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LIQUIDITY MANAGEMENT IN SMALL AND MEDIUM-SIZED CONSTRUCTION ENTERPRISES DURING CRISIS - THE CASE OF CROATIA

Abstract

Purpose: The aim of this study is to investigate the effects of liquidity management on the profitability of small and medium-sized Croatian enterprises during the economic crisis of 2008 and the crisis caused by COVID-19 and provide empirical evidence of the effects of liquidity management on profitability.

Methodology: The collected data were analyzed using the methods of descriptive statistics, chain and base indices as well as Spearman's correlation coefficient, while the normality of the distribution of the selected sample of small and medium-sized enterprises was examined with the Shapiro-Wilk W test.

Results: According to the research results, the economic crisis in the period from 2008 to 2014 had more pronounced negative effects on liquidity management of the observed companies than the economic crisis in the conditions of the COVID-19 pandemic.

Conclusion: The research results showed that liquidity management and achieving adequate profitability in times of crisis are very important for small and medium-sized construction companies because their total assets are dominated by short-term assets, while short-term liabilities are their dominant source of funding so better education in the field of finance is recommended in order to understand the use of their own and others sources of funding.

Keywords: Economic crisis, COVID-19 crisis, liquidity management, profitability, small and medium-sized construction enterprises

1. Introduction

Economic crises have serious consequences for many economies and business activities of enterprises in all sectors, directly affecting their prof-itability and liquidity. Liquidity is especially important in times of crisis when business activities performed by a company slow down and lower revenues are generated, which is also reflected in cash flows. In addition, companies have a problem

with the conversion of their receivables into liquid assets, which makes it difficult for them to pay their due obligations. Liquidity management and achieving adequate profitability are very important for small and medium-sized enterprises because their total assets are dominated by short-term assets and, as shown in this study, short-term liabilities are the dominant source of funding.

In addition to presenting theoretical knowledge of the economic crisis and the COVID-19 crisis, the main goal of this research is to empirically investigate and analyze the relationship between liquidity management and profitability of Croatian small and medium-sized enterprises in construction during the economic crisis and the COVID-19 crisis.

The construction sector is extremely important for the entire economy as it significantly contributes to gross domestic product through employment and encouraging the development of other activities, among which Bogdan (2020) highlights the construction materials industry, non-metals, wood, furniture and chemical industries. For the last 20 years, the Croatian construction sector has been going through a period of great expansion from 2000 to 2008, a period of recession from 2009 to 2014, and a period of stabilization and the beginning of growth that lasted from 2015 to 2020. In the period from 2000 to 2008, according to the Central Bureau of Statistics, the share of construction in GDP increased from 3.9% in 2000 to 6.5% in 2008. In that period, large infrastructure projects were built in the field of road construction and the residential real estate market grew, which resulted in the growth of construction activity and reflected on the overall economic growth in the country. Most of these activities were financed by expensive borrowing abroad, and as the economic crisis halted the flow of capital, investment activity in the construction sector declined.

During the economic crisis (2008-2014), many construction enterprises stopped operating, so the share of construction in GDP gradually decreased from 6.5% in 2008 to 3.6% in 2014. A gradual recovery started in 2015 and the accelerated growth in 2018, which is also shown by the share of construction in GDP of 4.0% and 4.4% in 2019. The growth trend continued in 2020, when, according to the latest available, although preliminary data, the construction industry had a share of 5.1% in GDP (Croatian Bureau of Statistics, 2021a).

Although, according to data provided by the Croatian Bureau of Statistics, the number of active construction companies increased in the observed period, they recorded a continuous decrease in total revenue from 2008 to 2013. Total revenue has been continuously increasing since 2014.

