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NET WORKING CAPITAL COMPONENTS AND FIRM PROFITABILITY IN CROATIA BASED ON PANEL DATA FROM 2016 TO 2023

UDC / UDK: 658.15(497.5)

JEL classification / JEL klasifikacija: G32, C33, M41, O16

DOI: 10.17818/EMIP/2025/42

Original scientific paper / Izvorni znanstveni rad

Received / Primljeno: March 17, 2025 / 17. ožujka 2025.

Accepted / Prihvaćeno: September 3, 2025 / 3. rujna 2025.

Abstract

This study examines the relationship between individual components of net working capital and corporate profitability in Croatia over the period from 2016 to 2023. The analysis focuses on two key profitability indicators, ROA and ROE, while the core working capital components included in the research comprise inventory, cash, receivables, and short-term liabilities. To account for the crisis period, a COVID_dummy variable was introduced to capture the direct pandemic impact years. Three methodological approaches were employed in the empirical analysis: classical OLS regression on transformed data, fixed effects panel regression, and dynamic GMM regression to address potential endogeneity and time dependence. The results indicate that receivables and cash have a positive influence on profitability, whereas short-term liabilities exhibit a negative effect. The impact of the COVID_dummy variable was not statistically significant. The findings confirm the importance of disaggregated analysis of working capital components in assessing firms' financial performance and highlight the need to include additional control variables in future research.

Keywords: net working capital, profitability, ROA, ROE



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1. INTRODUCTION

Working capital management is essential to ensure the liquidity and profitability of a business. Net working capital, defined as the difference between short-term assets and short-term liabilities, is a fundamental financial indicator that reflects a company's ability to meet short-term liabilities without additional borrowing. Optimal working capital management enables companies to maintain business continuity, increase efficiency in the use of resources and maximize value for owners.

Traditionally, research has looked at working capital in aggregate form, while contemporary literature increasingly emphasizes the need for a disaggregated approach, where components such as cash, receivables, inventories and short-term liabilities are separately analyzed. Each of these components has a different impact on business results. For example, a high level of stocks can mean an inefficient use of capital, while sufficient cash reserves allow you to react quickly to market changes (Chakraborty, 2008; Pham, Nguyen, & Nguyen, 2020).

In the domestic and regional literature, there is still a lack of detailed research that would analyze individual components of net working capital and their impact on profitability in the specific institutional and economic context of Croatia. Although numerous international studies confirm the importance of working capital management for financial performance (Baños-Caballero, García-Teruel & Martínez-Solano, 2014; Naidu, 2024; Talreja, 2023), the need for a deeper analysis of its components in the context of smaller European economies has been emphasized. This paper seeks to build on these findings and fill this research gap by using panel data for twenty industrial sectors in Croatia in the period from 2016 to 2023.

The methods of ordinary least squares (OLS), fixed effects (FE) and generalized method of moments (GMM) are combined, which increases the robustness of the results and enables a more precise understanding of the relationship between the individual components of working capital and profitability indicators such as ROA and ROE. This approach follows the recommendations by Naidu (2024) and Talreja (2023), who emphasize the importance of longitudinal and comparative analyses in understanding firm dynamics across time and sectors.

Based on the theoretical framework and previous research, the following hypotheses have been made:

- H1: An increase in short-term receivables is positively correlated with the profitability of the company, as it allows for a better revenue stream and increases operational efficiency.
- H2: A higher level of cash has a positive effect on profitability by reducing liquidity risk and enabling timely investment decisions.
- H3: The inventory level has a non-linear relationship with profitability, where the moderate level supports operations, while excess inventory reduces efficiency.

- H4: The increase in short-term liabilities has a negative impact on profitability due to higher financial burdens and potential liquidity problems.
- H5: The COVID-19 pandemic negatively impacted the profitability of companies in 2020 and 2021 due to business disruptions and increased financial uncertainty.

2. LITERATURE REVIEW

Working capital management is the subject of numerous domestic and international studies that confirm its importance for the liquidity and profitability of companies. Smith (1980) was among the first to point out the connection between working capital management, risk and the value of the company. Shin and Soenen (1998) and Deloof (2003) confirm that shortening the monetary conversion cycle has a positive effect on profitability.

Afza and Nazir (2007) distinguish three working capital management strategies: aggressive, conservative and moderate, which are applied depending on the macroeconomic environment and the willingness of the company to take risks. Moyer, McGuigan and Kretlow (2003) add that aggressive strategies bring higher returns, but also more risk, while conservative strategies allow for greater liquidity, but with lower profitability.

