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THE IMPACT OF COVID-19 ON LIQUIDITY MANAGEMENT IN SMALL AND MEDIUM-SIZED TRADE BUSINESSES: THE CROATIAN CASE

ABSTRACT

Purpose: The aim of this paper is to examine empirically the relationship between liquidity management and profitability of Croatian small and medium enterprises in trade and to provide empirical evidence of the effects of liquidity management on the level of profitability during the COVID-19 crisis.

Methodology: The analysis began with descriptive statistics, where the authors observed the following variables: ROA, current liquidity, accelerated liquidity, immediate liquidity and employment. The collected data analyzed descriptive statistics and compared the Wilcoxon signed-rank test. The authors made six regression models and performed regression diagnostics for all models. The problem of heteroscedasticity examined the Breusch-Pagan test, the normality of relation errors examined the Jarque-Bera test, while multi-collinearity examined the variance inflation factor (VIF).

Results: All six models confirmed a statistically significant and positive impact of liquidity on the level of profitability in both years, which means that the increase in liquidity will result in an increase in the level of profitability of the observed companies. Control variables of company size and trade category did not prove statistically significant.

Conclusion: Scientific contribution is the development of a model for the analysis of the impact of liquidity on the profitability for small and medium enterprises in trade. The model is also applicable to similar transition and post-transition economies, especially to those in the region that have similar economic development as it will help economic policy makers and corporate managers understand the importance of the impact of liquidity on profitability levels.

Keywords: Liquidity management, profitability, COVID-19, Croatian small and medium enterprises, trade

1. Introduction

The health crisis caused by the COVID-19 coronavirus in 2020 occurred at a rapid pace causing a deep decline in economic activity and at the same time affecting the entire world. Croatia should have adapted to the new situation in the short term because it has a small open economy that is highly dependent on tourism and tourism-related activities such as accommodation and food preparation and serving, retail trade, production and others.

Wholesale and retail trade, according to the CBS data on 31 December 2020, had a share of 16.7% in gross value added, 16.7% in employment of legal entities, and 20.3% in the number of active legal entities (Croatian Bureau of Statistics, 2021), while its share in the total profit of all activities was 35% (FINA, 2021). Its importance to the economy is that it affects both production and consumption because of the intermediary role it plays in the value chain.

Small and medium-sized enterprises are the backbone of economic growth both due to the number of registered enterprises and due to the fact that they create a significant number of jobs. Their share in the total number of companies has been 99.7% for decades. According to FINA data, in 2020 the number of small and medium-sized enterprises in Croatia increased by 2.3% compared to 2019, which indicates that workers who lost their jobs started their own enterprises. This confirmed the increase in the number of employees in micro enterprises by 6.6% compared to the previous year, while the number of employees in small enterprises decreased by 2.9% and in medium enterprises by 3.7% compared to 2019. The net profit for the period decreased in micro enterprises by 46.5%, in small enterprises by 9.3%, and in medium-sized enterprises by as much as 32.3% compared to the previous year.

Small and medium-sized enterprises affected by the crisis were hardest hit due to their low levels of capital and working capital. Companies can operate without profit in the short term, but in case of illiquidity, they are quickly doomed to bankruptcy. Liquidity is becoming a priority in pandemic conditions, which one can see in the measures adopted by the Government, which has prepared measures to mitigate the pandemic for small and medium enterprises.

The COVID-19 pandemic has had serious consequences for many economies and the operations of

companies from all sectors, directly affecting their profitability and liquidity. Liquidity is important for ensuring business continuity, especially during the COVID-19 pandemic, when the company's business activities have slowed down and lower revenues have been generated, which is also reflected in cash flows. The main objective of this study is to examine the relationship between liquidity and profitability management of Croatian small and medium-sized enterprises in trade in an environment typical of transition countries, and to provide empirical evidence of the effects of liquidity management on profitability at the time of the pandemic.

The research results in this paper make a scientific contribution in theoretical and applied terms to the economic sciences. The contribution of the research is in presenting the current knowledge of the impact of the crisis caused by the COVID-19 virus on the business of small and medium enterprises in trade as well as in the empirical research on a selected sample of companies to determine their liquidity during the pandemic. This paper also develops a model for analyzing the impact of liquidity and profitability of small and medium enterprises in the trade sector, which can help corporate managers understand the importance of liquidity management, which is especially important in times of crisis.