Both the 2008 economic crisis and the COVID-19 crisis caused a global crisis with global consequences for national economies. Although they have similar proportions, there are some differences between them. Thus, for example, in the Croatian construction sector during the crisis caused by the COVID-19 pandemic, total revenue increased in 2019 and 2020, while during the period of the economic crisis it decreased until 2013. Furthermore, investments were still present in the construction sector in the period of the pandemic, in contrast to the crisis of 2008, when investments were reduced drastically. The reconstruction of the earthquake-affected areas of Zagreb and Banovina will certainly contribute to the growth of the construction sector in Croatia in the coming period.

The research results presented in this paper provide a scientific contribution to economic sciences in a theoretical and applied sense. By studying the available literature, a small number of papers dealing with construction companies were observed, so this research aimed to contribute to this issue. Previous research into the impact of the 2008 economic crisis and the COVID-19 crisis on the operations of construction companies is presented as part of the theoretical scientific contribution. As far as is known, no study has been conducted that would compare liquidity and profitability management of small and medium-sized construction companies during the COVID-19 crisis with the previous economic crisis based on empirical research, which makes a contribution to economic sciences. Previous research on the impact of the COVID-19 crisis or the economic crisis on the business of small and medium-sized enterprises has been mainly conducted through surveys or questionnaires.

After the introduction, the second section presents theoretical assumptions of research on the economic crisis and the COVID-19 crisis, as well as research on determining the relationship between liquidity and profitability of small and medium enterprises in the construction sector. The third section lists research questions, research methodology, and the empirical research results. Finally, the obtained results are synthesized, recommendations

for further research are given, and research limitations are described in the last part of the paper, i.e. the conclusion.

2. Literature review

2.1 Economic crisis

At the end of 2008, the world economy faced a financial crisis that hit financial and national markets through the so-called mortgage or bad credit crisis, which spread to the economies of many countries due to globalization. It has had a number of consequences for economic systems, where economically stronger and more independent countries have recovered much faster from the effects of the crisis. The economic crisis strongly affected the construction industry (Nafday, 2011), which is characterized by a pro-cyclical industry and is moving in line with economic trends. In the construction industry, financing was difficult during the economic crisis and there was a reduction in the construction market and profit margins due to strong competition (Zuo et al., 2015).

Fadhil and Burhan (2021) deal with the effects of the economic crisis on construction projects in Iraq in their study, where they state that contractors extended construction deadlines because they failed to collect their claims from the state due to its illiquidity or incapacity, and Barmpas (2018) points out that illiquidity caused bankruptcy of a large number of construction companies in Greece. Those companies that used their own funds to finance the construction of apartments for the market have previously become illiquid (Barbalić & Dunović, 2015). The volume of construction work in Croatia has been steadily declining since the beginning of the global economic crisis, as large state-funded projects have been absent, and unfavorable labor market developments have caused a decline in real estate demand (Buturac, 2014).

The consequences of the 2008 crisis have long been felt in the construction sector. The first signs of recovery in construction activity in the Republic of Croatia were registered in 2015, and the highest growth rate of construction work since 2008 was recorded in 2018 (Bogdan, 2020). In 2017, there was an increase in construction activities in the sectors of tourism, transport and industry due to the construction of hotels, transport and communication buildings and industrial buildings and warehouses (Buturac, 2018). The 2008 crisis in the construction sector resulted in the disappearance of the largest construction companies, so their large-scale construction work was taken over by foreign companies.

2.2 COVID-19 crisis

The COVID-19 crisis has severely disrupted the economy with devastating effects on global trade, affecting households, businesses, financial institutions and various industries. Unlike the economic crisis that began in the financial sector, the COVID-19 crisis stems from a health crisis and ways to control that pandemic.

The economic effects of the coronavirus pandemic quickly caught the attention of global and domestic economists who investigated the impact of the COVID-19 pandemic, which affected all economies regardless of their size and development (Barua, 2020), and many businesses and individuals around the world by reducing consumption (Baldwin & Mauro, 2020). The crisis caused by the COVID-19 virus has caused increasing uncertainty because there are no close parallels from economic history to compare with (Baker et al., 2020), and has set a precedent in the history of economic crises due to supply and demand shocks in all industries, as well as imposed travel bans inside and outside the country by some countries (Jeffery, 2020).