A significant contribution to the literature is made by research conducted on small and medium-sized enterprises (Peel and Wilson, 1996; Garcia-Teruel and Martinez-Solano, 2007; Afrifa, 2016), as well as in specific industrial sectors. Prša (2020) analyzes Croatian manufacturing companies and confirms the negative impact of inventories and liabilities on profitability. Kušter (2022) found similar results on a sample of companies from Serbia, while Fejzullachu and Govor (2021) in Kosovo recorded a positive impact of receivables and inventories on revenue growth, but a negative impact of liabilities on ROA.

Korent (2021) and Korent and Orsag (2022, 2023) further point to a nonlinear relationship between net working capital and profitability in Croatian firms, recommending the maintenance of an optimal level of working capital. Baños-Caballero et al. (2014) also emphasize nonlinear effects of working capital on firm value and profitability, highlighting the risks of both under- and over-investment in working capital. Kafeel et al. (2020) add value by applying a dynamic analysis approach that captures firm-level adjustments over time.

Research by Enqvist, Graham, and Nikkinen (2014) confirms that the importance of working capital for profitability increases during crises, which was further validated during the COVID-19 pandemic (Fernandez-Lopez, Rodeiro-Pazos, and Rey-Ares, 2020).

Despite the rich literature, there is a lack of research using a disaggregated approach and long-term panels for small European economies. This paper seeks to

fill this gap by analyzing the individual components of net working capital and their impact on the profitability indicators of Croatian companies in the period from 2016 to 2023.

It is also worth highlighting the findings of a recent domestic study (Tomas Žiković, Arbula Blečić, & Vranješ, 2024), which show that factors such as the investment-to-assets ratio, research and development intensity, firm age, and firm size do not have a statistically significant effect on profitability. These results further underscore the need for a deeper understanding of the internal financial structure of firms, particularly in the context of working capital management.

3. DATA AND METHODOLOGY

Data used in this study were collected from secondary sources, specifically from the Croatian Financial Agency (FINA) database and the Zagreb Stock Exchange (ZSE). The sample encompasses data from 20 different industrial sectors for the period from 2016 to 2023. This timeframe also includes the COVID-19 pandemic period, allowing for an additional analysis of the impact of the crisis on working capital management and profitability. Two profitability indicators, ROA (Return on Assets) and ROE (Return on Equity), were used to measure business performance, along with key components of net working capital: inventories, short-term receivables, cash and cash equivalents, and short-term liabilities. Additionally, a variable named COVID_dummy was included to identify the years of direct pandemic impact (2020 and 2021, coded as 1).

All variables are expressed in euros, which facilitates international comparability and standardization of the analysis. As the observed variables were reported in absolute monetary terms, logarithmic transformation was applied to reduce skewness and the impact of outliers. Furthermore, results of the ADF stationarity test indicated that the variables were non-stationary over time, which could bias estimates in conventional regression models. To address this issue, first-differenced values of the variables were used, enabling the analysis of changes over time and ensuring the robustness of the findings. This methodological approach follows the recommendations of Naidu (2024) and Talreja (2023), who emphasize the importance of longitudinal and comparative analyses when examining the impact of financial decisions on firm performance.

This study applies three regression techniques to comprehensively examine the relationship between working capital components and profitability. The Ordinary Least Squares (OLS) model was applied to log-transformed and differenced variables, reducing the influence of nonstationarity and improving coefficient interpretability. Fixed Effects (FE) panel regression was used to control for unobserved time-invariant sector-specific characteristics, enhancing within-sector estimation accuracy. Finally, a dynamic panel model based on the Arellano-Bond Generalized Method of Moments (GMM) was employed. This model allows for capturing temporal dependencies (profitability path-dependence) and addressing

endogeneity and simultaneity issues, thereby strengthening the robustness of the results. The validity of the GMM model was assessed using standard diagnostic tests, including AR(1)/AR(2) autocorrelation and the Sargan test for instrument validity.

