7 %	9 %	2 %

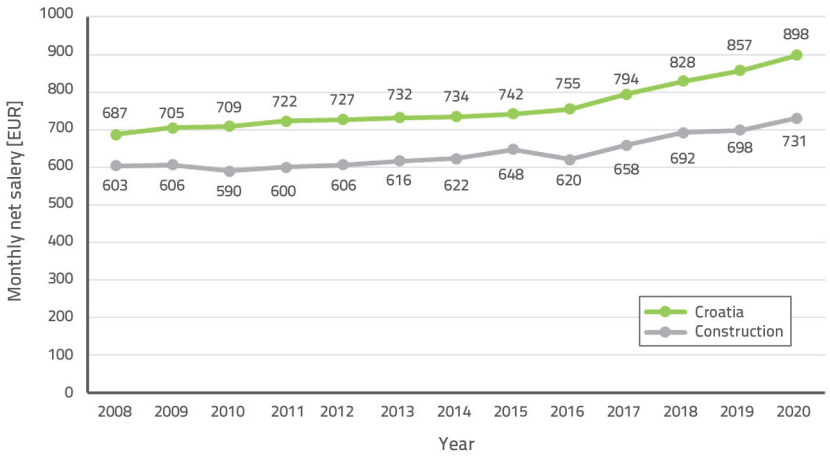

Figure 10. Average monthly net salary paid in the economy and construction (source: [5]; author's analysis)

The reason for this is also found in the qualifications structure of the sector, given the significant share of workers with primary or secondary education compared to the average (Table 1).

Interesting data was obtained by comparing the number of employed and unemployed individuals in the sector (Table 2).

In a situation without any specific disruptions, the data would suggest that the decrease in the number of unemployed and the increase in the number of employed individuals in a given year would be of similar magnitude, and vice versa. However, the difference in the changes in the number of unemployed and employed indicates that this is not the case. Moreover, in the period until 2018 (except for 2016), the number of employed individuals systematically decreased to a much greater extent compared to the increase in the number of unemployed, suggesting a significant outflow of the workforce from the country. From 2009 to the most recent year observed (2020), there were 16.322 fewer workers in the construction sector, which will need to be offset by a significant import of labour.

In the period from 2018 to 2020, the number of employed individuals increased several times more than the decrease in the number of unemployed, which indicates an influx of foreign labour into Croatia.

Regarding the import of foreign labour, the labour quotas for the construction sector have been a significant problem for years due to their insufficiency. According to data from the Ministry of the Interior [10], the import quota for construction workers increased from 500 in 2016 to 24.115 in 2019, and reached 33.300 in 2020. This sharp increase in import quotas is a response to employer needs and the large outflow of workers to other European Union countries and beyond.

This situation has gradually led to an increase in wages in Croatia at a general level. For example, in 2018, the gross hourly wage rose by 4,6 % compared to the previous year, while the EU saw a rise of 2,6 % [5, 6]. However, in absolute terms, the total cost of an hour of work in Croatia last year was 6,9 EUR, while in the EU it was 28,5 EUR, making other countries more attractive for living and working.

Table 2. Movement of employed and unemployed in construction (source: [9]; author's analysis)

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total number												
Unemployed	20.586	30.856	30.812	31.203	31.551	27.805	22.549	17.300	13.029	10.445	9.430	9.149
Employed	104.978	91.052	84.194	78.579	73.832	72.028	71.751	78.031	81.604	86.727	93.679	100.093
Change compared to the previous year												
Unemployed		10.270	-44	391	348	-3.747	-5.255	-5.250	-4.270	-2.584	-1.015	-281
Employed		-13.926	-6.858	-5.615	-4.747	-1.804	-277	6.280	3.573	5.123	6.952	6.414
Difference (unemployed – employed)		-3.656	-6.902	-5.224	-4.399	-5.551	-5.532	1.030	-697	2.539	5.937	6.133

Table 3. Index of working hours in construction (2015 = 100) (source: [5]; author's analysis)

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Construction	94.2	87.8	79.4	76.1	63.8	59.8	54.0	100.0	99.1	96.3	100.9	111.0	131.8

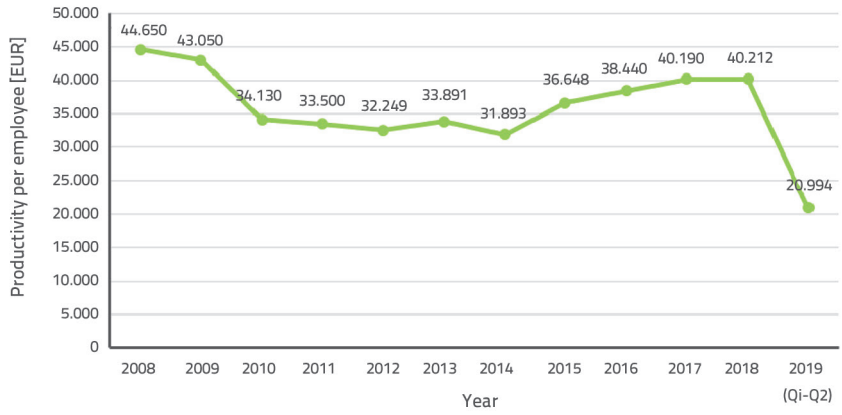

Figure 11. Productivity per employee in construction (source: [12]; author's analysis)

Future wage reductions can be expected with the enactment of the new Foreigners Act (NN 133/20), which proposes full liberalization of the labour market, making quotas for importing foreign workers a thing of the past [11]. Despite the negative trends, labour productivity (Figure 11) has been steadily increasing since 2014.

A similar trend is observed in the movement of the labour hours index in construction, which has been steadily increasing since 2017 (Table 3).