Based on a survey conducted on 358 respondents from the real sector and public administration, Roška et al. (2021) analyzed the impact of the pandemic on the Croatian economy through a decrease in employment, a decline in GDP and the number of years needed for its recovery. Respondents stated that they expected a reduction in employment in the coming years and that the crisis caused by the COVID-19 pandemic was far more devastating to the economy than the 2008 economic crisis.

There are numerous papers examining the impact of COVID-19 on various economic aspects such as the analysis of the impact on consumption in retail trade (Končar et al., 2020), the analysis of effects on export competitiveness (Stojčić, 2020), and the analysis of the impact of the pandemic on micro, small and medium enterprises in Kenya (Kaberia & Muathe, 2020) or in China (Sun et al., 2021). Numerous studies have also been conducted to examine the impact of the COVID-19 pandemic on the construction industry. The COVID-19 pandemic has had a significant impact on the construc-

tion sector, which is sensitive to economic cycles (Domac, 2020; International Labour Organization, 2021), but which has a lot of potential to foster recovery through employment opportunities (PWC, 2021). Prior to the COVID-19 pandemic, the construction industry needed to increase productivity, improve project performance and find workforce. In addition to the cessation of construction due to restrictions on movement and lack of supply, increased construction costs due to current costs necessary to maintain business were the consequences of the pandemic for the construction sector (Gamil & Alhagar, 2020), which occurred in construction companies in Africa, Asia and Europe (Ogunnusi et al., 2020).

Some authors have compared the impact of the economic crisis and the crisis caused by the COVID-19 virus on the economy. Thus, for example, Li et al. (2021) compared the impact of the crisis caused by the COVID-19 virus and the economic crisis of 2008 on the macroeconomic variables of the US economy. They concluded that structural problems in the US economy pointed to a crisis unlike the crisis caused by the virus COVID-19, which surprised the US economy due to its characteristics, which then limited movements and even closed companies in the first two quarters of 2020 due to extreme contagion.

Santos et al. (2021) conducted a survey on the financing of EU companies during the economic crisis and the COVID-19 crisis, in which the respondents said that their biggest problem during the 2008 economic crisis was access to finance which was followed by finding customers. At the time of the pandemic, their biggest problem was mobility/travel restriction, followed by closure and lack of staff (absence and sick leave) and finding customers, which was also the case during the economic crisis.

2.3 Liquidity and profitability

Maintaining the liquidity of a company and achieving profitable growth are among the most important tasks of management. A company is liquid when it is able to convert its current assets into cash and cash equivalents that should be sufficient to cover its liabilities within one year. The goal of corporate management is to achieve the highest possible profitability and in this context to determine the possibility of the impact of liquidity on profitability.

There is a significant amount of scientific research aimed at determining a correlation between liquidity and profitability. The research focused on a specific industry, a specific geographical area or the company size criterion. For example, Lamberg & Valming (2009) investigated the impact of liquidity and profitability of Swedish small and medium-sized enterprises during the economic crisis and concluded that liquidity has a significant impact on corporate profitability and that more short-term investments can increase profitability.

Furthermore, Saleem & Rehman (2011) examine a correlation between liquidity and profitability and their research results indicate that there is a correlation between a certain amount of liquid assets and the profitability of Pakistani companies in the oil and gas industry, after which keeping liquid assets with a high degree of liquidity negatively affects profitability. Bolek & Wilinski (2012) found in their research that liquidity affects the profitability of construction companies listed on the Warsaw Stock Exchange, and Mamić Sačer et al. (2013) also found a positive correlation between liquidity and profitability in a sample of Croatian medium and large IT companies.

