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Factors that Influence the Liquidity–Profitability Relationship in Companies Listed on the WSE

Abstract

This article examines the relationship between financial liquidity and profitability among non-financial companies listed on the Warsaw Stock Exchange (WSE), exploring the factors that influence this dependence, such as net working capital strategy, sales volume, and asset levels. To achieve this, companies were categorised into portfolios based on their working capital strategy, sales volume, and asset levels. Correlation and regression analyses were then conducted within each portfolio to identify variations in the liquidity-profitability relationship across these categories. The research reveals that the relationship between financial liquidity and profitability is not uniform, demonstrating that it varies significantly depending on a company's net working capital strategy, sales volume, and asset level. These observed differences across portfolios highlight the specific factors that shape this relationship. The findings support the applicability of theoretical assumptions regarding the liquidity-profitability relationship to the specific context of the surveyed non-financial companies listed on the WSE. However, the study's focus on publicly listed companies on the WSE excludes private companies, which may exhibit a different liquidity-profitability relationship.

Keywords

liquidity | profitability | factors

JEL Codes

G3, M2

1. Introduction

The intricate relationship between liquidity and profitability is a cornerstone of corporate finance theory. This relationship is often market-specific due to competitive pressures and benchmarking, which limit the generalizability of findings. In emerging markets, like Poland, with less developed inter-firm relationships (e.g., supplier, customer, competitor), the link between liquidity and profitability may be less stable (Dong et al., 2021). However, with market maturation, these relationships are hypothesised to solidify. The Warsaw Stock Exchange (WSE), after 30 years of operation and with companies having a relatively long market presence, provides a suitable context to investigate this relationship among listed companies. Research on emerging markets also indicates that factors like financial constraints can influence financial policies, such as the optimal level of cash holdings (Anton, 2019), highlighting the

importance of understanding firms' financial policies in these economies.

Prior domestic and international research has yielded inconsistent findings regarding the strength and direction of the liquidity-profitability relationship, underscoring the need for more granular analyses. Specifically, the literature lacks consensus on the precise definition and measurement of liquidity and profitability, the direction of their interdependency, and the influence of salient factors such as firm size, industry affiliation, and capital structure (Dong et al., 2021). Furthermore, studies on emerging markets emphasise the influence of less stable inter-firm relationships on the liquidity-profitability nexus. This study addresses this gap by examining the relationship between financial liquidity and profitability among Polish public companies listed on the WSE.

This research hypothesises that the relationship between financial liquidity and profitability depends

on working capital management strategies (aggressive vs. conservative), sales levels, and asset size. Specifically, it is theorised that a company's operational characteristics, such as working capital management strategy, significantly influence the liquidity-profitability link. Companies adopting an aggressive strategy are expected to exhibit more dynamic operations and proactive liquidity management than those employing a conservative approach. Similarly, firm size is hypothesized to play a moderating role. Larger companies, potentially possessing greater access to capital markets, may exhibit less sensitivity to effective liquidity management than smaller firms, where such management can be a key driver of growth (Bolek, 2018). Through an analysis of WSE-listed company data, this article empirically examines the validity of theoretical assumptions regarding the interdependencies between liquidity and profitability. The categorisation of firms into portfolios based on working capital management strategies, sales, and asset levels verifies these theoretical underpinnings. This builds upon prior research examining the intricate relationship between liquidity and profitability to address existing gaps and empirically validate theoretical assumptions within the specific context of the WSE.

A significant challenge in this research area arises from the diverse approaches to defining and measuring financial liquidity. Liquidity encompasses multiple dimensions, including the ability to convert assets to cash, meet short-term obligations, generate cash flow, the speed of cash conversion, and the absolute level of cash holdings (Haro et al., 2023; Rezabala et al., 2023). The choice of liquidity measure influences the interpretation of results. While static ratios, often derived from balance sheet data, provide insights into working capital management, dynamic measures incorporate information from the income and cash flow statements. Research also highlights the importance and determinants of cash holdings (Anton, 2025). Furthermore, the direction of influence varies; for example, while increases in most static or cash flow-based liquidity measures suggest improved liquidity, an increase in the cash conversion cycle indicates a decrease in liquidity. The relationship between liquidity and profitability can be positive or negative, depending on the liquidity indicators (Bwacha & Xi, 2018). Profitability is assessed using return on assets and return on equity, which provide insights into a company's financial health (Olufemi & Olatise, 2020; Kumar & Joshi, 2019; Prasad, 2019; Samo & Murad, 2019; Iqbal, 2019; Hristova et al., 2019;

Abbas et al., 2019; Apostolos et al., 2019; Zamil et al., 2023; Markoná et al., 2020; Miranda & Fiel, 2022).