In order to gain a comprehensive understanding of the market situation, in addition to the indicators related to

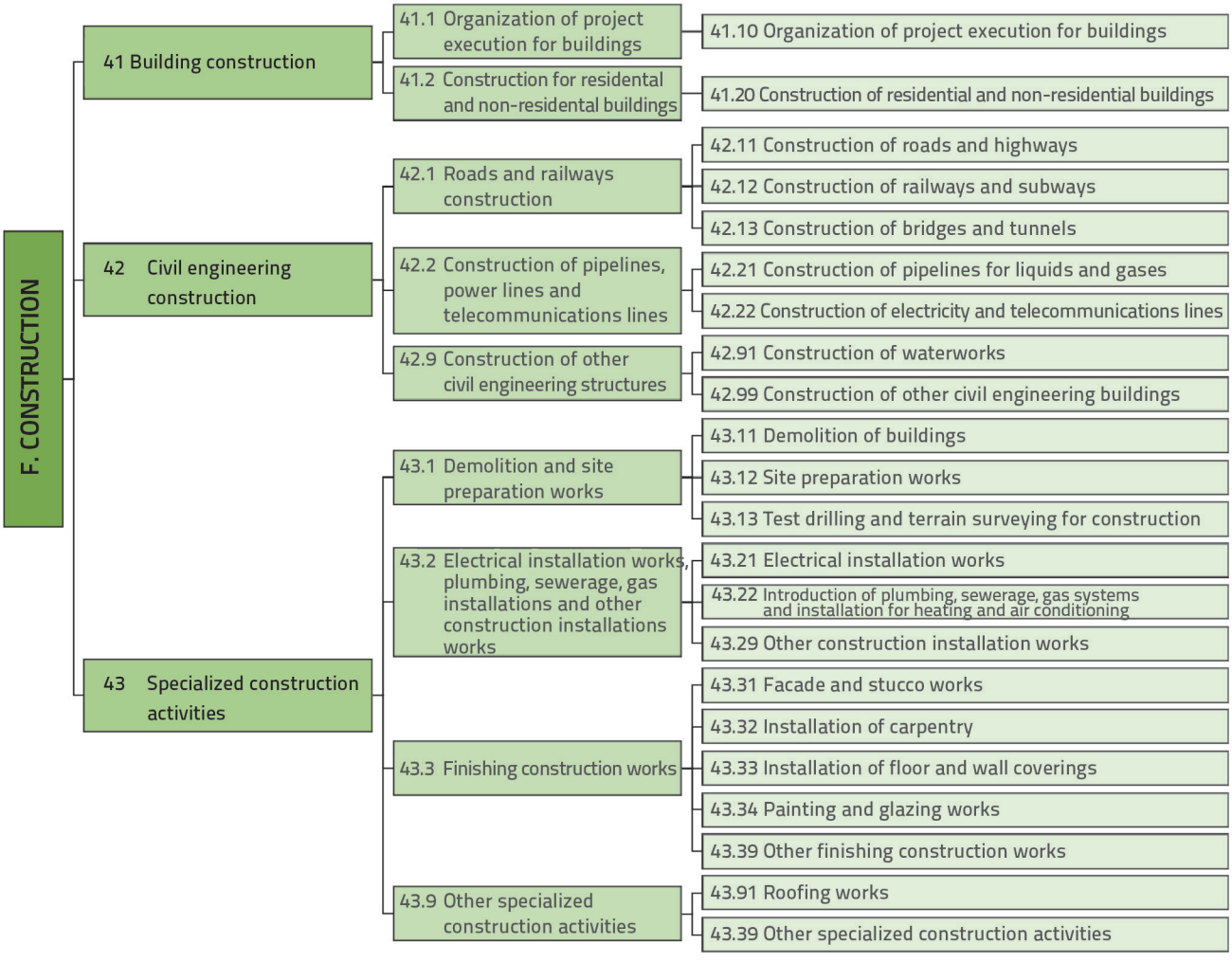

Figure 12. Breakdown of construction activities according to the NCA 2007 classification (source: [14]; author's analysis)

employment, wages, and productivity in the sector, indicators related to the structural characteristics of the construction sector have also been analysed. The results of this analysis are provided in Chapter 4.

4. Structural characteristics of the construction sector

According to the National Classification of Activities from 2007 [14], construction is divided into three sections:
- 41. Building construction
- 42. Civil engineering construction
- 43. Specialized construction activities

A detailed breakdown of activities is shown in Figure 12.

According to the data maintained by the Croatian Bureau of Statistics [5], completed works are divided by type of building into works carried out on buildings and works carried out on other structures. Works carried out with in-house workers in business entities with 20 or more employees. By type of work, completed works are divided into new construction and other works (reconstruction, repairs, and maintenance of existing buildings). Data is also available on the structure of the value of completed works by types of buildings: non-residential buildings, residential buildings, other unmentioned buildings, transport infrastructure, pipelines, communication and energy networks, and complex buildings in industrial areas. The data for these works is provided below.

Figure 2 shows the total value of completed works in construction in Croatia during the observed period, while Figures 13 to 15 show the structure of completed works.

The percentage of works completed by in-house workers compared to those carried out by subcontractors has mostly remained unchanged during the observed period (70 : 30) (Figure 13).

