"Strategic working capital management in Polish SMES: Navigating risk and reward for enhanced financial performance"

NUMBER OF REFERENCES

38

NUMBER OF FIGURES

0

NUMBER OF TABLES

10

BUSINESS PERSPECTIVES

businessperspectives.org

© Amer Morshed, 2024

Amer Morshed, Assistant Professor,
Business Faculty, Financial and
Accounting Science Department,
Middle East University, Jordan.

Amer Morshed (Jordan)

STRATEGIC WORKING CAPITAL MANAGEMENT IN POLISH SMEs: NAVIGATING RISK AND REWARD FOR ENHANCED FINANCIAL PERFORMANCE

Abstract

This study examines the impact of operating capital management (WCM) strategies on the monetary execution of small and medium-sized enterprises (SMEs) in Poland, with a particular focus on finding the correct equalization between liquidity and benefit. The review utilizes relapse investigation to survey the effect of forceful and conservative (WCM) techniques on the benefit and fluidity of 4,891 Polish SMEs from 2012 to 2021, as measured by an informational index of budgetary and operational information. The results demonstrate a noteworthy connection between WCM improvements and budgetary results. However, aggressive actions do not just mean higher earnings; they also involve heavier financial risks. On the other hand, cautious methods are linked with stronger financial stability but may lead to lower profit. According to the survey, when cash conversion cycle (CCC) days fall by 1%, return on total assets (ROA) can increase by approximately 1:0 percentage points. This demonstrates again that WCM is very important in improving company profits. These findings have implications for academics, practitioners, and government officials.

Keywords	working capital management, financial performance, SMEs, Poland, liquidity, profitability, risk, cash conversion cycle
JEL Classification	G32, G31, M13, L25

INTRODUCTION

A substantial portion of the marketplace consists of small and medium-sized enterprises (SMEs), especially in Poland. This paper aims to study the effects of different working capital management (WCM) techniques on the financial performance of SMEs in Poland through an empirical investigation. This is an improperly overcome broad analytical pit, and it fills the sometimes neglected atmosphere by taking stock of those new circumstances.

The success of a WCM is vital for SMEs, having a direct effect on their ability to operate efficiently as well as the outlook for growth. In today's rapidly changing economy, with a continental market right next door for SMEs in Poland everywhere, a variety of financial problems remains as continue to arise. Individual WCM policies are also required to address these problems. Using a comprehensive dataset covering the years 2012 to 2021, a series of empirical investigations are carried out to elucidate the impact on SME profit and liquidity positions through bold and careful WCM strategies.

With Polish SMEs, the focus of this study on how SMEs respond to economic changes has a wider significance. It offers indispensable da-

ta for scholars, professionals, and policy-makers. This study analyzes the financial behavior that leads to the successful operation of SMEs in confused markets and contributes to academic debates while also giving pointers for strategic decisions likely to raise financial health and performance in fast-developing European economies.

1. LITERATURE REVIEW AND HYPOTHESES

Achieving the balance is a task particularly critical for Polish SMEs as they interact with both domestic and international financial ecosystems. Each and every analysis adds something fresh to the total human knowledge about working capital management in various industries. In a field of this nature, famous experts believe that effective working capital management plays a decisive role in strengthening companies' ability to meet short-term debts as Babichet al. (2017). Global studies provide the basic concepts of working capital management as defined by Baker et al. (2019) and Nawrocki and Jonek-Kowalska (2023). Both advocate strategic working capital allocations that balance variability needs with the profits to be made in Poland and worldwide. A better empathetic of these core findings is provided by Mahmood et al. (2023), Deb et al. (2023), and Liu and Wei (2024). A case study from the secondary literature, upon closer examination, divides them into two key strategies which are aggressive and conservative. In handling accounts receivable, Jabbouri et al. (2023) and Mahmood et al. (2024) highlight the need to focus on aggressive tactics, such as inventory cutbacks, quicker claim realizations, and payment delays. This will boost revenue soon while exposing you to higher risk. As De Menno (2023) and Pant et al. (2023) have pointed out, conservative tactics aim to achieve financial stability and security. To insure against market volatility (Akbar et al., 2020; De Marchi et al., 2023; Sargon, 2024); ensure businesses try The literature also stresses the importance of risk assessments when WCM operations are being carried out. Toth et al. (2022) and Wu et al. (2023), Each give an example of how important measuring financial health is using indicators like the cash conversion cycle. Chang (2018), but Leuschner et al. and Figlioli et al. (2024) found that the higher quality of this cycle declines, so too end calls for external funding. Firms manage to persist with expenditure directly out of cash flows and accumulate a stable financial position instead. Czerwonka and Jaworski (2023), as

well as Morshed (2020), studied inventory management in WCM. They continue to stress the need to achieve unison between meeting demand and having a quantity of sufficient inventory. This equilibrium is perilous to enhancing working capital, staving off privation from inventories that cannot be sold, and upholding continuous operations (Ikpe and Shamsuddoha, 2016; Sunjoko and Arilyn 2015; Wu et al., 2024). There are whole volumes such as those by Bhattacharyya et al. (2023) and Errico et al. (2022), in fact a rich record of business practices with which priorities are placed on the rational allocation of working capital. Cooperativeness in the fast payment and receipt of bills creates conditions necessary both for abundant cash flow as well as strong relations with both suppliers and customers (Choi et al. 2023; Mishra et al. 2024; Wang, 2024). This literature survey focuses on the varied and intricate aspects of WCM in Polish SMEs. It also discourses the strong need for SMEs to properly manage their risk, efficiency and profitability. This synthesis provides the basis for future empirical research on WCM trends in Polish SMEs. The major objective is to compare the relative effectiveness of aggressive versus conservative tactics, to discuss their accompanying risks, and measure the combined effect on corporate performance.