The relationship between liquidity and profitability has been extensively studied. Yet, existing research primarily focuses on diverse samples of companies at varying developmental stages and sizes, typically measured by sales and asset levels, often employing different operational strategies. A crucial gap remains in understanding how this relationship is modulated by a company's working capital management strategy, specifically the distinction between aggressive and conservative approaches in smaller and larger, more mature companies. This study addresses this gap by investigating the relationship between liquidity and profitability across distinct company groups categorised by size and operational dynamics, and crucially, by implemented working capital strategy. This nuanced approach offers a novel contribution to the literature. It provides insights into how the liquidity-profitability nexus varies depending on a firm's strategic choices regarding working capital management and their size, thereby shedding light on the complex factors influencing financial performance. This study aims to show that theoretical assumptions shape the dependence of liquidity and profitability on the Polish market.

The article is structured as follows: Following this introduction, a literature review is presented, followed by a description of the data and methodology. The research results are then presented, followed by a discussion and conclusions.

2. Literature Review

The relationship between liquidity and profitability has been a subject of extensive research, yielding a complex and often contradictory body of evidence. Early work suggested a negative trade-off: increased liquidity, measured by ratios like the current ratio and cash conversion cycle, comes at the cost of profitability. This view is echoed in some later studies (e.g., Eljelly, 2004; Wawryszuk-Misztal, 2007; Bolek et al., 2021), which further emphasise the importance of industry context and firm size as moderating factors. Specifically, Eljelly (2004) found the negative relationship more pronounced in firms with high current ratios and long cash conversion cycles, while firm size significantly impacted profitability at the industry level.

Prior research in Poland and internationally has yielded inconsistent findings regarding the strength and direction of the liquidity-profitability relationship, highlighting a need for more nuanced investigation into the moderating factors. Liquidity, which measures the ability to cover current obligations using current assets, has a positive and statistically significant effect on profitability (Nigussie, 2022; Mohammed, 2021; Mohanty & Mehrotra, 2018; Chasha et al., 2022; Ashbin & Sindhuja, 2021). On the other hand, the findings established in studies conducted and published by different researchers showed that liquidity does not affect profitability (Abdelaziz et al., 2020; Alarussi & Alhaderi, 2018; Martami & Panji, 2020).

However, the one-directional relationship is not universally supported. Mun and Jang (2018) proposed a parabolic relationship, suggesting an optimal liquidity level that maximises profitability. Tan and Tuluca (2023) further complicate the picture, demonstrating that the liquidity-profitability link can be positive or negative depending on the specific dataset. This ambiguity highlights the importance of contextual factors in shaping the relationship.

Research on Warsaw Stock Exchange (WSE)-listed companies reflects this broader debate. While some studies (e.g., Paździor, 2009; Bolek & Wolski, 2011; Wawryszuk-Misztal, 2013) have explored the relationship, often using various financial ratios, the findings remain inconclusive, with both positive and negative correlations reported. Kowerski (2016) even suggests an inverted U-shaped relationship for Polish public companies, indicating that profitability initially increases with liquidity up to a point, after which it declines. This inconsistency may be attributed to the dynamic nature of the WSE's developing market context, which is transitioning from a centrally controlled to a free market economy. As noted, a comprehensive analysis of the full 30-year period since this transition is crucial for understanding how competitive pressures have influenced these relationships. Pluskota et al. (2020) analysed the liquidity-profitability relationship with the Granger causality test on WSE-listed companies on the main and alternative markets. It was found that profitability has a greater influence on financial liquidity in both markets.

Further WSE-focused research has explored the influence of various factors, including working capital management strategies (Kuciński, 2017; Jaworski & Czerwionka, 2022; Bolek, 2016b), dividend payments and buyouts (Wrońska, 2010; Bukalska, 2013),

logistics (Rogaczewski, 2017), Economic Value Added (Bolek et al., 2012), stock prices and rates of return (Łon, 2009; Bolek & Wolski, 2012) and indebtedness (Lyroudi, 2021). Studies have also examined specific sectors, such as the food industry (Maślanka, 2003), chemical sector (Merta & Piosik, 2009; Kowalik, 2018), and mining and metallurgy industry (Nesterowicz et al., 2022), further emphasising the importance of industry-specific characteristics. Alom (2018) highlighted the long-term cointegration relationship between liquidity, profitability, firm size, and long-term debt, reinforcing the interconnectedness of these financial variables. Bolek (2016a) emphasises the role of managerial decisions in optimising current asset levels to maximise an enterprise's sales, profits and value. The Polish market seems well analysed, but the results in the changing environment may be inconclusive. The analysis of the dataset covering 30 years of the market may bring results that the theory can explain.