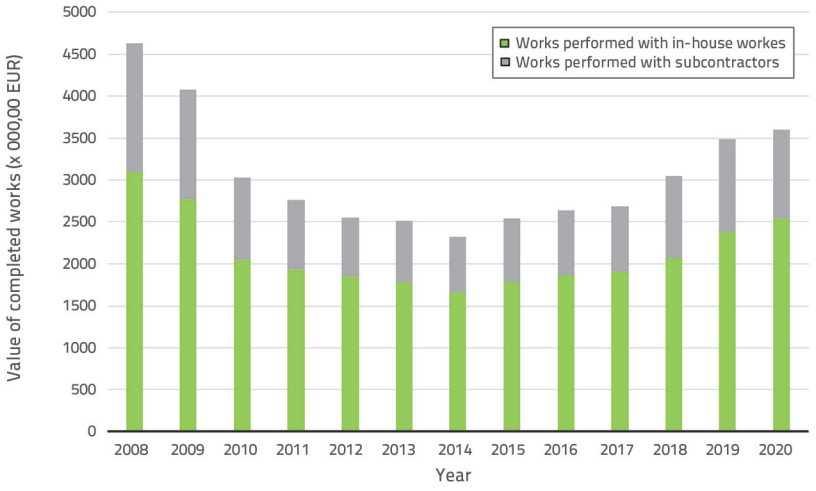

Figure 13. Structure of the total value of construction works in Croatia (source: [5]; author's analysis)

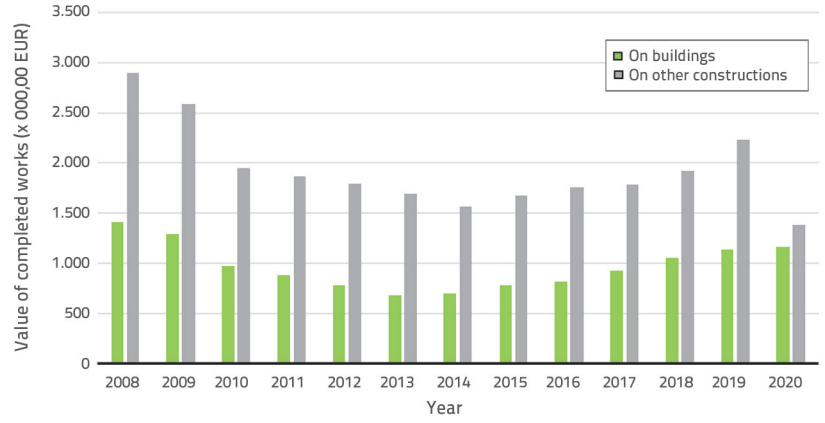

Figure 14. Value of completed works by type of construction (source: [5]; author's analysis)

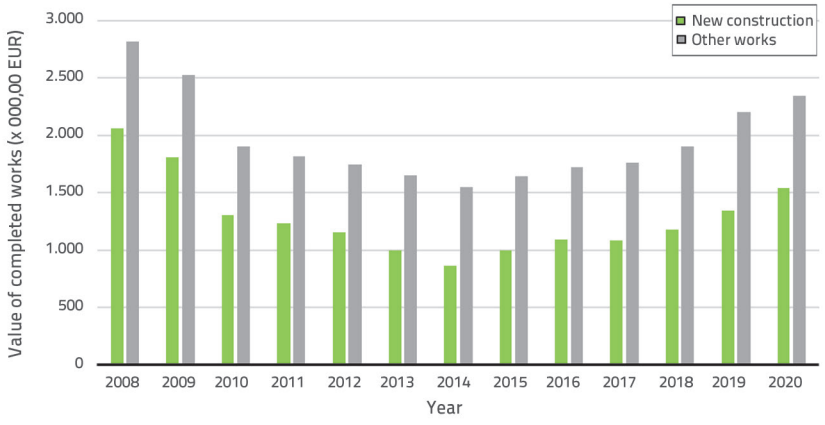

Figure 15. Value of completed works by type of work (source: [5]; author's analysis)

Figures 14 and 15 present the value of completed works by type of buildings and types of works. From Figure 14, it is evident that the value of completed works on buildings follows a "U-shaped" trend, with the lowest point in 2013 (52 % lower) compared to the beginning of the observed period. Since then, there has been a continuous recovery, and in 2020, the value was 17 % lower than in 2008.

On the other hand, the value of works on other buildings, after the first recessionary decline in 2009, has shown "bar-like" three-year periods of recovery (2010–2012, 2014–2016,

Table 4. Indices of construction works (source: [5]; author's analysis)

Year	2008/2007	2009/2008	2010/2009	2011/2010	2012/2011	2013/2012	2014/2013	2015/2014	2016/2015	2017/2016	2018/2017	2019/2018	2020/2019
Value of new orders	94.7	86.4	65.4	106.5	91.6	91.8	100.9	101.3	115	111.5	107.6	120.1	93.1
Value of work performed with own workers	118.3	89.6	73.9	94.6	95.3	93.8	93	107.3	104.7	102.2	108.3	115.4	106.8

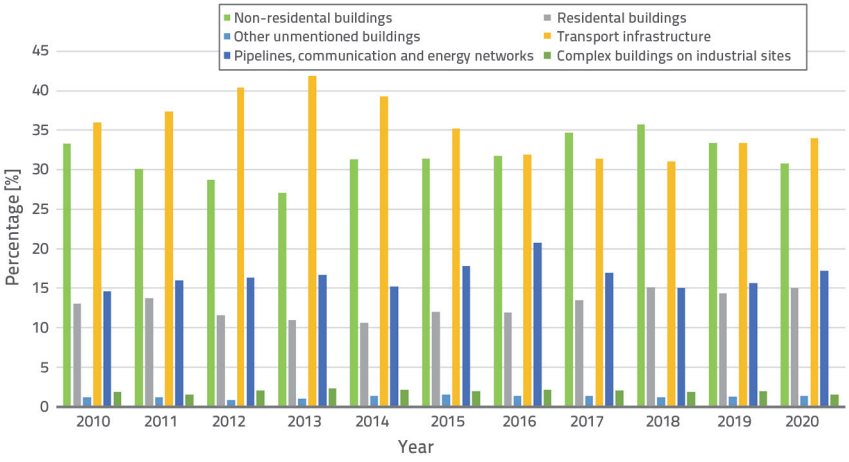

Figure 16. Value of completed works by type of work (source: [5]; author's analysis)

2017–2019), with the current value being only 2 % lower compared to the beginning of the observed period.