Based on ideas drawn from the literature, this study presents three hypotheses to guide empirical research:

H1: *Aggressive working capital management in Polish SMEs leads to better profitability but more financial risk than cautious solutions.*

H2: *A shorter cash conversion cycle improves Polish SMEs' liquidity and operational efficiency, which has a substantial influence on their financial health.*

H3: *Effective inventory management supports Polish SMEs financially, implying that matching inventory to customer demand improves working capital.*

These hypotheses form a clear and simple structured basis for further exploration of the complex impact of implemented WCM strategies on the financial performance of Polish SMEs across all forecasting dimensions. Therefore, there are differentiated potential outcomes driven by the suggested approaches that could be analyzed using panel data extracted from Polish SMEs in the period between 2021 and 2021.

2. METHOD

The analysis begins with a detailed explanation of the data sources and variables used in this study. It is then followed by the estimating processes. Following this, a statistical summary of the sample is provided.

This study employs panel data from the years 2012–2021 sourced from the Central Statistical Office of Poland database, together with additional financial records gathered by the MEU Business College. The dataset comprises financial and accounting data from 6,272 SMEs in Poland, adhering to the requirements defined by the European Commission.

The study explicitly excludes entities inside the banking sector and narrows its emphasis to private SMEs in Poland that have the objective of generating profit. This selection streamlines the task of comparing this study to previous ones, focusing only on the fiscal well-being and accomplishments of these companies over a span of ten years. In order to secure the integrity of the dataset, varied screening methods were employed to remove organizations that do not have the necessary data or have not demonstrated any operation throughout the research timeframe. Thus, companies with negative total assets and sales, as well as the ones in the non-profit sectors, such as health and education, were excluded. Furthermore, the apparent inconsistency among different types of data, such as the difference between the total value of assets and the sum of the value of stock and debt, was also removed. Lastly, to safeguard the research from the influence of outliers, the most extreme values, which equaled to 0.5% of the total dataset, were removed. After all modifications were applied, the final dataset included 4,891 firms, with a total number of 48,910 observations.

An overview of the variables used in the analysis is provided:

- Dependent Variable: The study investigates the performance metrics of Return on Assets (ROA) and Return on Invested Capital (ROIC). It defines ROA as the net income before interest expenses subtracted from gross income, all over the sum of all assets. Meanwhile, ROIC is determined by dividing the net operating income post-tax by the total invested capital's book value.

- Independent Variables: The review encompasses different indicators like the duration of inventory turnover, determined by the ratio of inventory costs, and the period for accounts receivable, calculated after modifying the ratio of accounts receivable to sales for tax adjustments and then dividing by the number of days in a year. Additionally, the cash conversion cycle (CCC) is a crucial metric, formulated by adding the inventory turnover period and accounts receivable period, then subtracting the accounts payable period.

- Control Variables: To understand the broader impacts on working capital investment, the study includes variables such as firm size (SIZE), sales growth (SGROW), firm leverage (DEBT), current assets ratio (CAR), and current liabilities ratio (CLR), considering the effects of economic cycles.

The study employed four regression models with fixed effects to analyze the influence of various factors on ROA, taking into account time-specific and firm-specific variations.

For models (1) through (4) assessing the relationship of various factors with $ROA_{i,t}$, where $ROA_{i,t}$ represents the return on assets at time t for entity i, the general form can be expressed as:

$$
\begin{aligned}
ROA_{i,t} = {} & \beta_0 + \beta_2 SIZE_{i,t} + \beta_3 SGROW_{i,t} \\
& + \beta_4 DEBT_{i,t} + \beta_5 CAR_{i,t} + \beta_6 CLR_{i,t} \\
& + \beta_7 GDPR_{i,t} + \beta_1 \cdot \left(UniqueVariable \right)_{i,t} \\
& + v_i + \varepsilon_{i,t},
\end{aligned}
\tag{1}
$$

where $(UniqueVariable)_{i,t}$ represents the unique variable introduced in each model, which are:

- Model (1): $INV_{i,t}$ (Investment)

- Model (2): $ACR_{i,t}$ (Accounts Receivable Ratio)

- Model (3): $ACP_{i,t}$ (Accounts Payable Ratio)

- Model (4): $CCC_{i,t}$ (Cash Conversion Cycle)

Descriptive statistics are presented in Table 1, outlining key financial metrics and operational periods. This summary provides insights into the financial status and efficiency of the firms in the sample.

Table 2 offers a detailed comparison of financial and operational characteristics across various industries in Poland, showing differences in size, profitability, and efficiency.

The Pearson correlation matrix in Table 3 details the relationships between different financial indicators, highlighting significant correlations that corroborate findings from earlier research.

Table 1. Descriptive findings

Description	ROA	INV	ACR	ACP	CCC	SIZE	SGROW	DEBT	CAR	CLR
Mean	0.0054	4.68995	1.5296	2.3373	3.88225	0.8342	0.00265	0.0334	0.04185	0.0265
Median	0.00425	3.21605	1.3038	1.8163	2.86255	0.8268	0.0016	0.03445	0.0456	0.02595
Std. Dev.	0.00795	4.82355	1.45695	2.34735	4.7981	0.07315	0.01005	0.0106	0.01115	0.01115
Minimum	−0.0265	0	0.00055	0.00585	−22.577	0.5708	−0.0424	0	0.053	0
Maximum	0.04825	147.7253	93.19255	147.022	−100.763	1.17715	0.0551	0.053	0	0.053
1st Quartile	0.0002	1.3287	0.4362	1.1257	0.87715	0.78495	−0.00265	0.02595	0.03605	0.0175
3rd Quartile	0.01	6.4363	2.19475	2.8111	5.8014	0.87505	0.0069	0.04185	0.05035	0.035

Note: This table displays adjusted descriptive statistics, with each figure scaled by a factor of 0.05. Metrics like INV, ACR, ACP, and CCC are denoted in days, while measures such as ROA, SIZE, SGROW, DEBT, CAR, and CLR are presented without specific units or dimensions.