The paper is structured such that after the introduction it presents the theoretical assumptions of the research in Chapter 2, while Chapter 3 describes the research methodology, defined by the sample, and gives the results of empirical research. The concluding chapter synthesizes the obtained results, gives recommendations for further research and describes the research limitations.

2. Theoretical settings

2.1 COVID-19 pandemic

The economic effects of the coronavirus pandemic quickly caught the attention of global and domestic economists who analyzed the impact of the COVID-19 pandemic, the worst global recession since 1930 (Shen et al., 2020) that affected all economies (Carracedo et al., 2020) regardless of their size and development (Barua, 2020) and that significantly reduced GDP in the major economies of OECD countries in the first two quarters of 2020 (OECD, 2021). This crisis, which began as a health crisis, came abruptly, caused an unexpected decline in all

economic activities in all areas globally, and had an impact on various aspects of human life as well.

The impact of the pandemic on the business of small and medium enterprises is the subject of research by many authors in different countries. Thus, for example, Kaberia & Muathe (2020) in Kenya, Sun et al. (2021) in China or Aladejebi (2021) in Nigeria found a negative impact on their businesses. Revoltella et al. (2020) found that small and medium-sized enterprises in the European Union have higher income reductions than large enterprises, as is the case in less developed countries (World Trade Organization, 2021). Declining revenues affect their liquidity and require government assistance (Ikmal et al., 2020; Iancu et al., 2022) because without government assistance, far more companies would have poorer business results (Gourinchas et al., 2022). State aid can significantly reduce the negative impact of a pandemic on liquidity as they lack financial resources at the time of the pandemic (Eggers, 2020; Dimson et al., 2020).

In order to limit the spread of the pandemic, most countries have prescribed a reduction in or a complete ban on contacts, which has mostly affected small and medium enterprises in the service sector such as tourism and catering and in activities closely related thereto such as shops, restaurants, small family hotels, passenger transport (Čučković, 2020; OECD, 2021; Fernandes, 2020). In the first period and in the short term, the trade and services sector was most affected (Arčabić, 2020).

The economic impact of the pandemic can be seen in all sectors, but is particularly visible in the consumer goods sector due to changing consumer habits (Dertouzos et al., 2020; Becdach et al., 2020), but also increased demand for certain products (Becdach et al., 2020). Carnevale & Hatak (2020) conclude that the pandemic has forced customers to use the Internet in their daily routine and that there has been a significant increase in online sales (Becdach et al., 2020).

There are numerous papers examining the impact of COVID-19 on various economic aspects such as, for example, the analysis of the impact on the tourism sector (Škare et al., 2021; Čorak et al., 2020), on export competitiveness (Stojčić, 2020), on the construction sector (Gamil & Alhagar, 2020), and somewhat fewer papers analyzing the impact of COVID-19 on trade (Knezović, 2021; Končar et al., 2020; Tighe, 2021; Pantano & Willems, 2022).

According to the Croatian Bureau of Statistics (2021) data, Croatia's real annual retail trade turnover has been falling continuously since March 2020, and fell by 5.8% compared to the previous year, on an annual basis. At the same time, the turnover from retail trade in food and beverages increased by 4.7%, while the turnover from trade in non-food products decreased by 5.5%. The biggest drop was recorded in retail trade in textiles, footwear and clothing, which fell by as much as 50%.

Tighe (2021a) researched small and medium-sized enterprises in the US wholesale business and found that about 25% of companies achieved a negative business result, while in retail trade, for example, spending on food and household supplies has continued to increase, while spending on clothing and jewelry has been drastically reduced (Tighe, 2021b).

Restrictions on movement and forced closure of stores have affected changes in consumer behavior since they have decided to buy products online. The pandemic accelerated investments in the digitalization of trade (Knezović, 2021; Pantano & Willems, 2022). Končar et al. (2020) found in their study that in the Western Balkans, the share of online retail revenue in total revenue increased significantly during the pandemic period.

2.2 Liquidity and profitability

Maintaining the company's liquidity and achieving a profitable business are the most important tasks of company 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.

Management of short-term assets and short-term liabilities is important for the company's operations in order for the business process to run smoothly and to avoid the risk of default. This is especially important for those companies that have a higher share of current assets in the balance sheet assets and whose sources of financing assets are short-term liabilities. The goal of the company 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 opus of scientific research in an attempt to determine the relationship between liquidity and profitability. Research was usually focused on the criterion of enterprise size (a small, medium or large enterprise), a specific geographi-

cal area or a specific activity. Thus, for example, Tušek et al. (2014) examined the impact of liquidity and profitability of large and medium-sized enterprises in the hotel industry in Croatia. The results of their research show that there is no significant correlation between liquidity and profitability.