However, unlike the aforementioned research, the results of a number of studies on this issue indicate the existence of a negative correlation between liquidity and profitability of a company. Thus Raykov (2017) investigates the interdependence of liquidity and profitability on a sample of 20 companies listed on the Bulgarian Stock Exchange in the period from 2007 to 2015, where the analysis found a negative correlation between liquidity and profitability. This is also the case in the research conducted by Kontuš & Mihanović (2019) on small and medium enterprises in Croatia, where they found a negative correlation between the level of liquidity measured by the ratio of current assets to current liabilities and profitability measured by return on assets (ROA).

The construction industry has not been researched in a similar way so far, so this paper deals with the area of liquidity and profitability of this branch of activity by comparing the consequences of the COVID-19 crisis with the previous economic crisis.

3. Research

3.1 Methodology and research questions

This part of the paper presents the results of an empirical study conducted on a representative sample of Croatian small and medium enterprises from the construction industry by comparing their liquidity during the crisis caused by the COVID-19 pandemic and the economic crisis. The aim of this paper is to provide empirical evidence of the effects of liquidity management on the level of profitability during the COVID-19 crisis, which refers to the period from 2019 to 2020, and the period of economic crisis from 2008 to 2014 and from 2015 to 2018, in order to determine the possible consequences of the economic crisis on their operations.

After determining the sample of small and medium-sized enterprises in the construction industry (for more details, see 3.1.1), financial data on their operations were collected from the FINA database, the Register of Annual Financial Statements, for all thirteen years: 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020.

The collected data were analyzed using descriptive statistics methods and Spearman's correlation coefficient, while the normality of the distribution of the selected sample of small and medium enterprises was examined by the Shapiro-Wilk W test.

In the empirical analysis, the current liquidity ratio (the ratio of current assets to current liabilities) and the accelerated liquidity ratio (the ratio of current assets less inventories to current liabilities) were used to calculate liquidity. Indebtedness of the company was examined using the indebtedness indicator (the ratio of total liabilities to balance sheet assets), while profitability was examined using the return on assets (ROA) indicator, which is calculated as the ratio of profit after tax to balance sheet assets (Helfert, 1997).

In order to respond to the set goal of the paper, the following research questions were raised:

RQ1: How did the economic crisis in the period from 2008 to 2014 affect liquidity management of selected construction companies?

RQ2: Have the consequences of the economic crisis been felt after 2014??

RQ3: How did the crisis caused by the COVID-19 virus affect liquidity management of selected companies from the construction industry?

RQ4. What conclusions can be drawn from the conducted research?

3.1.1 Sample description

In order to meet the research objectives and answer the research questions, the research is focused on small and medium enterprises from the construction sector of the City of Zagreb and Zagreb County, which form the research sample. The reason for choosing the City of Zagreb is the largest number of active construction companies (4,256), while Zagreb County was chosen because of geographical proximity of the county to the City of Zagreb and because it has 1,317 active companies. These companies make up 33.7% of the total number of active construction companies in the Republic of Croatia (Croatian Bureau of Statistics, 2021b).

The initial sample, which includes 900 small and medium-sized enterprises from the construction industry, was selected from this group at random. After excluding companies that did not submit annual financial statements for each of the observed years in the period from 2008 to 2020, as well as those companies that showed extreme or inconsistent figures in any variable, a final sample of 41 small and medium-sized enterprises was made.

3.2. Empirical analysis results and discussion

3.2.1 Descriptive analysis of construction companies

Based on the information on the operations of the observed small and medium-sized companies in the construction industry for the period from 2008 to 2020, current and accelerated liquidity indicators, indebtedness and return on assets (ROA) indicators, and the share of short-term liabilities in total liabilities of the balance sheet were calculated for each company. The average annual values of the selected indicators of the observed companies were used for further analysis.

Table 1 presents the average annual current and accelerated liquidity indicators, as well as chain and base indices for the observed small and medium-sized companies in the construction industry in the period from 2008 to 2018.