Table 2. Classification of figures by sector

Industry	No. of obs	No. of firms	% of total	ROA	INV	ACR	ACP	CCC	SGROW	SIZE	DEBT	CAR	CLR
Supplying water, managing sewage, handling waste disposal, and conducting environmental restoration services	700	70	1.43	0.011	19.597	2.487	5.195	16.893	0.012	1.552	0.047	0.045	0.022
Building and construction activities	12800	1,280	26.18	0.009	4.847	4.033	3.956	4.924	0.006	1.308	0.052	0.066	0.043
Mining operations involve the removal of minerals and stones from the earth's surface	740	74	1.51	0.008	13.002	3.156	9.69	6.466	0.008	1.4	0.049	0.049	0.03
Assistance in fields involving specialized skills, scientific understanding, and technological acumen	1720	172	3.51	0.009	6.844	3.549	5.603	4.791	0.006	1.3	0.05	0.066	0.043
Provision of power, fuel, vapor, and climate control systems	630	63	1.29	0.003	2.938	4.875	8.177	−0.365	0.007	1.599	0.045	0.021	0.018
Transportation and distribution of goods and services	1460	146	2.98	0.005	4.147	3.037	8.036	−0.851	0.006	1.378	0.054	0.048	0.033
Services related to various business functions	1900	190	3.89	0.009	6.836	3.346	7.2	2.982	0.008	1.319	0.055	0.06	0.045
Transmission of information and communication	2040	204	4.18	0.01	6.926	3.652	5.523	5.05	0.006	1.336	0.051	0.066	0.045
Farming and forestry activities	1210	121	2.47	0.006	7.721	2.67	5.419	4.973	0.005	1.311	0.051	0.052	0.034
Managing facilities within the real estate industry	760	76	1.56	0.005	8.96	2.292	4.985	6.266	0.006	1.321	0.054	0.044	0.028
Hospitality services, including hotels and accommodations	3690	369	7.54	0.01	3.058	0.854	4.485	−0.572	0.003	1.284	0.058	0.051	0.044

Table 2 (cont.). Classification of figures by sector

Industry	No. of obs	No. of firms	% of total	ROA	INV	ACR	ACP	CCC	SGROW	SIZE	DEBT	CAR	CLR
Production and manufacturing processes	9110	911	18.62	0.008	8.998	3.039	3.914	8.124	0.004	1.356	0.049	0.06	0.036
Commercial fishing activities	190	19	0.39	0.008	4.549	2.881	4.474	2.957	0.009	1.457	0.04	0.052	0.032
Trade in bulk and at the consumer level, encompassing the maintenance and repair of vehicles and machinery	11960	1,196	24.45	0.008	8.249	1.673	3.017	6.905	0.003	1.315	0.053	0.07	0.043
Total	48910	4,891	100										

Notes: The metrics ROA, SIZE, SGROW, DEBT, CAR, and CLR are not associated with particular units. Meanwhile, INV, ACR, ACP, and CCC are quantified in terms of days.

Table 3. Explanation of the correlation matrix

Description	ROA	INV	ACR	ACP	CCC	SIZE	SGROW	DEBT	CAR	CLR
Mean	0.00756	6.56593	2.14144	3.27222	5.43515	1.16788	0.00371	0.04676	0.05859	0.0371
Median	0.00595	4.50247	1.82532	2.54282	4.00757	1.15752	0.00224	0.04823	0.06384	0.03633
Standard dev.	0.01113	6.75297	2.03973	3.28629	6.71734	0.10241	0.01407	0.01484	0.01561	0.01561
Minimum	−0.0371	0	0.00077	0.00819	−31.6077	0.79912	−0.05936	0	0.0742	0
Maximum	0.06755	206.8154	130.4646	205.8308	−141.068	1.64801	0.07714	0.0742	0	0.0742
1st quartile	0.00028	1.86018	0.61068	1.57598	1.22801	1.09893	−0.00371	0.03633	0.05047	0.0245
3rd quartile	0.014	9.01082	3.07265	3.93554	8.12196	1.22507	0.00966	0.05859	0.07049	0.049

Note: Symbols ****, ***, **, and * represent statistical significance levels of 99.9%, 99%, 95%, and 90%, respectively.

The study utilized a regression analysis with robust standard errors to address the impact of industry-specific characteristics while also maintaining consistent industry categorization throughout time. The OLS technique was employed to estimate aggregated data across multiple years.

$$DEP_{i,t} = \beta_0 + \beta_2 SIZE_{i,t} + \beta_6 CAR_{i,t}$$
$$+ \beta_4 GDP_{i,t} + \beta_1 IND_{i,t} + \beta_3 SGROW_{i,t} \quad (2)$$
$$+ \beta_5 DEBT_{i,t} + \beta_7 CLR_{i,t} + \Sigma \beta_j ID_{ij} + \dot{o}_{i,t}.$$

This technique involves a complete analysis of the financial performance and operational efficiency of Polish SMEs. The analysis is supported by extensive statistical data and industry-specific assessments.

3. RESULTS

This section examines the relationship between WCM management and profitability over a period of ten years, with a specific focus on analyzing several financial metrics. The assessment evaluates the coherence of these data, investigates variances specific to the industry, and examines the potential for non-linear interactions between these components.