Mamić Sačer et al. (2013) analyzed the impact of liquidity on the profitability of medium-sized and large enterprises in the information and communication industry and found that increasing the value of the current liquidity ratio affects the increase in the gross return on assets ratio. A positive link between liquidity and profitability of Portuguese small and medium-sized enterprises in service industries was also found by Nunes et al. (2010).

The trade sector has also been the subject of research related to the correlation between liquidity and profitability. Thus, for example, Lee & Song (2010) examine in their research the impact of liquidity measured by the money conversion cycle and the profitability of Korean wholesale and retail companies. Their results suggest a negative link between the money conversion cycle and net profit, as well as the money conversion cycle and return on assets (ROA).

Furthermore, the Svitlik & Poutnik (2016) study also addresses the issue of the relationship between liquidity and profitability in the Czech Republic and their results indicate a strong link between working capital and return on assets (ROA) in wholesale and retail trade. Research on liquidity and profitability of trade companies in Jordan was conducted by Al-Qadi & Khanji (2018). Their results indicate a significant impact of liquidity measured by the current and accelerated liquidity ratio on profitability through return on assets (ROA).

3. Research

3.1 Methodology

The research in this paper aimed at gaining insight into liquidity management of Croatian small and medium enterprises in the trade sector in the period 2019 to 2020. Empirical research focuses on the analysis of liquidity in selected SMEs in order to determine the relationship between their liquidity and profitability. According to the data available on the FINA website, in 2020 the total number of Croatian

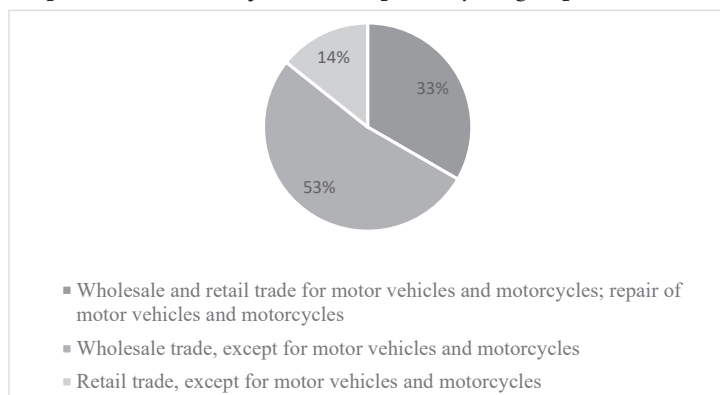
small and medium-sized enterprises increased by 2.3% compared to 2019. The largest increase was recorded in trade, which participates in total activities with 21.2%. In the classification of economic activities, researchers used the National Classification of Activities 2007 - NKD 20072, which is harmonized with European standards, i.e., it corresponds to the NACE Rev.2 classification.

The data used in the survey were collected from FINA, to which SMEs are required to submit their financial statements on an annual basis and which meet the definition of SMEs applied by the European Commission. According to this definition, the sample includes companies that have less than 250 employees, an annual turnover of up to EUR 50m and/or total assets of up to EUR 43m.

Small and medium-sized enterprises in the trade sector in the Central Croatia region were selected for the sample [since the term Central Croatia does not have a clearly defined line of demarcation, it often coincides with the term Northern Croatia], which includes the following counties: Bjelovar-Bilogora County, the City of Zagreb, Karlovac County, Sisak-Moslavina County and Zagreb County, in which 45% of all small and medium enterprises operating in the Republic of Croatia are registered. As trade activity is the most represented in the total activities, the initial sample of 101 micro, small, and medium-sized enterprises in trade activity was selected randomly according to the criterion of the size of the enterprise. Companies that showed extreme or inconsistent figures in any variable were not included in the sample, so that the **final sample consists of 63 micro, small and medium enterprises.**

The sample of trade enterprises from the Republic of Croatia in 2019 and 2020 was divided into three subgroups (according to the NKD 2007 sections). The categories of subgroups comprised 22 enterprises in wholesale and retail trade for motor vehicles and motorcycles; repair of motor vehicles and motorcycles, 32 in wholesale trade, except of motor vehicles and motorcycles, and nine in retail trade, except of motor vehicles and motorcycles. Their distribution is shown in the following graph.