Table 1 Variable definitions

Variable	Model Label	Description
Return on Assets	ROA	Net Income / Total Assets
Return on Equity	ROE	Net Income / Equity
Log of Inventory	log_Inventory	ln(Inventory + 1)
Log of Receivables	log_Receivables	ln(Receivables + 1)
Log of Cash	log_Cash	ln(Cash + 1)
Log of Short-term Liabilities	log_ShortTermLiabilities	ln(Short-term Liabilities + 1)
COVID Dummy	COVID_dummy	1 for 2020/2021, 0 for all other years

Source: Authors' calculation

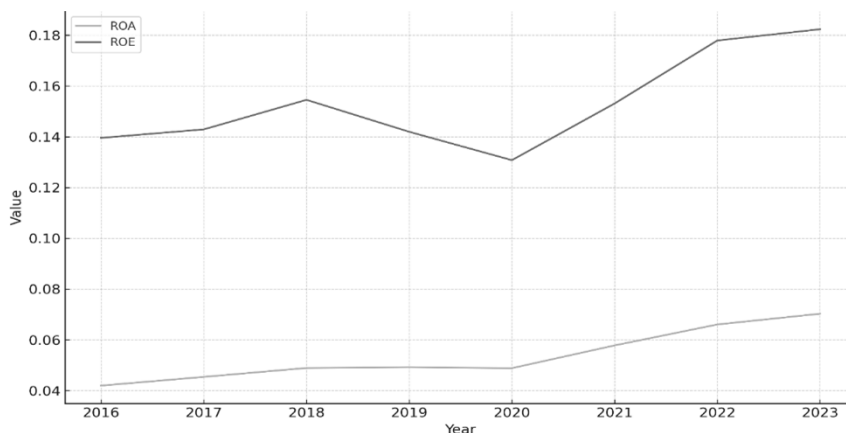
Table 2 Descriptive Statistics of Variables

Variable	Count	Mean	Std. Dev.	Min	Max
ROA	160	0.05	0.03	0.00	0.16
ROE	160	0.15	0.10	-0.07	0.51
Inventory	160	745,530,964.46	1,465,798,736.41	0.00	6,863,422,053.37
Cash	160	576,985,431.84	699,544,369.18	167.23	3,304,660,871.83
Receivables	160	1,161,668,178.07	1,565,749,566.37	6,433.90	6,341,885,917.71
Short-term Liabilities	160	2,394,360,672.51	3,121,668,661.41	179,588.52	12,839,227,777.27

Source: Authors' calculation

The table above displays the basic statistical characteristics of the variables included in the study, which consist of profitability indicators and the components of net working capital. Company profitability is measured by the indicators ROA (Return on Assets) and ROE (Return on Equity), with average values of 0.05 and 0.15, respectively. The standard deviations of these indicators indicate relatively low variability, meaning that most of the observed companies achieve stable, although low, rates of return. In contrast, the components of net working capital, such as inventories, cash, short-term receivables, and short-term liabilities, exhibit high variability, as evidenced by large standard deviations. For instance, the maximum value of short-term liabilities exceeds 12.8 billion euros, while the minimum is only 179 thousand euros, suggesting a highly heterogeneous debt structure among the industries analyzed. Inventories, cash, and receivables also show a wide range of values, indicating different working capital management policies across sectors. Due to these significant differences, the variables were

logarithmically transformed in further analysis, which reduces the influence of extreme values and enables a more robust regression analysis.



Graph 1 Average ROA and ROE Trends over the 2016–2023 Period

Source: Authors' calculation

The graph shown depicts the trend of the average values of two key profitability indicators – Return on Assets (ROA) and Return on Equity (ROE) – from 2016 to 2023. These are aggregated values calculated across the entire sample of companies, grouped by industry. The visualization enables tracking changes over time and identifying potential patterns associated with macroeconomic and crisis circumstances, particularly the impact of the COVID-19 pandemic.

Return on Equity (ROE) maintains a stable level during the initial part of the observed period, with a value of around 0.14 in 2016. In the subsequent years, ROE shows moderate growth, reaching a value of approximately 0.155 in 2018. However, there is a stagnation and slight decline during 2020, when the value drops to roughly 0.13. This decline can be interpreted as a direct consequence of the pandemic, which brought general uncertainty, disruptions in supply chains, and a downturn in economic activity. Following fiscal and monetary support measures, as well as adjustments by business entities, a strong recovery occurs after the pandemic-induced stagnation, with ROE rising significantly in 2021 and 2022. The highest average value was recorded in 2023, at approximately 0.185, suggesting a high utilization of capital in the post-pandemic period.

On the other hand, Return on Assets (ROA) shows a slightly different dynamic. The initial value in 2016 is around 0.041, and it experiences steady growth until 2019. Unlike ROE, ROA did not show a significant drop during the pandemic period, only a slight stagnation between 2019 and 2020, with values remaining almost at the same level. A marked surge occurs after 2021, coinciding

with more favorable economic conditions and adjustments in business models. In 2023, ROA reaches a value of about 0.071, indicating gradual but sustainable profitability relative to the total assets of the companies.