Observing Figure 15, a similar "U-shaped" trend can be noticed in the new construction sector, which has been continuously growing since 2014. It is now 25 % lower compared to the value of new construction works in 2008, representing a 10 % increase compared to the previous year, 2019. The value of other executed works has mostly remained stable over the years, following general trends in the construction sector without significant fluctuations, and in 2019, it even recorded a 1 % increase compared to the values from 2008.

Table 5. Building permits issued by year (source: [5]; author's analysis)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of building permits issued													
Total	12.281	11.736	10.087	9.601	8.330	6.687	6.589	6.328	8.018	9.418	9.406	9.932	9.403
Structure by type of building [%]													
Buildings	88.7	87.9	86.5	85.6	80.3	81.2	84.8	81.1	80	82.6	82.9	82.5	83
Other	11.3	12.1	14.5	14.4	19.7	18.8	15.2	18.9	20	17.4	17.1	17.5	17
Structure by type of construction [%]													
New construction	79	79.7	79.8	80.4	79.4	76	72.3	68.3	67.9	70.2	71.9	73.7	75.3
Reconstruction	21	20.3	20.2	19.6	20.6	24	27.7	31.7	32.1	29.8	28.1	26.3	24.7
Estimated value of works. thousand EUR (Data on the value of works are provided based on the cost estimate submitted by the investor along with the application for a building permit.)													
Total	41.389.582	32.201.579	29.636.903	24.356.575	21.269.258	18.671.984	20.208.464	20.865.728	23.312.687	26.016.434	28.428.158	36.915.621	28.090.600
Structure by type of building [%]													
Buildings	56.7	59.9	54.4	59.1	49.2	48.8	49.9	62.6	65.6	71.4	59.2	55	68.8
Other	43.3	40.1	45.6	40.9	50.8	51.2	50.1	37.4	34.4	28.6	40.8	45	31.2
Structure by type of construction [%]													
New construction	83.3	83.4	83.7	80.4	81.3	80.8	75.9	71.1	76.7	65.6	75.3	61.3	74.4
Reconstruction	16.7	16.6	16.3	19.6	18.7	19.2	24.1	28.9	23.3	34.4	24.7	38.7	25.6

Table 6. Number of completed apartments by year (source: [5]; author's analysis)

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Number of apartments	25.368	18.740	14.972	12.390	11.792	10.090	7.805	8.059	7.809	8.496	10.141	11.726	11.957

All the elaborated trends can also be seen in the movement of the construction works index (Table 4), which indicates positive developments in construction activities and the generation of new activities in 2018 and 2019. However, this trend is not observed in 2020, which can primarily be attributed to the onset of the coronavirus pandemic.

Interesting data regarding the sectoral division of the construction industry are presented in Figure 16. The figure shows the percentage shares of each type of construction in the total value of works carried out with in-house workers over the years. Significant deviations are noticeable in the categories of pipelines, communication and energy pipelines; transport infrastructure; and building construction.

The largest share of total works over the years has consistently been in transport infrastructure, which had a significant decrease in 2015 (from 41,9 % to 35,2 %), but has been steadily increasing since 2018, currently accounting for 33,4 %.

Transport infrastructure is followed by works in the construction of non-residential buildings, which have seen a continuous increase in share since 2014, currently standing at 33,4 %, the same as in 2008.

Works in residential construction have seen an increase in share since 2015 and now account for 15 % of all works in Croatia, which is even higher than the share residential construction had before the recession.

The share of the category of pipelines, communication, and energy networks initially fell in 2014, but increased in 2016 and has remained constant since, now accounting for 17.2 % of the total value of works carried out with in-house workers in Croatia.

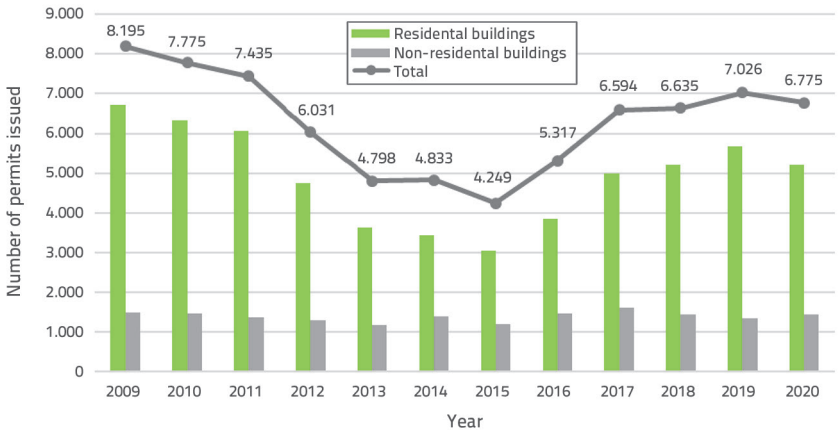

Figure 17. Issued building permits for buildings by year (source: [5]; author's analysis)