Graph 1 Presentation of trade enterprises by subgroups



Source: Authors

The collected data were analyzed by descriptive statistics and compared using the Wilcoxon signed-rank test. The authors made six regression models and performed regression diagnostics for all models. The problem of heteroscedasticity, the normality of relation errors, and multi-collinearity were examined by the Breusch-Pagan test, the Jarque-Bera test, and the variance inflation factor (VIF), respectively. The authors analyzed the data using the Stata 14.2 software tool.

3.2 Results of empirical analysis and discussion

3.2.1 Descriptive statistics

The analysis began with descriptive statistics, where the authors observed the following variables: ROA, current liquidity, accelerated liquidity, immediate liquidity and employment. Descriptive statistics of the observed variables are presented in Table 1 for 2019, and in Table 2 for 2020.

Table 1 Descriptive statistics for 2019

2019	ROA	Current liquidity	Accelerated liquidity	Immediate liquidity	Employment
average	0.0847	1.9865	0.9471	0.2782	41.7143
standard deviation	0.0619	1.3657	0.7968	0.3887	45.5467
coefficient of variation	73.10 %	68.75 %	84.13 %	139.74 %	109.19 %
maximum	0.2403	6.4701	4.2336	2.0791	245.0000
median	0.0593	1.5499	0.7138	0.0994	35.0000
minimum	0.0077	0.2620	0.1378	0.0019	1.0000

Source: Authors' calculation

Table 2 Descriptive statistics for 2020

2020	ROA	Current liquidity	Accelerated liquidity	Immediate liquidity	Employment
average	0.0936	2.0239	1.0939	0.3824	41.6984
standard deviation	0.0727	1.2711	0.9774	0.5228	44.7721
coefficient of variation	77.66 %	62.81 %	89.35 %	136.71 %	107.37 %
maximum	0.2805	7.0534	4.7931	2.2655	245.0000
median	0.0758	1.6175	0.7198	0.1550	35.0000
minimum	0.0046	0.2731	0.1188	0.0008	1.0000

Source: Authors' calculation

Based on the data given in Tables 1 and 2, it can be seen that within the selected sample of micro, small and medium enterprises there are enterprises with a wide range of observed values, which is shown by a coefficient of variation that shows a higher degree of dispersion in 2020's ROA and accelerated liquidity, and a smaller degree of dispersion in current liquidity as well as in employment.

The authors compared data for ROA, current liquidity, accelerated liquidity and immediate liquidity in 2019 and 2020 for all trades together using

the Wilcoxon signed-rank test, where the following hypotheses were tested:

H0: There was no change in ROA/current liquidity/accelerated liquidity/immediate liquidity in 2020 compared to 2019.

H1: There was a change in ROA/current liquidity/accelerated liquidity/immediate liquidity in 2020 compared to 2019.

The average values of the observed variables and the corresponding p-values are given in Table 3.

Table 3 Average values of the observed variables for all trades and the corresponding p-values

	2019	2020	p
ROA	0.0847	0.0936	0.2309
Current liquidity	1.9865	2.0239	0.0234*
Accelerated liquidity	0.9471	1.0939	0.0031*
Immediate liquidity	0.2782	0.3824	0.0031*

*significant at the $p < 0.05$ level

Source: Authors' calculation

The analysis showed that compared to 2019, there was a statistically significant increase in current liquidity, accelerated liquidity and immediate liquidity in 2020. ROA was slightly higher in 2020 compared to 2019, but that difference is not statistically significant.

Enterprises in motor vehicle trade activity, which are shown in Table 4, were also analyzed separately, as well as enterprises in non-motorized vehicle activity, which are shown in Table 5.

Table 4 Average values of observed variables and corresponding p-values for wholesale and retail trade of motor vehicles and motorcycles; repair of motor vehicles and motorcycles

	2019	2020	p
ROA	0.0747	0.0705	0.9308
Current liquidity	1.5551	1.6500	0.0078*
Accelerated liquidity	0.5495	0.6708	0.0173*
Immediate liquidity	0.1377	0.2524	0.0228*

*significant at the $p < 0.05$ level

Source: Authors' calculation

Based on the data from the table, it can be noticed that there was a statistically significant increase in all three liquidities, i.e., current, accelerated and immediate liquidity, while the change in ROA was not statistically significant.