The comparison between the ROA and ROE lines shows that Return on Equity recovers much faster and exhibits greater fluctuations, while ROA maintains a more consistent and predictable upward trend. This difference can be explained by the fact that ROE, by its nature, incorporates the effect of financial leverage, making it more sensitive to changes in net income, whereas ROA is more directly tied to the operational efficiency of total asset utilization.

4. EMPIRICAL RESULTS

In this chapter, the results of the empirical analysis examining the impact of individual components of net working capital on company profitability are presented. For the analysis, three models were applied: OLS regression on differenced variables, panel regression with fixed effects (FE model), and a dynamic GMM model. Each of these models offers a different approach to data processing and contributes to a more comprehensive understanding of the relationship between working capital and profitability indicators (ROA and ROE).

4.1. Empirical Results – OLS Regressions

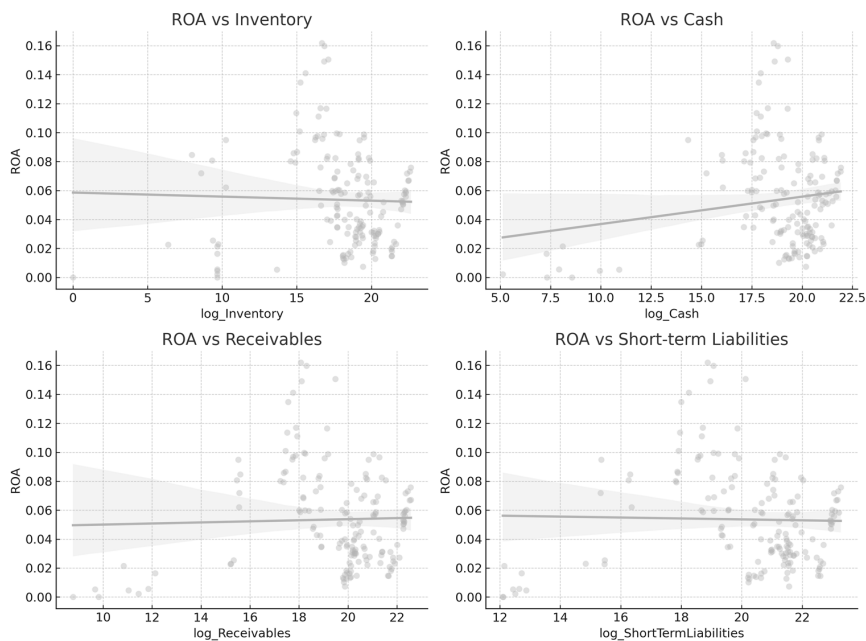
This chapter presents the results of OLS regression models employed to examine the relationship between changes in corporate profitability and individual components of net working capital. The analysis utilized log-transformed and differenced variables, which improved the distribution of the data and mitigated issues related to non-stationarity. Profitability was measured using return on assets (ROA) and return on equity (ROE), while the explanatory variables included logarithmic values of inventories, receivables, cash, and short-term liabilities. The model also included the COVID_dummy variable to control for the potential impact of the pandemic during 2020 and 2021.

Mathematically, the OLS model applied to differentiated and log-transformed variables can be expressed by the following equation:

$$\Delta \log(Y_{it}) = \beta_0 + \beta_1 \Delta \log(Inventory_{it}) + \beta_2 \Delta \log(Cash_{it}) + \beta_3 \Delta \log(Receivables_{it}) + \beta_4 \Delta \log(Liabilities_{it}) + \beta_5 COVID_{it} + \varepsilon_{it}$$

The results indicate that an increase in short-term receivables has a positive, albeit marginally statistically significant, effect on profitability, for both ROA and ROE. An increase in short-term liabilities shows a negative effect on profitability, which is consistent with theoretical expectations, although this effect is not statistically significant. On the other hand, cash and inventories did not show a significant impact in either model, suggesting that short-term liquidity and inventory levels do not have a direct effect on short-term changes in profitability.