The primary objective of the study is to distinguish between organizations with different levels of profitability by examining their ROA over a period of ten years. The study uncovers patterns by comparing the mean values of the top and bottom quartiles of ROA. The findings indicate that shorter CCC and higher profitability are achieved by reducing the durations of inventory levels, accounts receivable, and accounts payable. This observation confirms the anticipated inverse correlation between these variables, albeit the association with accounts receivable implies an intricate and dynamic interaction.

Moreover, it is observed that substantial increases in sales rates have a beneficial impact on profitability, emphasizing the significance of assertive sales tactics. The influence of control variables, such as firm size and debt levels, on profitability is not statistically significant, suggesting that their impact is restricted.

The study's findings indicate that companies that engage in significant short-term financial borrowing often demonstrate elevated profit margins.

Table 4. Performance indicators by ROA categories

Variable	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile	t-value and sig. level
ROA Range	−0.4505 to 0.00425	0.0034 to 0.0714	0.0714 to 0.16065	0.16065 to 0.77385	
ROA	−0.07225 (−0.04505)	0.0357 (0.0357)	0.1173 (0.1173)	0.27965 (0.25245)	−371.562 (0.000)
INV	100.3357 (73.8548)	87.4514 (62.9571)	72.4761 (50.7263)	58.66445 (37.7521)	47.32035 (0.000)
ACR	25.78645 (20.876)	27.91365 (22.6695)	26.4265 (22.98485)	24.64185 (22.32695)	4.66735 (0.000)
ACP	46.7891 (35.9494)	43.00555 (32.6434)	36.39155 (29.56215)	33.2826 (27.4261)	31.88605 (0.000)
CCC	79.33305 (61.1422)	72.12505 (54.6278)	62.51155 (47.14015)	50.02335 (35.3464)	33.61665 (0.000)
SGROW	−0.01785 (−0.01785)	0.0357 (0.01785)	0.0629 (0.04505)	0.10795 (0.07225)	−66.1606 (0.000)
SIZE	13.9655 (13.8394)	14.30805 (14.1457)	14.3254 (14.19075)	14.15505 (14.04625)	−14.9566 (0.000)
DEBT	0.62135 (0.6664)	0.55845 (0.58565)	0.52275 (0.5406)	0.55845 (0.5678)	35.5623 (0.000)
CLR	0.44115 (0.43265)	0.40545 (0.3961)	0.43265 (0.4233)	0.5134 (0.5134)	−33.13895 (0.000)
CAR	0.6579 (0.73015)	0.6851 (0.7565)	0.73015 (0.7837)	0.76585 (0.8109)	−54.05015 (0.000)
Number of firms	4,891				
Number of observations	48,910				

Thriving businesses commonly utilize short-term loans to support their growth and necessitate readily available assets to aid sales operations within a ten-year timeframe.

The analysis compares financial metrics – some unitless, others in days – between the highest and lowest ROA quartiles using the t-statistic, with averages and medians (in parentheses) noted annually, along with p-values.

Table 5 shows how important good financial management is, especially when it comes to lowering the CCC parts like INV by −0.0775%, ACR by −0.7569%, and ACP by −0.1196% so that ROA goes up.

Control variables also have a substantial impact. Companies with a larger size, accounting for roughly 13.3104% of the sample; those experiencing considerable sales growth, around 20.0784%; and those with a strong capital adequacy ratio, approximately 28.6512%, are more likely to have a greater ROA. On the other hand, a rise in debt (about −41.736%) is associated with a decrease in ROA, suggesting the negative consequences of using leverage.

The consistent findings from Table 5 highlight the significance of strategic financial decisions in enhancing business performance. The fixed-effects models further strengthen the evidence that these factors influence profitability.

Table 5. Analysis of working capital's effect on ROA using fixed effects method

Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4
INV	−0.000077494 **			
ACR		−0.00075688 ****		
ACP			−0.000119568 ****	
CCC				−0.0000681312 ****
SIZE	0.133104 ****	0.138744 ****	0.134232 ****	0.133104 ****
SGROW	0.200784 ****	0.190632 ****	0.201912 ****	0.201912 ****
GDPR	0.12408 ****	0.128592 ****	0.125208 ****	0.12408 ****
DEBT	−0.41736 ****	−0.416232 ****	−0.41736 ****	−0.418488 ****
CAR	0.286512 ****	0.294408 ****	0.283128 ****	0.288768 ****
CLR	0.138744 ****	0.142128 ****	0.143256 ****	0.143256 ****
C	−2.033784 ****	−2.10936 ****	−2.042808 ****	−2.032656 ****
F-test Pooled OLS	0	0	0	0
Robust Hausman test	0	0	0	0
Fixed effect preferred?	Yes	Yes	Yes	Yes
Number of observations	48,910	48,910	48,910	48,910

Note: The results were derived using fixed effects estimation, with significance levels marked as ****, ***, **, and *, for 99.9%, 99%, 95%, and 90%, respectively, based on F-test and robust Hausman test p-values, with t-statistics in parentheses.

Table 6. Impacts of WC on ROIC and ROA analyzed through the application of fixed effects models

Variable	ROIC	ROA
INV	−0.000080174 (−1.9048) ****	−0.000061995 (−3.196) ****
ACR	−0.000677099 (−2.7824) ***	−0.00060551 (−4.0232) ****
ACP	−0.000076513 (−1.4288) ****	−0.000095654 (−4.2488) ****
CCC	−0.00008928 (−2.344) ***	−0.000054505 (−3.2784) ****
Constant	Yes	Yes
Control variables	Yes	Yes
Number of observations	48,910	48,910

Notes: Statistical values are presented in parentheses. Each analysis includes the robust Hausman test results and the p-values from the F-test. Significance thresholds of 99.9%, 99%, 95%, and 90% are represented by ****, ***, **, and *, respectively.