Table 5 shows average values and p-values for the wholesale trade category, except of trade in motor vehicles and motorcycles, and the retail trade category, except of trade in motor vehicles and motorcycles, analyzed separately.

Table 5 Average values of observed variables and corresponding p-values for wholesale and retail trade, except of motor vehicle trade

	2019	2020	p
ROA	0.0897	0.1052	0.1384
Current liquidity	2.2022	2.2108	0.2526
Accelerated liquidity	1.1460	1.3055	0.0362*
Immediate liquidity	0.3484	0.4474	0.0409*

*significant at the $p < 0.05$ level

Source: Authors' calculation

There was a statistically significant increase in accelerated liquidity and immediate liquidity, while changes in ROA and current liquidity were not statistically significant.

3.2.2 Regression models

A regression technique was used in further research into the dependence between variables to see where the dependent variable is profitable; the independent variables are current liquidity, accelerated liquidity and immediate liquidity, while the control variables are company size and the division of trade (section G) into sections G45, G46 and G47.

Return on assets (ROA) (Garcia-Teruel & Martinez-Solano, 2007) is used as a measure of profitability, which is calculated as the ratio of earnings before interest and taxes (EBIT) and total assets and shows how much is earned independently of the method of financing.

Current liquidity is calculated as the ratio of current assets to short-term liabilities, accelerated liquidity as the ratio of cash and receivables to short-term liabilities, and immediate liquidity as the ratio of cash to short-term liabilities.

The first control variable of firm size is expressed as the natural logarithm of the number of employees (according to Deloof, 2003; Raheman & Nasr, 2007; and others). One expects that the growth of company size will affect the profitability of companies, primarily because large companies find it easier to acquire capital in the financial market, while small companies are primarily oriented to internal sources of financing. For example, Deloof (2003), Raheman & Nasr (2007), and Garcia-Teruel & Martinez-Solano (2007) found a positive relationship between profitability and firm size, Enqvist et al. (2014) identified a negative correlation, while Wesley et al. (2013) did not get any significant relationship between firm size and profitability.

The second control variable is the category, i.e., a division of trade into subgroups. The trade sector (section G according to the NKD 2007) is divided into the following three sections (subgroups): wholesale and retail trade of motor vehicles and motorcycles; repair of motor vehicles and motorcycles (division 45), wholesale trade, except of motor vehicles and motorcycles (division 46), and retail trade, except of motor vehicles and motorcycles (division 47), which differ in the duration of a business cycle.

Six regression models were developed, in which the impact of three types of liquidity on ROA was observed for 2019 and 2020.

The following defines control variables:

- company size (the logarithm of the number of employees),
- a dummy variable category *Wholesale*, where the basic category wholesale and retail trade of motor vehicles and motorcycles; repair of motor vehicles and motorcycles, was assigned the value of 0, while the category wholesale, except of trade in motor vehicles and motorcycles, was assigned the value of 1,
- a dummy variable category *Retail*, where the basic category wholesale and retail trade of motor vehicles and motorcycles; repair of motor vehicles and motorcycles, was assigned the value of 0, while the category of retail trade, except of trade in motor vehicles and motorcycles, was assigned the value of 1.

Since all observed variables were positively asymmetric for the models, they used their logarithmic values. A list of all variables and abbreviations are given in the following table:

Table 6 List of variables with full names and abbreviations

Variable	Abbreviation
ROA (return on asset)	ROA
Current liquidity logarithm	L_TEKL
Accelerated liquidity logarithm	L_UL
Immediate liquidity logarithm	L_TRENL
Number of employees logarithm	L_ZAP
Wholesale category	K_VEL
Retail category	K_MAL

Source: Authors

Table 7 provides an overview of regression models analyzed in the paper with the dependent and independent variables indicated.

Table 7 Overview of the model with the independent and dependent variables indicated

Model	Independent variable	Dependent variable
01	Current liquidity 2019	ROA 2019
02	Accelerated liquidity 2019	ROA 2019
03	Immediate liquidity 2019	ROA 2019
04	Current liquidity 2020	ROA 2020
05	Accelerated liquidity 2020	ROA 2020
06	Immediate liquidity 2020	ROA 2020

Source: Authors

Six regression models were developed for the impact of liquidity on profitability. The first three regression models refer to the impact of current and accelerated liquidity on ROA in 2019 (tables 8-10), while the other three regression models relate to the impact of current and accelerated liquidity on ROA in 2020 (tables 11-13).