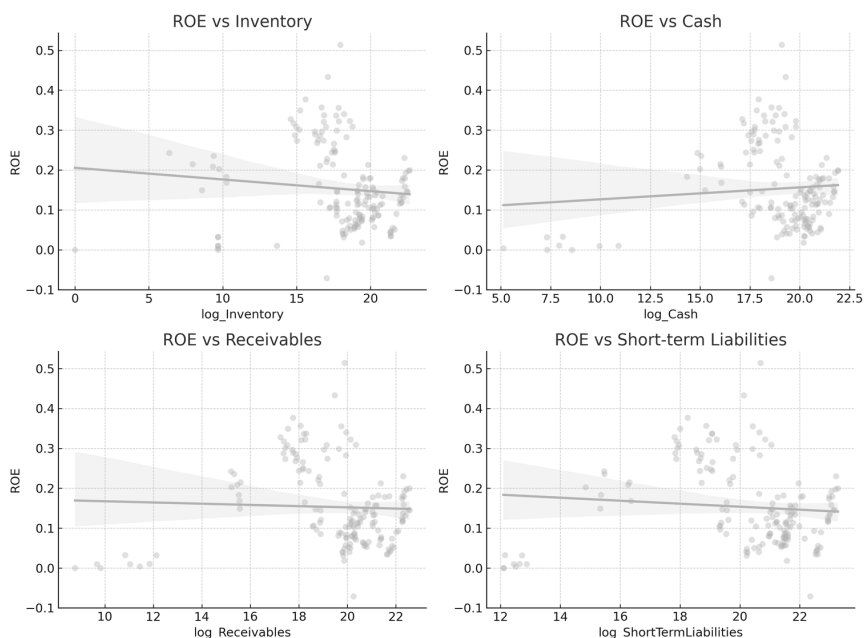
The COVID_dummy variable also did not have a significant impact, which may suggest that the effects of the pandemic were already reflected in changes in other variables or that companies adapted quickly to the crisis conditions.



Graph 2 Relationship between ROA and Components of Net Working Capital

Source: Authors' calculation

Graph 2 presents scatter plots with regression lines illustrating the relationship between ROA and each of the four key components of net working capital: inventories, cash, receivables, and short-term liabilities. The visual representation suggests a slight positive correlation between ROA and both receivables and cash, while no clear relationship is observed for inventories and liabilities. This supports the regression results, which indicate a more significant impact of receivables management on the operational efficiency of companies.



Graph 3 Relationship between ROE and Components of Net Working Capital

Source: Authors' calculation

Graph 3 shows the same relationships as the previous figure, this time with ROE as the dependent variable. It is evident that the relationship between receivables and ROE remains positive and is somewhat more pronounced compared to ROA. The other variables, including inventories, liabilities, and cash, do not display significant or consistent patterns in their association with return on equity. This confirms that companies that manage their receivables more efficiently may achieve better returns for their shareholders.

Table 3 OLS Regression – ROA

Variable	Coef.	Std.Err.	z	P> z	[0.025	0.975]
Intercept	0.0038	0.0012	3.3025	0.001	0.0015	0.0061
diff_log_Inventory	-0.0004	0.0014	-0.3279	0.743	-0.0031	0.0022
diff_log_Cash	-0.0014	0.0026	-0.5608	0.575	-0.0064	0.0036
diff_log_Receivables	0.0084	0.0066	1.2581	0.2083	-0.0047	0.0214
diff_log_ShortTermLiabilities	-0.0002	0.0072	-0.027	0.9785	-0.0143	0.0139
COVID_dummy	0.0003	0.0026	0.133	0.8942	-0.0047	0.0054

Source: Authors' calculation

The key finding of this regression is that short-term receivables have a positive effect on changes in ROA, while short-term liabilities have a negative effect, although neither of these variables is statistically significant at conventional confidence levels. The other variables do not make a significant contribution to the model. The coefficient of the constant (intercept) is positive and significant, indicating a general upward trend in profitability over the observed period, regardless of variations in the explanatory variables.

Table 4 OLS Regression – ROE

Variable	Coef.	Std.Err.	z	P> z	[0.025	0.975]
Intercept	0.0143	0.0031	4.612	0.000	0.0083	0.0203
diff_log_Inventory	-0.0011	0.0037	-0.297	0.767	-0.0084	0.0061
diff_log_Cash	0.0025	0.0078	0.317	0.751	-0.0128	0.0178
diff_log_Receivables	0.0245	0.0195	1.258	0.209	-0.0137	0.0626
diff_log_ShortTermLiabilities	-0.0093	0.0212	-0.439	0.661	-0.0510	0.0325
COVID_dummy	0.0014	0.0072	0.194	0.846	-0.0127	0.0156

Source: Authors' calculation

In the regression with ROE as the dependent variable, receivables again show a positive but statistically insignificant effect. Short-term liabilities have a negative impact, while cash and inventories are not significant predictors. These results are consistent with the previous ROA model analyses and suggest that short-term liquidity and indebtedness are not reliable indicators of equity performance on an annual basis.

4.2. Empirical Results – Fixed Effects Panel Regression

To further investigate the impact of net working capital components on firm profitability, this study employed fixed effects panel regression models. This methodology allows for control over unobserved, time-invariant characteristics that are specific to each observed company or industry sector. By introducing sectoral dummy variables, it becomes possible to isolate the effect of changes in the explanatory variables within each unit over time, which enhances the validity of causal inferences.