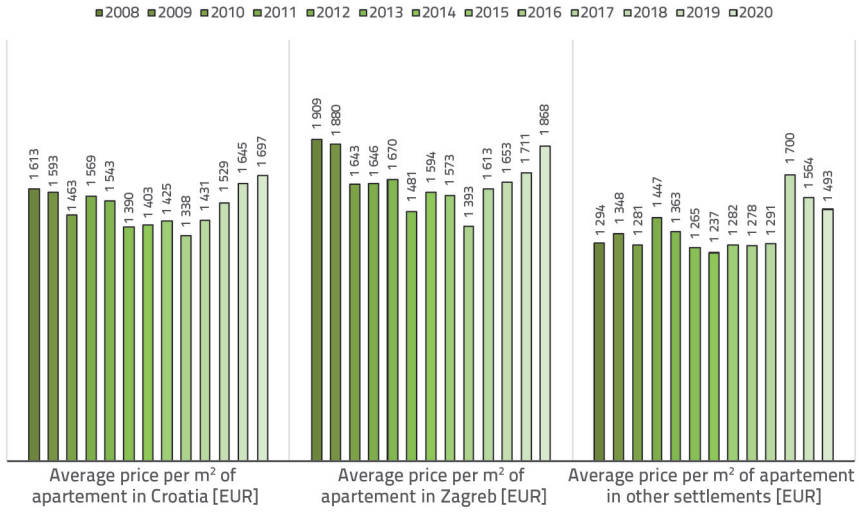

Figure 18. Average price per square meter of apartments by year (source: [5]; author's analysis)

Regarding future market trends and understanding past ones, one of the best indicators is the structure of issued building permits over time (Table 5). In terms of the types of buildings for which construction permits are issued today, the ratio of buildings to other types of construction is 83 : 17 (at the beginning of the observed period, it was 89:11 for buildings). The ratio of new construction to renovations is 75 : 25 (at the beginning of the observed period, this ratio was 79 : 21). In terms of predicted work values, the ratio of buildings to other types of construction is 69:31, and the ratio of new construction to renovations is 74 : 26.

Considering the number of building permits issued for buildings, a noticeable trend of increasing activity in residential construction has been observed since 2016, while the number of permits issued for non-residential buildings has remained relatively stable over the years (Figure 17).

The increase in the number of building permits for residential buildings in the past four years suggests a recovery in the sector, particularly in the area of residential construction. This is also evident from indicators such as the number of completed apartments in a

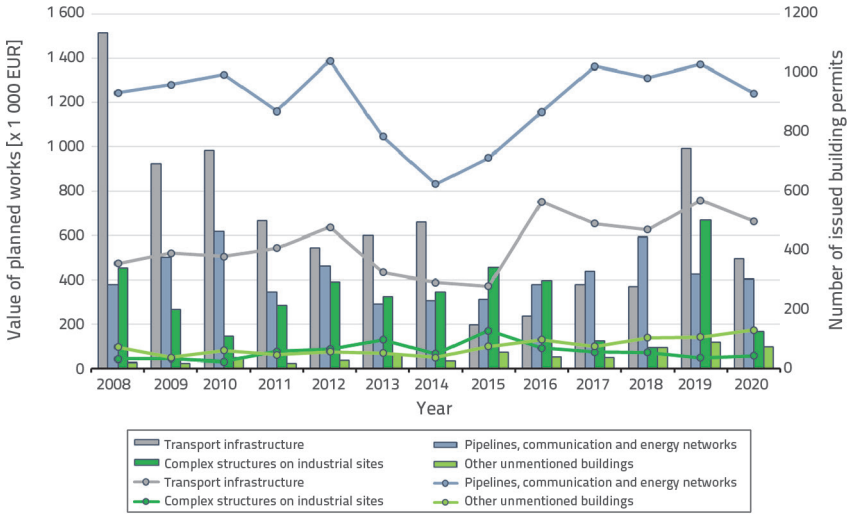

Figure 19. Issued building permits and the value of proposed works based on them for other buildings by year (source: [5]; author's analysis)

given year (Table 6) and the average price per square meter of apartments (Figure 18).

After a certain "boom" in residential construction during the period before the recession, the number of completed apartments has been increasing since 2018, reaching 11.957 in 2020. Simultaneously, the price per square meter has also risen, with prices in the City of Zagreb being 10 % higher than the national average.

Regarding the residential construction market in 2020, it represents the most dynamic year in the real estate market since 2008. The first half of the year marked a semester with the most significant growth in the price per square meter since Croatia's independence. The Real Estate Exchange Index rose by almost 6 % during this period, continuing the trend from 2019, which ended with an annual growth of 9.2 % [15].

The Real Estate Exchange database identifies the following factors as the main drivers of price growth per square meter: low-interest rates on loans subsidized by the state, almost non-existent returns on savings, the low taxation rate on tourist rentals, and state subsidies. Before the market disruption caused by the COVID-19 pandemic, there were indications that the real estate market in 2020 would slow down and gradually shift towards a new market cycle. This shift did partially occur, but it did not manifest as a stagnation or decline in price per square meter. Instead, it was reflected in the reduced purchasing power of buyers and the growing disparity between Investors prices and realized sale prices of residential real estate [15].

The primary driver of rising real estate prices is newly constructed apartments [15]. This is evident from the number of building permits issued and the number of constructed apartments, both of which have been increasing since 2016 (see Tables 5 and 6), alongside the parallel rise in the average price per square meter of apartments (Figure 18).

Regarding other types of structures (Figure 19), the number of permits issued for pipelines, communication, and energy conduits has significantly increased since 2014. In terms of the predicted value of works, this category ranks third, behind transport infrastructure and complex industrial site structures. It is important to note that most investment in new construction today occurs in the category of pipelines, communication, and energy conduits, accounting for 85 % of investments in this category. In contrast, a much higher percentage of work on transport infrastructure (36 %) and work on complex industrial site structures (30 %) involves reconstruction rather than new construction.