The results of the impact of current liquidity on ROA in 2019 are given in Table 8.

Table 8 Regression model 1

Variable	Coefficient	Standard error	p-value
L_TEKL*	0.4588	0.1504	0.003
L_ZAP	-0.0303	0.0927	0.745
K_VEL	-0.1137	0.1099	0.305
K_MAL	0.1278	0.1379	0.358
CONST*	-1.2145	0.1714	0.000

*significant at the $p < 0.05$ level

Source: Authors

Current liquidity and the constant are statistically significant, while employment and the trade category did not affect ROA in 2019. Trade companies that had higher current liquidity also had a higher ROA.

The results of the impact of accelerated liquidity on ROA in 2019 are given in Table 9.

Table 9 Regression model 2

Variable	Coefficient	Standard error	p-value
L_UL*	0.4176	0.1405	0.004
L_ZAP	-0.0155	0.0929	0.868
K_VEL	-0.1859	0.1163	0.115
K_MAL	0.0362	0.1470	0.806
CONST*	-1.0249	0.1790	0.000

*significant at the $p < 0.05$ level

Source: Authors

Accelerated liquidity and the constant are statistically significant, while employment and the trade category are not statistically significant for ROA in 2019. Trade companies that had higher accelerated liquidity also had a higher ROA.

The results of the impact of current liquidity on ROA in 2019 are given in Table 10.

Table 10 Regression model 3

Variable	Coefficient	Standard error	p-value
L_TRENL*	0.2510	0.0623	0.000
L_ZAP	-0.0025	0.0882	0.977
K_VEL	-0.1182	0.1043	0.262
K_MAL	0.0281	0.1362	0.837
CONST*	-0.8957	0.1771	0.000

*significant at the $p < 0.05$ level

Source: Authors

Companies that had higher current liquidity also had a higher ROA in 2019. Other variables, with the exception of the constant, were not statistically significant.

The results of the impact of current liquidity on ROA in 2020 are given in Table 11.

Table 11 Regression model 4

Variable	Coefficient	Standard error	p-value
L_TEKL*	0.4243	0.1930	0.032
L_ZAP	0.0929	0.1048	0.379
K_VEL	0.0118	0.1297	0.928
K_MAL	0.1809	0.1610	0.266
CONST*	-1.4401	0.1962	0.000

*significant at the $p < 0.05$ level

Source: Authors

Companies that had higher current liquidity also had a higher ROA in 2020. Employment and the trade category had no impact on ROA.

The results of the impact of accelerated liquidity on ROA in 2020 are given in Table 12.

Table 14 Regression diagnostics for all models

Model	01	02	03	04	05	06
Prob > F	0.0159	0.0190	0.0013	0.0846	0.0514	0.0706
R ²	0.1869	0.1811	0.2627	0.1298	0.1476	0.1364
Adj. R ²	0.1308	0.1247	0.2119	0.0698	0.0888	0.0768
Breusch-Pagan	0.2209	0.4210	0.1332	0.9707	0.7678	0.8517
Jarque-Bera	0.6074	0.6501	0.4153	0.2732	0.1423	0.1542

Source: Authors' calculation

Table 12 Regression model 5

Variable	Coefficient	Standard error	p-value
L_UL*	0.3737	0.1507	0.016
L_ZAP	0.1023	0.1034	0.327
K_VEL	0.0508	0.1339	0.706
K_MAL	0.0833	0.1688	0.623
CONST*	-1.2688	0.2001	0.000

*significant at the $p < 0.05$ level

Source: Authors

Companies that had higher accelerated liquidity also had a higher ROA in 2020. Employment and the trade category had no impact on ROA.

The results of the impact of current liquidity on ROA in 2020 are given in Table 13.

Table 13 Regression model 6

Variable	Coefficient	Standard error	p-value
L_TRENL*	0.1543	0.0669	0.025
L_ZAP	0.1094	0.1041	0.298
K_VEL	0.0133	0.1290	0.918
K_MAL	0.1248	0.1654	0.454
CONST*	-1.2216	0.2089	0.000

*significant at the $p < 0.05$ level

Source: Authors

Companies that had higher current liquidity also had a higher ROA in 2020. With the exception of the constant, other variables were not statistically significant.

The authors performed regression diagnostics for all models. A summary of the results is given in Table 14.