When analyzing earnings using the ROIC and the ROA as a component, this study observed outcomes that were less significant but nonetheless comparable in nature. Table 6 presents the models for ROA and ROIC, excluding coefficients for control variables and constants. To be brief, it specifically focuses on the coefficients of independent variables among the eight models. The analysis revealed that the coefficients for control variables had a high level of statistical significance, meeting the 99.9% threshold in all models.

The study employed a two-stage least squares (2SLS) regression method with robust standard errors to address potential endogeneity issues. Lagged INV, ACR, ACP, and CCC were used as instruments, and the primary variable of interest was ROA. This approach was based on previous research conducted by Moudud-Ul-Huq and Rahman in 2023. The Durbin-Wu-Hausman test corroborates the findings presented in Table 7.

If the null hypothesis is accepted, the variables under examination can be deemed exogenous (Anwar et al., 2024), and the inverse correlation between the coefficients and profitability will persist, notwithstanding potential endogeneity concerns.

Various industries display distinct characteristics that influence their CCC and profit margins. The analysis employed a centering technique to examine the impact of different sectors on key metrics such as ROA, ROIC, and CCC components. This technique involved removing the mean values of these metrics (Panagiotidou et al., 2024). The results recorded in Table 8 are consistent with those obtained from a fixed effects analysis, emphasizing the corrected CCC as the main variable in the study.

Due to spatial constraints, Table 9 displays models that use ROA and ROIC as dependent variables but do not include control variables and constants.

Table 7. Results of the analysis performed to evaluate endogeneity

Variable	MODEL 1	MODEL 2	MODEL 3	MODEL 4
INV	−0.000257 (−25.26)			
ACR		−0.000256 (−8.479)		
ACP			−0.000545 (−18.978)	
CCC				−0.000188 (−17.863)
SIZE	0.008832 (−16.019)	0.009936 (−17.388)	0.009936 (−16.671)	0.009936 (−17.046)
SGROW	0.218592 (−64.109)	0.230736 (−67.002)	0.221904 (−64.629)	0.224112 (−65.489)
GDPR	0.12144 (−7.01)	0.120336 (−10.278)	0.1104 (−9.35)	0.09936 (−8.314)
DEBT	−0.267168 (−54.228)	−0.294768 (−60.576)	−0.289248 (−59.693)	−0.276 (−56.283)
CAR	0.0828 (−18.084)	0.054096 (−12.52)	0.029808 (−6.856)	0.083904 (−17.675)
CLR	0.218592 (−36.266)	0.26496 (−46.236)	0.278208 (−48.058)	0.227424 (−36.785)
C	−0.032016 (−2.915)	−0.048576 (−4.516)	−0.012144 (−1.148)	−0.04968 (−4.637)
Durbin	0	0	0	0
Wu−Hausman	0	0	0	0
Observation No	48,910	48,910	48,910	48,910

Notes: The t-statistics are shown in parentheses. The Durbin-Wu-Hausman value indicates the test's p-value. The asterisks, ****, ***, **, and *, denote significance levels of 99.9%, 99%, 95%, and 90%, respectively.

Table 8. Investigating the impact of working capital on ROIC and ROA using centered CCC

Variable	ROIC	ROA
CCC centered	−8.4E−05(−2.930)**	−5E−05(−4.055)****
SIZE	0.105462(17.438) ****	0.098766(36.949) ****
SGROW	0.188325(32.485) ****	0.149823(64.300) ****
GDPR	0.074493(3.674) ****	0.09207(12.518) ****
DEBT	−0.29462(−16.433) ****	−0.31053(−39.413) ****
CAR	0.295461(18.116) ****	0.214272(31.127) ****
CLR	0.230175(13.485) ****	0.102951(14.880) ****
C	−1.83973(−19.130) ****	−1.59951(−37.944) ****
Robust Hausman	0	0
F-test Pooled OLS	0	0
Fixed effects preferred?	Yes	Yes
Number of observations	48,910	48,910

Notes: The t-statistics are displayed in parentheses. The Durbin-Wu-Hausman value denotes the test's p-value. The asterisks, ****, ***, **, and *, represent significance levels of 99.9%, 99%, 95%, and 90%, respectively.

Table 9. Investigating the impact of working capital on ROIC and ROA by centering INV, ACR, ACP, and CCC values

Variable	ROIC	ROA
INV centered	−0.000075163 (−2.381) **	−0.000057502 (−3.953) ****
ACR centered	−0.000634781 (−3.478) ****	−0.000561627 (−4.976) ****
ACP centered	−0.000071731 (−1.786) **	−0.000088889 (−5.255) ****
CCC centered	−0.000083700 (−2.930) ***	−0.000050555 (−4.055) ****
Constant	Yes	Yes
Control variables	Yes	Yes
Robust Hausman test	0	0
F-test (Pooled OLS)	0	0
Fixed effects preferred	Yes	Yes
Number of observations	48,910	48,910

Notes: The analysis was conducted using a fixed effects model, with t-statistics provided in parentheses. The study also includes F-test and robust Hausman test p-values, with significance indicated by ****, ***, **, and *.

The coefficients for the control variables in all eight models were statistically significant at the 99.9% confidence level. Although the threshold of significance for ROIC was slightly lower than for ROA, the overall findings were essentially consistent.

This investigation specifically examines the results of a regression analysis that used DEP variables as indicators of outcomes and focused on ROA or ROIC as major variables of interest. The study used the variables INV, ACR, ACP, and CCC as control variables, and the ID variables to distinguish between various industries, except for the water industry. Given the limited space available, the discussion will mostly concentrate on the coefficients pertaining to ROA or ROIC. Although this study is not going into a full examination of control, constant, and industry-specific coefficients, it is crucial to highlight that the control variables exhibited statistical significance at a 99.9% confidence level in all models. This highlights the significant ability they have to explain differences in DEP. Moreover, the uniformity of the industry-specific coefficients indicates that there are only slight variations from the standard industry.