5. Trends in prices in construction

Construction is a price-oriented activity. Cost awareness is closely related to price formation, as the price consists of costs and the expected profit for the contractor. The costs of a

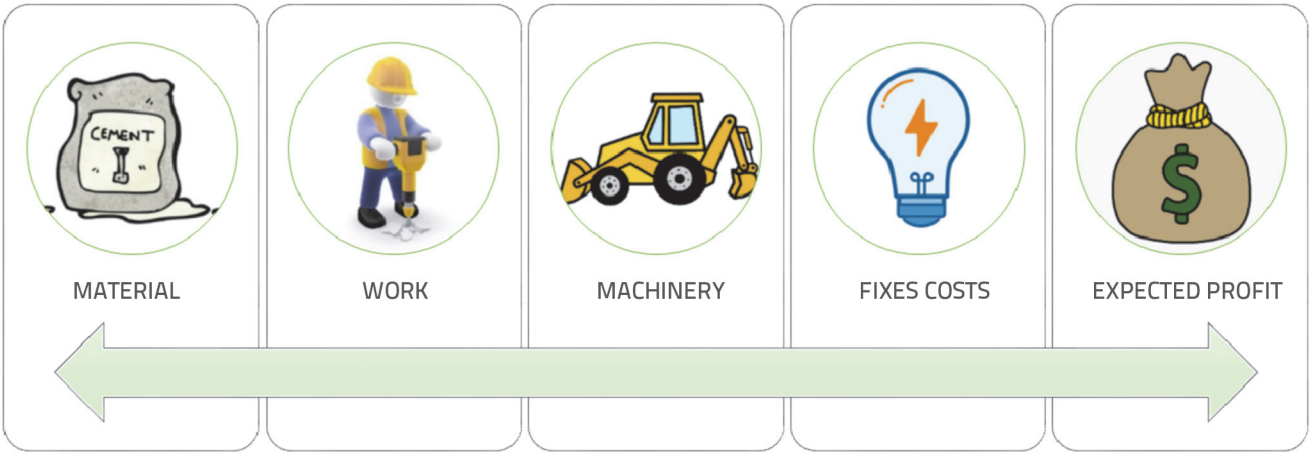

Figure 20. Structure of price of construction

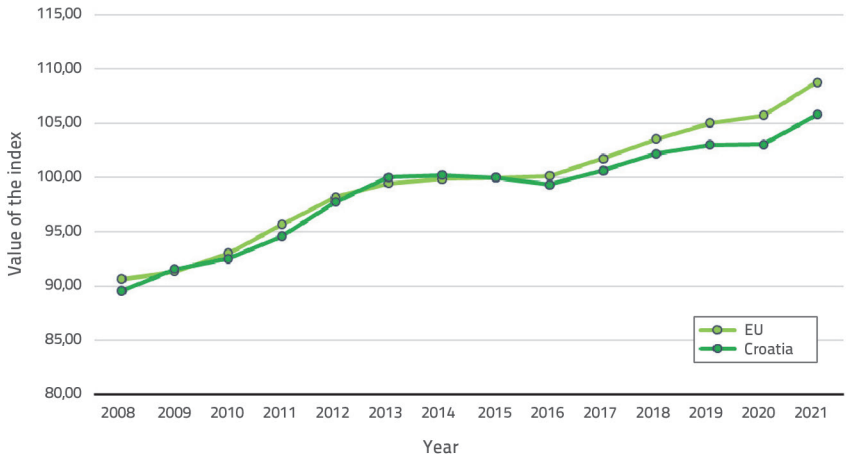

Figure 21. Average annual harmonized consumer price index (source: [6]; author's analysis)

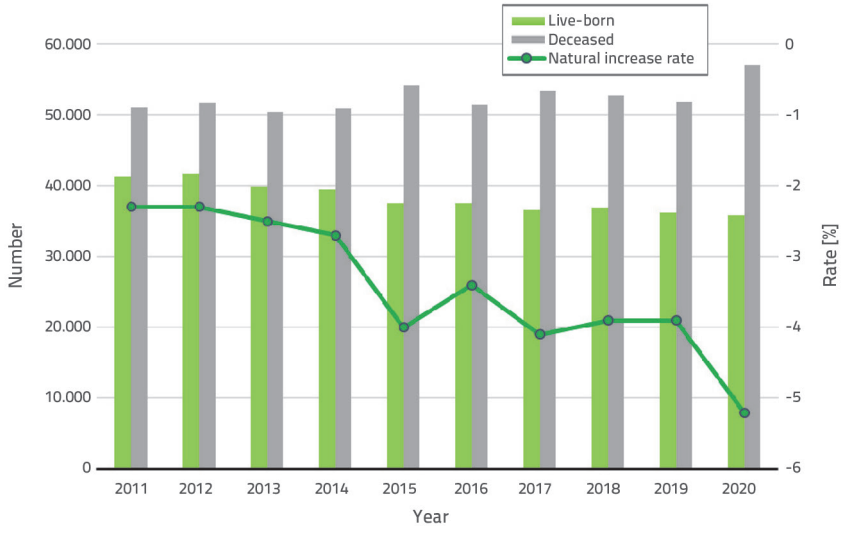

Figure 22. Natural population change (source: [5]; author's analysis)

Figure 23. Population migration (source: [5]; author's analysis)

construction project can be divided into labour costs (workforce), material costs, and equipment costs. Additionally, fixed costs related to the mobilization and operational activities of the construction site must be considered (overhead costs of the site, office spaces and materials, communication tools, and equipment, etc.) [16]. The structure of the price in construction is illustrated in Figure 20.

In addition to direct factors such as material, labour, equipment, and fixed market costs, the cost calculation for construction projects may also depend on general economic and demographic trends.

These trends include inflation, consumer price index fluctuations in the observed period, population changes, and oil prices. Labour costs, for instance, can reflect these trends, as construction projects are often long-term, and the impact of these factors can influence prices during the construction period.