The table shows that the first three models are statistically significant at the level of significance $p < 0.05$. The remaining three models related to 2020 are statistically significant at the level of significance $p < 0.1$, but the liquidity variable in these models is significant at the level of $p < 0.05$. The problem of heteroscedasticity was examined by the Breusch-Pagan test and the obtained values were greater than 0.05, which confirmed the absence of

the problem of heteroscedasticity. The normality of the relation errors was examined by the Jarque-Bera test. The obtained values are greater than the limit value of 0.05, which indicates that the relation errors follow the normal distribution.

The authors examined multi-collinearity by using the variance inflation factor (VIF). The VIF results for all six models are given in Table 15.

Table 15 VIF results for all six models

Model	01	02	03	04	05	06
K_VEL	1.63	1.81	1.62	1.65	1.80	1.65
L_ZAP	1.37	1.37	1.37	1.39	1.38	1.38
K_MAL	1.26	1.42	1.36	1.25	1.40	1.33
L_LIKV*	1.04	1.23	1.11	1.03	1.20	1.09

*The L_LIKV variable indicates the type of liquidity used in the model

Source: Authors

All VIF values are less than five thus confirming the absence of multi-collinearity problems in all six models.

The impact of the indicators of current, immediate and accelerated liquidity, company size and the category of trade activity on ROA was examined for 2019 and 2020. All six models confirmed a statistically significant and positive impact of liquidity on the level of profitability in both years, which means that the increase in liquidity will result in an increase in the level of profitability of the observed companies. Control variables of company size and the trade category were not statistically significant.

4. Conclusion, recommendation and limitations of the research

The primary purpose of this study was to analyze liquidity management of Croatian small and medium-sized trade enterprises during the crisis caused by the COVID-19 pandemic. The authors used regression analysis to examine the impact of current liquidity, accelerated liquidity and immediate liquidity, the size of enterprises and the trade sector by subgroup on the profitability of small and medium enterprises in trade. The results of regression analysis showed that liquidity measured by these indicators has a statistically significant impact on

profitability measured by return on assets (ROA), i.e., the increase in liquidity affected the increase in ROA. If liquidity represents the ability of a company to settle its short-term liabilities in time, and profitability represents its business success, we can conclude that the company is able to meet its obligations and thus increase its profitability. If a company were not able to meet its obligations, it would have to find new sources of financing and borrowing, which increases costs, and thus reduces profits, i.e., reduces its business profitability. Company size and the trade category had no impact on profitability.

Previous research mainly focused on large enterprises, so that this research focused on small and medium-sized enterprises in trade that are important for a small post-transition economy, justifies its importance. Scientific contribution of this paper is in the review of relevant and recent literature on the impact of the crisis caused by the COVID-19 coronavirus on liquidity of small and medium-sized enterprises in trade. Previous research on the impact of the pandemic on business operations has been conducted mainly through surveys or questionnaires, so empirical research conducted on a selected sample of companies represents a significant contribution to economic science. A model for the analysis of the impact of liquidity on the profitabili-

ty of small and medium enterprises in trade activity has also been developed in the paper. The model is also applicable to similar transition and post-transition economies, especially to those in the region that have similar economic development as it will help economic policy makers and corporate managers understand the importance of the impact of liquidity on profitability levels. The model reads:

$$ROA = \beta_0 + \beta_1 \cdot L_{LIKV} + \beta_2 \cdot L_{ZAP} + \beta_3 \cdot K_{VEL} + \beta_4 \cdot K_{MA}$$

Research results presented in this paper make a scientific contribution in theoretical and applied terms to economic sciences. The scientific results obtained in this research will be beneficial to small and medium enterprises in Croatia, but also in the region where they will provide a better understanding of the relationship between liquidity and profitability.

During the preparation of this paper, the authors noticed certain limitations. A restriction was encountered at the time of data collection. The authors obtained the data from the annual financial statements of small and medium-sized enterprises, and for small enterprises only abbreviated financial statements submitted by small enterprises to FINA were available, which limited the possibility of a more detailed analysis.

Future research on the impact of COVID-19 on SME liquidity management should broaden the theoretical framework (assuming that there will be more papers on the impact of the crisis caused by COVID-19), take into account longer time series, expand research to other Croatian regions and analyze other activities. The paper provides a basis for further research that would compare liquidity management in small and medium-sized enterprises with large enterprises in similar economies.

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