Table 1 Average current and accelerated liquidity indicators, chain and base indices in the period 2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Current liquidity ratio	1.4899	1.8713	1.9570	1.7499	1.5554	1.6784	1.7897	1.7590	2.0228	2.1091	2.0682
Chain index		125.60	104.58	89.42	88.89	107.91	106.63	98.28	115.00	104.27	98.06
Base index (2008=100)	100.00	125.60	131.35	117.45	104.40	112.65	120.12	118.06	135.77	141.56	138.81
Accelerated liquidity ratio	1.3280	1.6059	1.6003	1.5323	1.3325	1.4460	1.5951	1.5590	1.7911	1.9272	1.9045
Chain index		120.93	99.65	95.75	86.96	108.52	110.31	97.74	114.89	107.60	98.82
Base index (2008=100)	100.00	120.93	120.50	115.38	100.34	108.89	120.11	117.39	134.87	145.12	143.41

Source: Authors' calculation

In the period of economic crisis (2008-2014), the average value of current liquidity indicators of the observed small and medium-sized enterprises is less than 2, which indicates their illiquidity. As in the period from 2008 to 2014 the current liquidity ratio was less than 2, and the accelerated liquidity ratio was greater than 1, this indicates poor inventory management, which affects a company's liquidity. A high value of the accelerated liquidity ratio, which is calculated as the ratio of current as-

sets reduced by inventories and short-term liabilities, indicates that companies have on average high amounts of uncollected receivables in the structure of current assets.

Tables 2 and 3 show the average indebtedness indicator and the average share of short-term liabilities in assets, as well as the calculation of chain and base indices of the observed small and medium-sized construction enterprises in the period from 2008 to 2018.

Table 2 Average indebtedness indicator, chain and base indices in the period 2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Indebtedness indicator	0.6698	0.6484	0.6315	0.6921	0.6862	0.6550	0.6098	0.5686	0.5234	0.5155	0.5152
Chain index		96.81	97.39	109.60	99.15	95.45	93.10	93.24	92.05	98.49	99.94
Base index (2008=100)	100.00	96.81	94.28	103.33	102.45	97.79	91.04	84.89	78.14	76.96	76.92

Source: Authors' calculation

Based on the calculation shown in Table 2, it can be seen that during the economic crisis, the observed companies mostly financed their assets from other sources, which can be seen from the calculated average indebtedness indicator ranging from 0.6098 to 0.6921. The highest indebtedness was recorded

in 2011, when 69.21% of total assets were financed from other sources, and it was slightly lower in 2012. In the years after the economic crisis, indebtedness had a decreasing trend, but the average indebtedness indicator was still greater than 0.50.

Table 3 Average share of short-term liabilities in assets, chain and base indices in the period 2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Share of short-term liabilities (%)	61.02	54.19	53.85	61.28	63.54	58.29	53.41	50.15	46.39	45.10	45.56
Chain index		88.81	99.37	113.80	103.69	91.74	91.63	93.90	92.50	97.22	101.02
Base index (2008=100)	100.00	88.81	88.25	100.43	104.13	95.53	87.53	82.19	76.02	73.91	74.66

Source: Authors' calculation

A high share of short-term liabilities in sources of assets indicates the large reliance of small and medium-sized companies on short-term sources of financing, especially in the period from 2008 to 2014, but also in the period from 2015 to 2018.

Table 4 shows the average profitability indicators (ROA), as well as the chain and base indices of the observed small and medium-sized construction companies in the period from 2008 to 2018.

Table 4 Average return on assets (ROA) profitability indicator, chain and base indices in the period 2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
ROA	0.1065	0.0979	0.0699	0.0731	0.0810	0.0725	0.0643	0.0641	0.0916	0.1057	0.0932
Chain index		91.92	71.40	104.58	110.81	89.51	88.69	99.69	142.90	115.39	88.17
Base index (2008=100)	100.00	91.92	65.63	68.64	76.06	68.08	60.38	60.19	86.01	99.25	87.51

Source: Authors' calculation

In the period of economic crisis, the average return on assets (ROA) had a decreasing trend, but it has been increasing since 2016, and in 2017 it was approximately at the level of 2008.