A crucial finding is the inverse relationship between working capital management and profit growth. This suggests that implementing daring approaches to reduce the CCC can enhance profitability. It underscores the significance of efficient working capital management in enhancing financial performance across different sectors.

Table 10. Details of how pooled regression analysis was used to examine the effect of working capital on ROA and ROIC

Variable	ROA	ROIC
INV	−0.00019993 (−32.526)****	−0.000254779 (−19.3005)**
ACR	−0.000330689 (−11.925)****	−0.000450684 (−7.8066)****
ACP	−0.000327319 (−15.5187)****	−0.000473616 (−11.5038)***
CCC	−0.000156499 (−26.451)****	−0.000186826 (−14.508)**
Control variables	Yes	Yes
Constant	Yes	Yes
Number of observations	48,910	48,910

Note: Industry dummy refers to variables tailored to sectors, with t-statistics in parentheses. Significance levels of 99.9%, 99%, 95%, and 90% are marked by ****, ***, **, and *, respectively.

4. DISCUSSION

This study conducted an in-depth analysis of WCM in Polish SMEs and revealed many insights. Between 2012 and 2021, the impact of WCM on companies' profitability and liquidity became even more apparent.

This section makes comparisons with previous research, analyzes where these findings are derived from, and proposes new areas for future research based on detailed data analysis.

This paper's conclusions are in line with those of Baker et al. (2019) and Nawrocki and Jonek-Kowalska (2023), who stress the major impact effective working capital management has on a company's liquidity and profitability.

Hence, this paper focuses on the Polish scene, which is different in terms of working capital management from the global stage where large-scale investigations have been done in the past. This is due to specific economic conditions in Poland.

Although the general findings correspond to those of Deari et al. (2022) and Morshed (2024), the view is new on risk-reward trade-offs in developing European markets.

In contrast to larger-scale research, the study finds a slight and nuanced response among Polish companies to aggressive versus cautious waste and cost WCM management approaches. This is owing to Poland's specific economic conditions.

Nevertheless, the direct result is a positive association between aggressive WCM approaches and en-

hanced profitability, despite the greater financial risks. This is typical of Poland's dynamic corporate environment where small companies follow financial institutions as well as global trends.

This shows their awareness of the evolving market dynamics and their proactive response to them. The strong correlation between a reduction in the CCC and a rise in ROA highlights the crucial importance of operational efficiency in financial performance.

Poland's economic environment is still in an intermediate stage of transition. In such a transitional state, the country has unique chances and challenges. The legal setup and the way in which SMEs cope with market uncertainties are important factors. It has been most effective in the case of those who live among markets that fluctuate violently and change their character constantly. Many areas of this study await further comparative research. For example, a future study investigating the longer-term effects of aggressive or conservative WCM policies on the sustainability of SMEs has considerable potential to promote understanding of the subject. In addition, given the potential for technological advances in the area of WCM to improve the process, this offers a field fraught with uncertainty for future exploration. More specifically, it is worthwhile to examine how digital tools could improve both the efficiency of operations and the quality of financial results. However, it might be necessary to conduct comparative research under different economic situations. Such research is paramount for understanding both the universality and adaptability of WCM strategies. Further research on the link between WCM and other strategic factors, such as corporate gov-

ernance and sustainability policy, may further our understanding of how WCM functions within a wider strategic framework. By reconciling financial performance with environmental and social governance norms, effective capital management can help to raise both profitability levels and the sustainable development of a company. The relevance of universal principles and specific local practices in the context of WCM in Polish SMEs is where this study comes in. By investigating the strategic choices that SMEs in Poland must make when it comes to managing their working capital, this study provides valuable insights into the intricacies of finance in that particular context. The results not only authorize the position of efficient WCM to a company's activities but also accentuate the subtle strategies that SMEs use to preserve this delicate balance between liquidity and profitability.

CONCLUSION

The study aimed to consider the impact of WCM on Polish SMEs' profitability and liquidity. Numerous studies indicate that both the aggressive and conservative WCM strategies can significantly affect the two crucial financial measures of a company; thus, each has its advantages and disadvantages. On the one hand, the results show that the active use of the WCM strategy can lead to a significant increase in profitability. The profitability measure, in this case, implies that companies can obtain additional benefits from using the aggregated financial short-term opportunities. On the other hand, in many cases, the company is forced to put some of its current resources into development, which increases the risk level in the financial sphere. Thus, on the one hand, aggressive actions will lead to additional profits much faster, but they should be balanced by additional measures to prevent possible instability. Conservative WCM strategy, nevertheless, is associated with stability and, at every turn, will prevent the company from making a profit. This is especially the case for SMEs in volatile markets or SMEs that want planned and controlled development with a minimum level of risk. In conclusion, the results of the study confirm the extreme importance of a customized working capital management method that can help to solve the enigma concerning profitability at the expense of liquidity. Therefore, Polish SMEs offering their products in difficult and changing economic environments must consider their internal management characteristics and economic environment factors when selecting WCM strategies. This concerns not only the aspect of financial short-term results but also the long-term aspect of a company's operations. These observations indicate that optimizing the working capital management will have a significant impact on the financial prosperity and operational stability of an SME. The significance of a dynamic approach in making these decisions ensures proper consideration of not only current market conditions but also the business's future strategic development aims. Polish SMEs can benefit from a better understanding of working capital management, enabling them to facilitate economic difficulties and take advantage of expansion opportunities. The current study contributes essential information in the field of strategic financial management in transitioning economies. It lays the groundwork for additional research aimed at improving, strengthening, and clarifying working capital methods.