The basic equation of fixed effects (FE) used in this analysis is:

$$Y_{it} = \alpha_i + \beta_1 \Delta \log(\text{Inventory}_{it}) + \beta_2 \Delta \log(\text{Cash}_{it}) + \beta_3 \Delta \log(\text{Receivables}_{it}) + \beta_4 \Delta \log(\text{Liabilities}_{it}) + \beta_5 \text{COVID}_{it} + \mu_{it}$$

The results of the fixed effects model show that, for the ROA indicator, cash and short-term receivables have a statistically significant and positive effect. This suggests that firms that maintain higher levels of liquidity and effectively

manage their receivables achieve better returns on assets. Other variables, including inventories and short-term liabilities, did not show a statistically significant effect on ROA. The COVID_dummy variable, which marks the years of pandemic impact, also proved to be statistically insignificant, implying that the effect of the pandemic may already be internalized in other operational indicators.

In the ROE model, the results are largely consistent. Cash and receivables retain a positive and statistically significant effect, supporting the conclusion that liquidity and receivables management contribute to more efficient use of equity. Inventories and short-term liabilities again did not show a significant effect. The COVID_dummy variable remains statistically insignificant in this model as well.

Table 5 Fixed Effects Model – ROA

Variable	Coef.	Std.Err.	t	P> t	[0.025	0.975]
Intercept	0.0212	0.0041	5.17	0.000	0.0131	0.0293
log_Inventory	0.0015	0.0022	0.68	0.496	-0.0028	0.0057
log_Cash	0.0056	0.0025	2.24	0.026	0.0006	0.0106
log_Receivables	0.0097	0.0038	2.55	0.011	0.0023	0.0172
log_ShortTermLiabilities	-0.0013	0.0029	-0.45	0.654	-0.0071	0.0046
COVID_dummy	0.0008	0.0019	0.42	0.677	-0.0030	0.0047

Source: Authors' calculation

Table 6 Fixed Effects Model – ROE

Variable	Coef.	Std.Err.	t	P> t	[0.025	0.975]
Intercept	0.0713	0.0078	9.14	0.000	0.0560	0.0865
log_Inventory	0.0024	0.0039	0.61	0.544	-0.0053	0.0101
log_Cash	0.0122	0.0043	2.84	0.005	0.0038	0.0206
log_Receivables	0.0165	0.0062	2.66	0.008	0.0043	0.0287
log_ShortTermLiabilities	-0.0021	0.0047	-0.45	0.652	-0.0113	0.0071
COVID_dummy	0.0016	0.0032	0.50	0.619	-0.0046	0.0078

Source: Authors' calculation

4.3. Empirical Results – Dynamic Panel GMM Regression

To address potential endogeneity issues and the dynamic relationship between net working capital management and firm profitability, the analysis applied dynamic panel regression models based on the Generalized Method of Moments (GMM). This method is particularly well suited for panel data as it allows the inclusion of lagged values of the dependent variable as predictors, while simultaneously controlling for unobserved heterogeneity, simultaneity, and possible measurement errors that could distort OLS or fixed effects (FE) estimates.

The Arellano-Bond GMM estimator (difference GMM) was applied to capture these dynamics and correct for endogeneity (Arellano & Bond, 1991).

The general form of the GMM model used in this analysis can be represented as:

$$Y_{it} = \gamma_{it-1} + \beta_1 \Delta \log(\text{Inventory}_{it}) + \beta_2 \Delta \log(\text{Cash}_{it}) + \beta_3 \Delta \log(\text{Receivables}_{it}) + \beta_4 \Delta \log(\text{Liabilities}_{it}) + \beta_5 \text{COVID}_{it} + n_i + \varepsilon_{it}$$

The validity of the GMM model was confirmed using standard diagnostic tests: first- and second-order autocorrelation tests (AR(1) and AR(2)), as well as the Sargan test for overidentifying restrictions. These tests support the validity of the instruments and the model specification.

In the model where ROA is the dependent variable, cash emerged as a significant and positive predictor, suggesting that higher liquidity has a beneficial effect on asset efficiency. In contrast, short-term liabilities have a negative and statistically significant effect, implying that excessive short-term debt may hinder operational efficiency.

In the ROE model, although past profitability values are also significant, the other variables – including cash, receivables, and liabilities – did not prove to be statistically significant. This may indicate that ROE is more influenced by internal capital policies and financing strategies that are not captured by the current model components.