The following table shows an overview of average current and accelerated liquidity indicators, aver-age indebtedness indicators, average return on assets (ROA) indicators, as well as the average share of short-term liabilities in the total liabilities of the balance sheet of small and medium-sized construction companies in 2019-2020.

Table 5 Average indicators of current liquidity, accelerated liquidity, indebtedness and ROA and the average share of short-term liabilities in balance sheet liabilities in the period 2019-2020

	Current liquidity ratio	Accelerated liquidity ratio	Indebtedness indicator	Share of short-term liabilities (%)	ROA indicator
2019	2.1530	2.0095	0.5258	43.37	0.1041
2020	2.4999	2.3296	0.4801	38.06	0.1173

Source: Authors' calculation

According to the average value of current liquidity indicators and the average value of accelerated liquidity indicators, it can be concluded that the observed small and medium companies did not have liquidity problems. But a high average value of accelerated liquidity ratios could potentially indicate problems with inventories or high outstand-ing receivables. In 2019, small and medium-sized enterprises financed 52.58% of their total assets with debts, most of which were short-term liabilities, which was also the case in 2020, except that the average indebtedness indicator was slightly lower, as well as the share of short-term liabilities in balance sheet liabilities. Based on the calculations, it

was determined that the average profitability of the property return indicator increased in 2020 compared to the previous year.

As shown in Figure 1, the research continued by examining the liquidity and profitability of small and medium-sized enterprises in the sample during the period of the economic crisis of 2008 and the COVID-19 crisis.

Figure 1 Comparison of liquidity and profitability during the period of economic crisis and the CO-VID-19 crisis
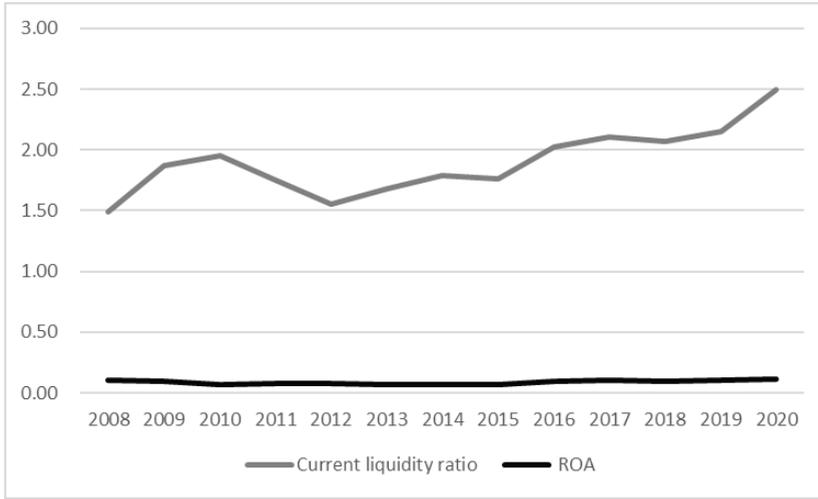
Source: Made by authors

A comparison of the average value of current liquidity indicators at the beginning of the economic crisis and the crisis caused by the pandemic (2020) shows that the observed small and medium enterprises were not liquid at the beginning of the economic crisis, unlike the beginning of the crisis caused by the COVID-19 crisis. Moreover, at the time of the onset of the pandemic, the average value of the ROA profitability indicator was 1.08 percent-age points higher than at the time of the onset of the economic crisis.

Tables 6 and 7 show descriptive statistics of average current and accelerated liquidity indicators, indebtedness and profitability indicators, as well as the share of short-term liabilities in balance sheet liabilities during the economic crisis and the COVID-19 crisis.