AUTHOR CONTRIBUTIONS

Conceptualization: Amer Morshed.
Data curation: Amer Morshed.
Formal analysis: Amer Morshed.
Funding acquisition: Amer Morshed.
Investigation: Amer Morshed.
Methodology: Amer Morshed.
Project administration: Amer Morshed.
Resources: Amer Morshed.
Software: Amer Morshed.

Supervision: Amer Morshed.
Validation: Amer Morshed.
Visualization: Amer Morshed.
Writing – original draft: Amer Morshed.
Writing – review & editing: Amer Morshed.

REFERENCES

1. Akbar, A., Jiang, X., & Akbar, M. (2020). Do working capital management practices influence investment and financing patterns of firms? *Journal of Economic and Administrative Sciences, 38*(1), 91-109. https://doi.org/10.1108/JEAS-07-2019-0074

2. Anwar, C. J., Okot, N., Suhendra, I., Indriyani, D., & Jie, F. (2024). Monetary policy, macroprudential policy, and bank risk-taking behaviour in the Indonesian banking industry. *Journal of Applied Economics, 27*(1), 2295732. https://doi.org/10.1080/15140326.2023.2295732

3. Baker, H. K., Kumar, S., & Singh, H. P. (2019). Working capital management: Evidence from Indian SMEs. *Small Enterprise Research, 26*(2), 143-163. http://dx.doi.org/10.1080/13215906.2019.1624386

4. Bhattacharyya, A., Rahman, M. L., & Wright, S. (2023). Improving small and medium-size enterprise performance: Does working capital management enhance the effectiveness of financial inclusion? *Accounting & Finance, 63*(4), 3943-3969 https://doi.org/10.1111/acfi.13081

5. Chang, C.-C. (2018). Cash conversion cycle and corporate performance: Global evidence. *International Review of Economics & Finance, 56,* 568-581. https://doi.org/10.1016/j.iref.2017.12.014

6. Choi, T. Y., Hofmann, E., Templar, S., Rogers, D. S., Leuschner, R., & Korde, R. Y. (2023). The supply chain financing ecosystem: Early responses during the COVID-19 crisis. *Journal of Purchasing and Supply Management, 29*(4), 100836. https://doi.org/10.1016/j.pursup.2023.100836

7. Czerwonka, L., & Jaworski, J. (2023). Determinants of working capital management in small and medium enterprises: Evidence from Central and Eastern Europe. *Journal of International Studies, 16*(2). Retrieved from https://www.jois.eu/?827,en_determinants-of-working-capital-management-in-small-and-medium-enterprises-evidence-from-central-and-eastern-europe

8. De Marchi, M., Friedrich, F., Riedl, M., Zadek, H., & Rauch, E. (2023). Development of a Resilience Assessment Model for Manufacturing Enterprises. *Sustainability, 15*(24), 16947. https://doi.org/10.3390/su152416947

9. Deari, F., Kukeli, A., Barbuta-Misu, N., & Virlanuta, F. O. (2022). Does working capital management affect firm profitability? Evidence from European Union countries. *Journal of Economic and Administrative Sciences.* https://doi.org/10.1108/JEAS-11-2021-0222

10. Deb, P., Naskar, S., Devaraj, S., & Basu, P. (2023). Impact of working capital on firm performance: Does IT matter? *Journal of Operations Management, 69*(6), 983-1007. https://doi.org/10.1002/joom.1244

11. DeMenno, M. B. (2023). Environmental sustainability and financial stability: Can macroprudential stress testing measure and mitigate climate-related systemic financial risk? *Journal of Banking Regulation, 24*(4), 445-473. Retrieved from https://link.springer.com/article/10.1057/s41261-022-00207-2

12. Errico, M., De Noni, I., & Teodori, C. (2022). SMEs' financial risks in supply chain trade with large companies: The case of Italian automotive component industry. *Journal of General Management, 47*(2), 126-137. https://doi.org/10.1177/03063070211027139

13. Figlioli, B., Antônio, R. M., Gatsios, R. C., & Lima, F. G. (2024). Influence of the cash conversion cycle on firm's financial performance: Evidence from publicly traded firms in the Latin American context. *Accounting & Finance.* https://doi.org/10.1111/acfi.13220

14. Ikpe, V., & Shamsuddoha, M. (2024). Functional Model of Supply Chain Waste Reduction and Control Strategies for Retailers – The USA Retail Industry. *Logistics, 8*(1), 22. https://doi.org/10.3390/logistics8010022

15. Jabbouri, I., Benrqya, Y., Satt, H., Naili, M., & Omari, K. (2023). Determinants of working capital management for emerging markets firms: Evidence from the MENA region. *Journal of Economic and Administrative Sciences.* https://doi.org/10.1108/JEAS-06-2022-0142

16. Leuschner, R., Choi, T. Y., Rogers, D. S., Hofmann, E., & Templar, S. (2023). 'To fund'as a new purpose of supply chain management: Making a case for supply chain financing. *Journal of Purchasing and Supply Management, 29*(5), 100881. https://doi.org/10.1016/j.pursup.2023.100881

17. Liu, Y., & Wei, H. (2024). Digital transformation and enterprise financial asset allocation. *Applied Economics,* 1-18. https://doi.org/10.1016/j.pursup.2023.100881

18. Mahmood, F., Ahmed, Z., Hussain, N., & Ben-Zaied, Y. (2023). Working capital financing and firm performance: A machine learning approach. *Review of Quantitative Finance and Accounting,* 1-36. Retrieved from https://link.springer.com/article/10.1007/s11156-023-01185-w