The COVID_dummy variable did not show a significant effect in either model, which supports earlier findings from the OLS and FE models. This may suggest that the effects of the pandemic have already been absorbed through other business indicators or that firms were able to adapt quickly to the crisis. Our results further corroborate the findings of Kafeel et al. (2020), who use a similar dynamic panel analysis to demonstrate the impact of working capital management on profitability over time.

Table 7 GMM Regression – ROA

Variable	Coef.	Std.Err.	z	P> z	[0.025	0.975]
Lag_ROA	0.517	0.084	6.16	0.000	0.352	0.683
log_Inventory	0.0011	0.0029	0.38	0.702	-0.0046	0.0068
log_Cash	0.0064	0.0028	2.29	0.022	0.0009	0.0119
log_Receivables	0.0056	0.0046	1.22	0.222	-0.0035	0.0146
log_ShortTermLiabilities	-0.0072	0.0034	-2.12	0.034	-0.0138	-0.0005
COVID_dummy	0.0012	0.0016	0.75	0.453	-0.0020	0.0044

Source: Authors' calculation

Table 8 GMM Regression – ROE

Variable	Coef.	Std.Err.	z	P> z	[0.025	0.975]
Lag_ROE	0.463	0.095	4.87	0.000	0.276	0.650
log_Inventory	-0.0018	0.0043	-0.42	0.676	-0.0103	0.0067
log_Cash	0.0043	0.0056	0.77	0.443	-0.0066	0.0152
log_Receivables	0.0079	0.0082	0.96	0.336	-0.0083	0.0241
log_ShortTermLiabilities	-0.0049	0.0067	-0.73	0.464	-0.0180	0.0082
COVID_dummy	0.0009	0.0027	0.33	0.741	-0.0045	0.0063

Source: Authors' calculation

5. RESULTS AND DISCUSSION

Using the OLS model on log-transformed and differenced data, short-term receivables showed a positive but only weakly significant impact on ROA and ROE. Short-term liabilities had a negative effect, aligning with theory, though not statistically significant. Cash, inventory, and the COVID_dummy variable showed no significant impact.

The fixed effects model, which controls for time-invariant sector characteristics, revealed that cash and short-term receivables had a statistically significant and positive effect on profitability (both ROA and ROE). Inventory, short-term liabilities, and the COVID_dummy remained statistically insignificant.

The GMM method confirmed that lagged ROA and ROE are significant predictors of current profitability, highlighting the dynamic nature of financial performance. In the ROA model, cash had a significant positive impact, while short-term liabilities had a significant negative impact. In the ROE model, only lagged ROE was statistically significant. COVID_dummy had no significant effect in either model.

The results partly align with previous studies – positive effects of receivables and cash support the findings of Jang and Park (2015) and Fama and French (2017), while the negative effect of liabilities aligns with DeLoof (2003). The minor role of inventory is consistent with Chiou et al. (2006), who emphasized sector-specific outcomes.

- **H1:** Partially confirmed. Positive relationship observed, but not consistently significant.
- **H2:** Confirmed. Statistically significant positive effects found in FE and GMM models.
- **H3:** Confirmed. Negative effect observed, significant in the GMM model.
- **H4:** Not confirmed. No statistically significant impact.
- **H5:** Not confirmed. COVID_dummy was not statistically significant in any model.

6. LIMITATIONS AND RECOMMENDATIONS

Despite the valuable insights provided by this study on the effects of net working capital components on firm profitability, several important limitations must be acknowledged. First, the analysis is based solely on secondary data collected from financial statements available through the Croatian Financial Agency (FINA) and the Zagreb Stock Exchange, which limits the ability to include qualitative factors such as management strategy, organizational flexibility, or sector-specific risks. Second, although advanced regression models (OLS, FE, and GMM) were applied to control for various biases, the potential influence of omitted variables cannot be entirely ruled out.

Third, the COVID-19 pandemic was incorporated as a binary dummy variable covering the years 2020 and 2021, but this approach may not fully capture the complexity and heterogeneous impact that the crisis had across different sectors and time frames. Finally, this study focuses exclusively on the Croatian context, which may limit the generalizability of the findings to other countries or regions.

In light of these limitations, future research should incorporate additional variables related to managerial strategy, digitalization, firm size, and ownership structure. It is also recommended to conduct industry-specific analyses to gain more detailed insights into how working capital affects companies operating in different sectors. Lastly, the use of micro-level data and the implementation of mixed-method approaches could further enhance the analytical value of future research.