The trade-off theory suggests an inverse relationship between liquidity and profitability. The business life cycle theory suggests that a company's priorities change with its development stage, with profitability being more important in early stages and liquidity in later stages. Research has also identified moderators of the profitability-liquidity relationship, such as private sector credit and capital market development (Jaworski & Czerwionka, 2021), and the impact of firm size and liquidity management on profitability (Bagchi, 2013), which support the hypothesis tested in this research paper.

In conclusion, the literature on the liquidity-profitability relationship, particularly within the context of the WSE, reveals a complex and multifaceted dynamic. While some studies suggest a negative trade-off, others point to a more nuanced relationship, potentially moderated by factors such as firm size, industry, working capital management strategies, and macroeconomic conditions. The evolving nature of the WSE as a developing market further complicates the analysis. A comprehensive investigation considering these multiple dimensions is necessary to draw more definitive conclusions about the nature and strength of this crucial financial relationship.

3. Data and Methods

3.1 Data

The study is conducted on the annual data, derived from Notoria Service, of non-financial companies listed on the WSE since it began operating in 1991 until 2021.

This study employs a selection of fundamental financial indicators to assess both liquidity and profitability. Liquidity is evaluated from both static and dynamic perspectives. Static liquidity is operationalized using the current ratio (CR), calculated as the quotient of current assets and short-term liabilities. The CR indicates a firm's ability to meet its immediate obligations, and it is an indicator of net working capital strategy. The CR serves a dual purpose in this study. First, it informs the categorisation of companies based on their NWC management strategy, facilitating portfolio construction. Second, it functions as a static measure of liquidity for analysing the relationship between liquidity and profitability. Dynamic liquidity is assessed using the cash conversion cycle (CCC), which quantifies the number of days required to convert inventory into cash through operational activities. The CCC is calculated by summing days inventory outstanding (DIO) and days sales outstanding (DSO) and subsequently subtracting days payables outstanding (DPO). Consistent with prior research, this study acknowledges the importance of multiple liquidity dimensions. Two indicators were selected for profitability testing: return on equity (ROE) and return on assets (ROA). In addition, the analysis considered the volume of sales (S) and assets (A).

The tested hypothesis is that factors such as the net working capital management strategy, volume of sales, and size of assets affect the relationship between liquidity and profitability. First, the data were divided into portfolios based on the factors influencing this relationship. Table 1 presents the methodology for portfolio construction according to each specific factor.

The mean values of the data for the portfolios on the NWC strategies are presented in Table 2.

Statistical analysis makes it possible to identify differences among the surveyed groups. Companies with the highest sales levels exhibit the lowest level of liquidity in the static sense while demonstrating the highest liquidity in the dynamic sense. However,

Table 1. The construction of portfolios based on determinants

Factor	Range
Aggressive net working capital strategy	CR<1
Moderate net working capital strategy	CR <1;2>
Conservative net working capital strategy	CR>2
High level of sales	S > 1,204,375 (average value for a whole sample)
Low level of sales	S < 1,204,375 (average value for a whole sample)
High level of assets	A > 2,964,799 (average value for a whole sample)
Low level of assets	A < 2,964,799 (average value for a whole sample)

Source: Own study

Table 2. Mean values for portfolios related to net working capital strategies

	Aggressive strategy	Moderate strategy	Conservative strategy
No observations	509	650	573
S	1,845,840	1,468,680	340,971
A	7,131,500	15,457,106	893,946
ROE	-0.0303	0.057	0.0749
ROA	-0.1097	0.0282183	0.0577
CR	0.5874	1.41579	20.9465
CCC	7.2225	447.072	2315.95

Source: Own study

these same companies also tend to have the lowest profitability. Those with the highest level of assets implement a moderate strategy for managing NWC. The smaller the company in terms of sales and assets, the lower its liquidity and the higher its profitability.

In the next step, the portfolios representing the data based on the sales volume and asset levels were examined, and the results are presented in Table 3.

As a result, larger companies are characterised by lower liquidity in the static sense and higher liquidity in the dynamic sense, and they are also more profitable.