Table 6 Descriptive statistics of the observed variables (current liquidity, accelerated liquidity, indebtedness, share of short-term liabilities in balance sheet liabilities and ROA) for the period 2008-2014

	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.	Coef.Var.
Current liquidity ratio	41	1.727369	1.215635	0.475907	4.865366	1.111587	64.35144
Accelerated liquidity ratio	41	1.491436	1.132203	0.066743	4.708903	1.125709	75.47819
Indebtedness indicator	41	0.656128	0.675428	0.196335	0.972979	0.209949	31.99819
Share of short-term liabilities (%)	41	0.579388	0.625193	0.115401	0.972979	0.229417	39.59652
ROA indicator	41	0.080732	0.062586	0.002930	0.299088	0.070586	87.43197

Source: Authors' calculation

Table 7 Descriptive statistics of the observed variables (current liquidity, accelerated liquidity, indebtedness, share of short-term liabilities in balance sheet liabilities and ROA) for the period 2019-2020

	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.	Coef.Var.
Current liquidity ratio	41	2.326443	1.980418	0.771925	6.840467	1.418554	60.97525
Accelerated liquidity ratio	41	2.169539	1.855686	0.100308	6.425824	1.430802	65.94957
Indebtedness indicator	41	0.502928	0.478876	0.138025	0.895904	0.232084	46.14658
Share of short-term liabilities (%)	41	0.407150	0.342055	0.061614	0.895904	0.218896	53.76310
ROA indicator	41	0.110696	0.077666	0.007637	0.380655	0.093897	84.82382

Source: Authors' calculation

3.2.2 Relationship between liquidity level and profitability

The next part of the research is focused on examining the existence of a relationship between the level of liquidity expressed through the ratio of current assets and short-term liabilities, and the profitability expressed in return on assets (ROA). The dependence between average liquidity and average profitability was analyzed by Spearman's correlation coefficient in the observed small and medium companies in the construction sector for each year.

The distribution normality of current liquidity and profitability indicators for each observed year was tested using the Shapiro-Wilk W test as it is a small sample. Since for both indicators in each of the observed periods $p<0.05$, it can be concluded that there is no statistically significant probability that the observed sets have a normal distribution. After testing the distribution normality, the Spearman correlation coefficient was used to analyze the relationship between average liquidity and average profitability.

Table 8 shows the correlation coefficients between the level of liquidity and profitability by year for construction small and medium-sized enterprises during the period from 2008 to 2020.

Table 8 Correlation coefficient between liquidity and profitability level 2008-2020

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
R	0.5700	0.7174	0.5879	0.7219	0.6087	0.5611	0.5221	0.4298	0.4023	0.5631	0.5516	0.5305	0.5307
p	0.0001*	0.0000*	0.0000*	0.0000*	0.0000*	0.0001*	0.0004*	0.0050*	0.0091*	0.0001*	0.0002*	0.0004*	0.0004*

*significant at the level of $p<0.05$
Source: Authors' calculation

The correlation analysis of liquidity and profitability in small and medium-sized enterprises by individual years within the observed period from 2008 to 2020 shows that in each of the observed years there is a statistically significant positive correlation between the observed variables. For most of the observed periods, the Spearman correlation coefficient shows a statistically significant medium-strong positive correlation between the level of liquidity and profitability, which means that an increase in liquidity affects an increase in profitability. Only in the case of 2015 and 2016, a slightly lower correlation coefficient was calculated, which shows a statistically significant weak correlation between the observed variables.

The research also includes examination of the correlation between the level of liquidity and profitability according to the average values of the observed indicators in the period of economic crisis and the COVID-19 crisis, which are shown in tables 10 and 11. The Shapiro-Wilk W test was used to test the normality of the distribution of the selected set, which is shown in Table 9.

Table 9 Shapiro-Wilk W test

	Shapiro-Wilk W	p
Current liquidity ratio 2008-2014	0.81718	0.00001
ROA indicator 2008-2014	0.90070	0.00174
Current liquidity ratio 2019-2020	0.88074	0.00047
ROA indicator 2019-2020	0.87684	0.00037

Source: Authors' calculation

Table 9 shows that, with a significance level of 95%, there is no statistically significant probability that the observed sets have a normal distribution as $p<0.05$ in all four observed sets.