The value of the Harmonized Index of Consumer Prices (HICP) in Croatia followed the European Union average until 2016 (Figure 21), after which the price growth in Croatia slowed down [6]. This suggests that inflation on the national market from 2016 to 2020 was lower than in the rest of the EU. During this period, Croatia had one of the lowest inflation rates (0 to 2 %) not only in the EU but also globally [17]. However, market disruptions caused by the COVID-19 pandemic led to increased inflationary pressures on the construction sector.

Apart from inflation, demographic trends that are closely related to the direct cost factor of construction – labour – were also analysed.

Croatia has had a negative natural population trend for years, with the natural population increase rate dropping significantly in the last observed year (Figure 22). This unfavourable demographic picture has been further worsened by migration trends (Figure 23). Migration also affects productivity, as the decline in migration balance since 2018 has led to an increase in the index of working hours in construction (Table 3).

Between 2010 and 2020, a total of 288,884 people emigrated from Croatia, with fewer people immigrating than emigrating throughout the observed period.

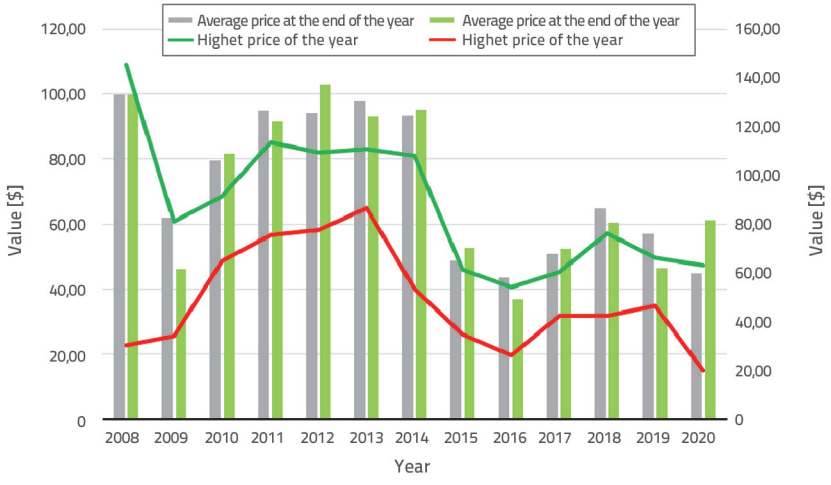

Figure 24. Crude oil prices per barrel (source: [18]; author's analysis)

Unfortunately, the trend of continuous emigration is ongoing, primarily to more developed EU countries (Austria, Germany, Ireland, Italy, and Sweden). This trend has a significant impact on all economic activities, including construction, where 7.6 % of the total employed population works.

The consequences of this were already mentioned in Chapter 3, where the comparison of the number of employed and unemployed people in the sector (Table 2) indicates significant demographic outflow. It is important to emphasize that one-third of the emigrating population is part of the active workforce. Additionally, quotas for imported labour have been increasing since 2016 (Chapter 3). However, these increases are insufficient to meet the sector's labour force needs. As a result, in proportion to the labour force outflow and the reduction of human resources in the sector, it is expected that labour costs will continue to rise, which will, in turn, lead to an increase in construction costs.

Regarding the analysis of price trends for materials and machinery, the movement of crude oil prices per barrel was examined, as oil significantly impacts both material production and machinery operation.

Oil influences the price of materials such as polystyrene and other polymers, which contain oil-based components. It also affects supply chains, as it is directly linked to the cost of transporting materials and operating machinery.

Figure 24 shows that oil prices rose between 2016 and 2018, declined in 2019, and then rose again in 2020. When looking at the average prices at the beginning of the year and comparing 2015 to 2020, the price of oil increased by 40 %. If average prices throughout the year are considered, oil prices increased by 21 % on average over the past five years. This increase is undoubtedly a factor that could drive up construction costs.

Market disruptions in the oil sector caused by the recent situation in Ukraine have led to a significant increase in oil prices. This increase is likely to impact the construction sector as well, especially if a quick stabilization does not occur.

6. Conclusion

This paper provides an overview of the national construction market from 2008 to 2020. It presents the results of an analysis of construction industry indicators over the years, focusing on the sector's relationship with the overall economy, human resources, structural characteristics, and price trends.

In 2008, the Croatian construction sector accounted for a record 6.54 % of the country's GDP. However, the global financial crisis that followed led to a recession in the construction sector that lasted until 2014. Croatia's accession to the European Union and the availability of non-repayable EU funds, coupled with the economy's recovery from the financial crisis, contributed to a significant increase in demand in the construction market from 2016 to 2020. Key construction activity indicators - such as the construction volume index, working hours in construction, construction wages, material prices, and the number of building permits issued - show a continuous increase in economic activity. Despite signs of recovery, the share of the construction sector in Croatia's GDP has not yet reached 2008 levels, while prices have increased significantly.

The analysis of the presented data led the authors to further elaborate on the possible causes of this significant price increase.

The period of lower economic activity from 2009 to 2016 resulted in a significant reduction in the qualified workforce, as workers moved to other sectors or emigrated abroad. The domestic labour pool failed to compensate for this loss, leading to an influx of workers from third-country labour markets. Despite this, the productivity of Croatia's construction sector remains significantly lower than that of other EU countries. The impact of low productivity on prices is particularly evident in civil engineering (infrastructure projects), where the number of employees has stagnated since 2016, even as the share of civil engineering in the total value of completed works increased.

Two possible explanations for this can be identified. The first is that the current workforce structure may be sufficient to meet market demands. The second is that low labour productivity, combined with a shortage of additional skilled labour, has driven up prices, directly affecting the appearance of bids significantly higher than the estimated values in public procurement processes.