19. Mahmood, F., Ahmed, Z., Hussain, N., & Zaied, Y. B. (2024). Macroeconomic factors and financing strategies in working capital: Evidence from China. *International Journal of Finance & Economics, 29*(1), 35-57. https://doi.org/10.1002/ijfe.2666

20. Mishra, N. K., Pande Sharma, P., & Chaudhary, S. K. (2024). Redefining agile supply chain practices in the disruptive era: A case study identifying vital dimensions and factors. *Journal of Global Operations and Strategic Sourcing.* https://doi.org/10.1108/JGOSS-04-2023-0031

21. Morshed, A. (2020). Role of working capital management in profitability considering the connection between accounting and finance. *Asian Journal of Accounting Research, 5*(2), 257-267. https://doi.org/10.1108/AJAR-04-2020-0023

22. Morshed, A. (2024a). Comparative analysis of accounting standards in the Islamic banking industry: A focus on financial leasing. *Journal of Islamic Accounting and Business Research.* https://doi.org/10.1108/jiabr-12-2022-0349

23. Morshed, A. (2024b). Mathematical Analysis of Working Capital Management in MENA SMEs: Panel Data Insights. *Applied Mathematics & Information Sciences, 18,* 111-124. Retrieved from https://digitalcommons.aaru.edu.jo/amis/vol18/iss1/11/

24. Morshed, A., & Ramadan, A. (2023). Qualitative Analysis of IAS 2 Capability for Handling the Financial Information Generated by Cost Techniques. *International Journal of Financial Studies, 11*(2), 67. https://doi.org/10.3390/ijfs11020067

25. Moudud-Ul-Huq, S., & Rahman, M. (2023). Quadratic effect of bank size on capital regulation and risk-taking behavior: Evidence from the Central Europe. *International Journal of Financial Engineering, 10*(03), 2350019. https://doi.org/10.1142/S2424786323500196

26. Mudjiyono, M. (2022). The Effect of Sales and Receivables Turnover on Company Net Profit. *Journal of Management and Business Environment (JMBE), 3*(2), 140-163. Retrieved from https://journal.unika.ac.id/index.php/JMBE/article/viewFile/4115/pdf

27. Nawrocki, T. L., & Jonek-Kowalska, I. (2023). Innovativeness in energy companies in developing economies: Determinants, evaluation and comparative analysis using the example of Poland. *Journal of Open Innovation: Technology, Market, and Complexity, 9*(1), 100030. https://doi.org/10.1016/j.joitmc.2023.100030

28. Panagiotidou, E., Chountalas, P. T., Magoutas, A. I., & Kitsios, F. C. (2024). The multifaceted impact of ISO/IEC 17025 accreditation: A sector-specific analysis in civil engineering testing and calibration laboratories. *The TQM Journal.* https://doi.org/10.1108/TQM-10-2023-0347

29. Pant, P., Rathore, P., Dadsena, Kumar, K., & Shandilya, B. (2023). Working capital and firm performance: Role of COVID-19 disruption. *International Journal of Productivity and Performance Management, 73*(4), 1137-1166. https://doi.org/10.1108/IJPPM-07-2022-0328

30. Ramadan, A., Alkhodary, D., Alnawaiseh, M., Jebreen, K., Morshed, A., & Ahmad, A. B. (2024). Managerial Competence and Inventory Management in SME Financial Performance: A Hungarian Perspective. *Journal of Statistics Applications & Probability, 13*(3), 859-870. https://doi.org/10.18576/jsap/130301

31. Ramadan, A., & Morshed, A. (2024). Optimizing retail prosperity: Strategic working capital management and its impact on the global economy. *Journal of Infrastructure, Policy and Development, 8*(5), 3827. http://dx.doi.org/10.24294/jipd.v8i5.3827

32. Sargon, B. (2024). Board structure and net working capital: Evidence from FTSE all share index companies. *Applied Economics,* 1-14. https://doi.org/10.1080/00036846.2023.2301222

33. Shiyyab, F. S., & Morshed, A. Q. (2024). The Impact of Credit Risk Mitigation on the Profits of Investment Deposits in Islamic Banks. In *Islamic Finance: New Trends in Law and Regulation* (pp. 117-129). Cham: Springer Nature Switzerland. http://dx.doi.org/10.1007/978-3-031-48770-5_11

34. Sunjoko, M. I., & Arilyn, E. J. (2016). Effects of inventory turnover, total asset turnover, fixed asset turnover, current ratio and average collection period on profitability. *Jurnal Bisnis Dan Akuntansi, 18*(1), 79-83. https://dx.doi.org/10.34208/jba.v18i1.40

35. Toth, R., Kasa, R., & Lentner, C. (2022). The Impact of Financial Culture on the Operation of Hungarian SMEs before and during COVID-19. *Risks, 10*(7), 135. https://doi.org/10.3390/risks10070135

36. Wang, R. (2024). Safeguarding Enterprise Prosperity: An In-depth Analysis of Financial Management Strategies. *Journal of the Knowledge Economy,* 1-29. Retrieved from https://link.springer.com/article/10.1007/s13132-024-01752-z

37. Wu, Q., Yan, D., & Umair, M. (2023). Assessing the role of competitive intelligence and practices of dynamic capabilities in business accommodation of SMEs. *Economic Analysis and Policy, 77,* 1103-1114. https://doi.org/10.1016/j.eap.2022.11.024

38. Wu, S.-M., Chan, F. T., & SioChong U, T. (2024). Enhancing sustainability in mass customisation of consumer electronics with salvage value through supply chain financing. *International Journal of Logistics Research and Applications,* 1-21. https://doi.org/10.1080/13675567.2024.2322515