Table 10 Correlation coefficient between the level of liquidity and profitability according to the average values for the period 2008-2014

Pair of variables	Spearman Rank Order Correlations MD pairwise deleted; Marked correlations are significant at p<.05000			
	Valid N	Spearman R	t(N-2)	p-value
TL 08-14 & ROA 08-14	41	0.732578	6.721121	0.000000

*significant at the level of $p<0.05$
Source: Authors' calculation

The calculation of the correlation coefficient between the level of current liquidity and profitability according to the average values of the above indicators for the period from 2008 to 2014 shows that there is a statistically significant medium-strong positive correlation between the observed variables.

Table 11 Correlation coefficient between liquidity and profitability levels according to average values in the period 2019-2020

Pair of variables	Spearman Rank Order Correlations MD pairwise deleted; Marked correlations are significant at p<.05000			
	Valid N	Spearman R	t(N-2)	p-value
TL 19-20 & ROA 19-20	41	0.589547	4.558085	0.000050

*significant at the level of $p<0.05$
Source: Authors' calculation

The calculation of the correlation coefficient between the level of current liquidity and profitability according to the average values of these indicators for the period from 2019 to 2020 shows that there is a statistically significant medium-strong positive correlation between the observed variables.

4. Conclusion

The primary purpose of this study was to analyze liquidity management of Croatian small and medium-sized companies in the construction industry during the 2008 economic crisis and the crisis caused by the COVID-19 pandemic. According to

the results of the research, it was determined that the economic crisis in the period from 2008 to 2014 had more pronounced negative effects on liquidity management of the observed companies than the economic crisis in the conditions of the COVID-19 pandemic. Recovery of small and medium-sized construction companies after the economic crisis has been going on since 2015, when their liquidity and profitability increased, while indebtedness and short-term debt, which is still high, decreased.

Throughout the analyzed period, a high average value of the accelerated liquidity ratio was observed, which potentially indicates high values of uncollected receivables in the structure of current assets. The study also found high inventory values that were higher during the 2008 economic crisis than during the pandemic. Better inventory and receivables management would allow companies to improve their liquidity because they could then meet their obligations on time. Comparing the average indicators of return on assets (ROA) in the period of economic crisis and pandemic, it can be seen that in the period of economic crisis there was a decreasing trend, while an increasing trend was recorded in the period of pandemic. Greater negative effects of the economic crisis on the operations of small and medium-sized construction companies can also be seen in their indebtedness, because in the period of economic crisis the total indebtedness was greater than in the pandemic period, as well as financing assets from short-term sources.

The research results presented in this paper will be useful to small and medium enterprises in Croatia in terms of a better understanding of the importance of liquidity management, which is especially evident in times of crisis.

Research limitations: The limitation existed at the time of data collection because small and medium-sized enterprises were obliged to submit financial reports to FINA only since 2008, so it was not possible to conduct analysis in the year before the economic crisis. Furthermore, small enterprises submit to FINA condensed financial statements that are less elaborate and have less data than the financial statements of medium and large enterprises, which was a limitation to a more detailed analysis. A potential limitation of the research is the use of average annual values of indicators for the observed companies, which can affect the reliability of the results.

Research recommendations: Future research on the impact of the crisis on liquidity management of small and medium-sized enterprises in the construction industry should expand the theoretical framework on the COVID-19 crisis, as it is assumed that there will be more work on the impact of the COVID-19 crisis on business operations. Furthermore, given that research on the impact of the COVID-19 crisis is conducted on a short-term series, and the pandemic is still ongoing, longer time series should be considered. In addition, this paper initiates further research on the impact of the crisis on the operations of small and medium-sized enterprises in other industries, as well as the expansion of research to other Croatian regions. This research has also shown that small and medium enterprises mostly finance their assets from short-term sources, so better education in the field of finance is recommended for them in order to understand the use of their own and other sources of financing.

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