The highly dynamic housing construction market also contributes to the price increase in the construction sector. For years, residential construction has seen continuous growth in both business volume and the average price per square meter of residential space. The period before and during the COVID-19 pandemic was marked by low interest rates on savings, making investments in real estate more attractive and increasing market

demand. This trend was seen across the European Union but was even more pronounced in Croatia due to the availability of subsidized housing loans.

Most new employees in the construction sector are hired for the construction of residential and non-residential buildings, indicating the greater attractiveness of this part of the market while negatively impacting other branches of the construction sector. A similar situation is observed in neighbouring countries such as Slovenia, Austria, Hungary, Bulgaria, and Romania [20].

In addition to the causes of price increases already mentioned, key measurable indicators that influence the rise in average offered prices include labour and material costs. From 2015 to 2021, data from Eurostat recorded a consistent increase in construction costs, driven by increases in labour and material prices in the EU-28 member states. All three parameters - construction costs, labour costs, and material costs - rose by approximately 15 % during this period [21].

Notably, an upward trend in lab or and material prices began in 2019-2020, resulting in higher-than-expected bids for public procurement contracts. From 2022, these price increases also began to impact the prices of already contracted works. The key reasons for this are disruptions in global supply chains and inflationary pressures caused by rising energy prices. Inflationary pressures present a major challenge for construction companies, which must estimate project costs months or even years before project completion.

Key indicators in the construction sector suggest that the period of growth is not yet over. Supply chain disruptions caused by the COVID-19 pandemic have further increased labour and material costs, a trend already observed in other European markets [22]. In addition, the current situation in Ukraine is an additional factor contributing to market instability.

A similar situation in the construction sector in other European countries may explain why there has not been a significant influx of foreign companies to absorb excess demand and reduce prices in the Croatian market.

The current market situation provides companies with an opportunity to create capital reserves for a possible scenario similar to the 2014-2018 period.

A combination of all these factors has led to a significant increase in the average offered prices. Considering the planned investments in the coming period, particularly the reconstruction of Zagreb and Banovina, further price increases can be expected if market conditions do not change.

REFERENCES

[1] Lenfernik, S., Tillema, T., Arts, J.: Towards sustainable infrastructure development through integrated contracts: experiences with inclusiveness in Dutch DBFM projects, International Journal of Project Management, 31 (2013) 4, pp. 615-627. doi: 10.1016/j.ijproman.2012.09.014

[2] Birulin, O., Izmalkov, S.: On cost overruns in procurement, 6th Annual Organizational Economics Workshop, Sydney, pp. 1-35, 2012.

[3] Ernst & Young: Analiza kretanja cijena izvođenja građevinskih radova 2015. - 2019., Usluge Tehničke pomoći Upravljačkom tijelu pri upravljanju Operativnim programom „Konkurentnost i kohezija 2014.-2020." i zatvaranju Operativnog programa „Regionalna konkurentnost 2007.-2013.", Zagreb, 2019.

[4] Hrvatska gospodarska komora: Građevinski sektor EU i Hrvatske – od recesije do oporavka, Zagreb, 2016.

[5] Državni zavod za statistiku. Baza podataka. www.dzs.hr, 15.1.2022.

[6] Europska komisija: Europski građevinski sektor – globalni partner, Bruxelles, 2020.

[7] Eurostat. Baza podataka. https://ec.europa.eu/eurostat/data/database, 15.1.2022.

[8] Buturac, G.: Sektorske analize: Građevinarstvo i nekretnine, Ekonomski institut Zagreb, Zagreb, 2019.

[9] Hrvatski zavod za zapošljavanje. Baza podataka. https://statistika.hzz.hr/Default.aspx, 15.1.2022.

[10] Ministarstvo unutarnjih poslova. Baza podataka. https://mup.gov.hr/gradjani-281562/moji-dokumenti-281563/stranci-333/statistika-169019/169019, 15.1.2022.

[11] Zakon o strancima (NN 133/20), Narodne novine – Službeni list Republike Hrvatske, 2020.

[12] Hrvatska gospodarska komora: Pregled osnovnih statističkih podataka u sektoru graditeljstva, Zagreb, 2019.

[13] Digitalna komora HKG. Baza podataka. https://digitalnakomora.hr/home, 15.1.2022.

[14] Odluka o Nacionalnoj klasifikaciji djelatnosti 2007. – NKD 2007. (NN 58/07), Narodne novine – Službeni list Republike Hrvatske, 2020.

[15] Burza nekretnina. Baza podataka. https://www.burza-nekretnina.com/statistike, 15.1.2022.

[16] Peroš, P., Sjekavica Klepo, M., Zekić, E.: Analiza kretanja tržišnih cijena na vodno-komunalnim infrastrukturnim projektima u Hrvatskoj, Aktualna problematika u vodoopskrbi i odvodnji, Bol, Brač, pp. 29-38, 2019.

[17] International Monetary Fund. Baza podataka. https://www.imf.org/external/datamapper/datasets, 15.1.2022.

[18] Macrotrends. Baza podataka. Dostupno na: https://www.macrotrends.net/, 15.1.2022.

[19] Slijepčević, S., Budak, J., Rajh, E.: Challenging Competition at Public Procurement Markets: Are SMEs Too Big to Fail? The Case of BiH and Croatia. Radni materijali EIZ-a, 4 (2015), pp. 5-31. doi: https://hrcak.srce.hr/146969

[20] Europska komisija. Baza podataka: https://ec.europa.eu/growth/sectors/construction/observatory_hr

[21] Europska komisija. Baza podataka: https://ec.europa.eu/eurostat/statistics- explained/index.php?title=Construction_producer_price_and_construction_cost_indices_overview

[22] Deloitte: 2019 Global M&A Construction Monitor, Amsterdam, 2019.