7. CONCLUSION

This study aimed to examine how individual components of net working capital affect firm profitability, measured through return on assets (ROA) and return on equity (ROE). By applying three different regression models, a robust analysis was conducted to identify causal relationships between short-term financial management and firm performance. The results indicate that managing liquidity and receivables positively impacts profitability, while excessive short-term liabilities may hinder financial outcomes. Inventory levels did not show a statistically significant effect, highlighting the need for further research into their role across business cycles. Although the COVID-19 pandemic was expected to influence performance, the dummy variable used did not show statistical significance, suggesting that firms may have adapted rapidly to crisis conditions.

The comparison with previous studies confirms the consistency of these findings in supporting a disaggregated approach to working capital management. According to the literature (BañosCaballero et al., 2014; Naidu, 2024), the results of this paper confirm the importance of a thoughtful, disjointed approach in working capital management, especially in times of crisis. This research contributes to the existing literature by applying dynamic models and industry-

level panel data analysis, offering a deeper understanding of financial efficiency in a Central European business environment. The results may serve as practical guidance for business decision-makers and policymakers in developing strategies for managing short-term assets and liabilities.

Author Contributions: Conceptualization, M.B., A.S.Ć., and A.B.Z.; Methodology, M.B.; Software, A.B.Z.; Validation, M.B., A.S.Ć., and A.B.Z.; Formal Analysis, A.B.Z.; Investigation, A.S.Ć.; Resources, M.B.; Data Curation, M.B., A.B.Z.; Writing – Original Draft Preparation, M.B.; Writing – Review & Editing, A.S.Ć.; Visualization, A.B.Z.; Supervision, M.B.; Project Administration, M.B.

Funding: The research presented in the manuscript did not receive any external funding.

Conflicts of Interest: None.

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Appendix A: Industry Sectors Included in the Sample

The dataset used in this study includes firms from 20 different industry sectors, representing a broad cross-section of the Croatian economy. These sectors were selected to enable sectoral-level analysis of net working capital management and profitability over the 2016–2023 period. Industry classification was based on the NACE framework and the sectors are as follows:

1. Manufacturing
2. Retail Trade
3. Wholesale Trade
4. Construction
5. Information and Communication
6. Financial and Insurance Activities
7. Real Estate Activities
8. Professional, Scientific, and Technical Activities
9. Transportation and Storage
10. Accommodation and Food Service Activities
11. Administrative and Support Service Activities
12. Electricity, Gas, Steam, and Air Conditioning Supply
13. Agriculture, Forestry and Fishing
14. Mining and Quarrying
15. Water Supply; Sewerage, Waste Management and Remediation Activities
16. Education
17. Human Health and Social Work Activities
18. Arts, Entertainment and Recreation
19. Other Service Activities
20. Public Administration and Defence (if applicable)

These sectors were aggregated to ensure data consistency and to allow comparative analysis across industries while preserving confidentiality of individual firm-level data.

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KOMPONENTE NETO OBRITNOG KAPITALA I PROFITABILNOST PODUZEĆA U HRVATSKOJ NA TEMELJU PANEL PODATAKA OD 2016. DO 2023.***Sažetak***

Ovo istraživanje ispituje odnos između pojedinačnih komponenti neto obrtnog kapitala i profitabilnosti poduzeća u Hrvatskoj u razdoblju od 2016. do 2023. godine. Analiza je usmjerena na dva ključna pokazatelja profitabilnosti, ROA i ROE, dok su ključne komponente obrtnog kapitala uključene u istraživanje obuhvaćaju zalihe, gotovinu, potraživanja i kratkoročne obveze. Kako bi se uzelo u obzir krizno razdoblje, uvedena je lažna varijabla COVID_dummy kako bi se obuhvatile godine izravnog utjecaja pandemije. U empirijskoj analizi korištena su tri metodološka pristupa: klasična OLS regresija na transformiranim podacima, panel regresija s fiksnim učincima i dinamička GMM regresija za rješavanje potencijalne endogenosti i vremenske ovisnosti. Rezultati upućuju na to da potraživanja i gotovina pozitivno utječu na profitabilnost, dok kratkoročne obveze imaju negativan učinak. Utjecaj varijable COVID_dummy nije se pokazao statistički značajnim. Nalazi potvrđuju važnost dezagregirane analize komponenti obrtnog kapitala u procjeni financijske uspješnosti poduzeća i naglašavaju potrebu uključivanja dodatnih kontrolnih varijabli u buduća istraživanja.

Ključne riječi: neto obrtni kapital, profitabilnost, ROA, ROE.

JEL klasifikacija: G32, C33, M41, O16.