Table 3. Data statistics based on the sales and asset levels

	Sales < average	Sales > average	Assets < average	Assets > average
No observations	1467	203	1612	124
S	172,490	8,661,400	289,860	12,608,600
A	360,058	22,677,400	338,439	37,107,500
ROE	0.0324	0.1283	0.0320	0.1266
ROA	-0.0046	0.0375	-0.0076	0.0474
CR	8.5807	1.2657	8.1184	1.3483
CCC	55.0209	21.6628	50.6639	35.7730

Source: Own study

3.2 Methods

The study was carried out on the cross-sectional data of all yearly observations in the surveyed period. To examine the relationship between liquidity and profitability, we tested Spearman's nonparametric rho correlation coefficient and OLS models in the following forms:

$$ROE_t = a + a_1 CCC_t + a_2 A_t + e_t \quad (1)$$

$$ROA_t = a + a_1 CCC_t + a_2 A_t + e_t \quad (2)$$

$$ROE_t = a + a_1 CR_t + a_2 A_t + e_t \quad (3)$$

$$ROA_t = a + a_1 CR_t + a_2 A_t + e_t \quad (4)$$

$$ROE_t = a + a_1 CCC_t + a_2 S_t + e_t \quad (5)$$

$$ROA_t = a + a_1 CCC_t + a_2 S_t + e_t \quad (6)$$

$$ROE_t = a + a_1 CR_t + a_2 S_t + e_t \quad (7)$$

$$ROA_t = a + a_1 CR_t + a_2 S_t + e_t \quad (8)$$

Where: ROA – Return on assets, ROE – Return on equity, CR – Current ratio, CCC – Cash conversion cycle, A – Assets, S – Sales.

Model diagnostics included tests for normality of residuals and heteroscedasticity, where heteroscedasticity was detected, the models were corrected. Multicollinearity was assessed with Variance Inflation Factor (VIF) values consistently near 1, indicating no significant multicollinearity. Tests for normality (Chi-squared statistic) revealed that the

residual distributions were not normally distributed. This non-normality limits the generalizability of the findings and suggests avenues for future research.

4. Results

This section presents the results of the analysis. The analysis was conducted in three groups based on the factors influencing the relationship between financial liquidity and profitability under the theory that liquidity influences a company's profitability. The results for companies in the portfolios constructed according to their NWC management strategy, sales volume, and asset size are examined and presented in order.

4.1 Net Working Capital Strategy and the Liquidity–Profitability Relationship

The first step presents the portfolios of observations related to the NWC strategy. The nonparametric correlation matrix using Spearman's rho was calculated for the liquidity–profitability pairs of observations and presented in Table 4.

When CR is used as a static measure of liquidity, the liquidity–profitability relationship is positive for companies in the aggressive and moderate NWC management portfolios (although the correlation with ROE is not significant). In contrast, for companies with a conservative NWC strategy, the correlation between CR and profitability is negative. The correlation between the CCC and profitability is always negative

Table 4. Correlation matrix for portfolios based on NWC management

Aggressive strategy of NWC	CR	CCC
ROE	0.2163 ***	-0.2396 ***
ROA	0.3319 ***	-0.2152 ***
Moderate strategy of NWC	CR	CCC
ROE	0.0196	-0.1873 ***
ROA	0.1107 ***	-0.1396 ***
Conservative strategy of NWC	CR	CCC
ROE	-0.1722 ***	-0.1351 ***
ROA	-0.1248 ***	-0.1661 ***

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

and significant, indicating that a longer CCC, which represents reduced liquidity, is accompanied by a decrease in profitability.

The impact of liquidity on profitability was examined about the company's NWC management strategy. We first examined the aggressive strategy ; the results are presented in Table 5.

In the aggressive strategy model, where the CCC is the explanatory variable and assets are included as the control variable, the CCC's significant and negative impact on profitability , measured by both ROE and ROA, was found. Additionally, company size positively influenced profitability. A significant positive impact of CR on ROA was found in the model where CR is the explanatory variable. Company size also positively affected both ROE and ROA. The results of the OLS regressions are in line with the results of the correlation analysis.

The moderate NWC strategy was examined in the next step, and the results are presented in Table 6.

Table 5. OLS model for aggressive strategy and liquidity influencing profitability

Aggressive strategy CR<1							
Endogenous	Constant	CCC	lnA	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	-0.6374 ***	-0.00004 ***	0.0487 ***	0.0799	19.3458 ***	423	No
ROA	-0.3433 ***	-0.00004 ***	0.0249 ***	0.7777	819.7838 ***	469	Yes
Endogenous	Constant	CR	lnA	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	-0.8031 ***	0.1832	0.0532 ***	0.0461	11.6674 ***	442	Yes
ROA	-0.2784 ***	0.1671 **	0.0117 *	0.0159	5.0455 ***	500	Yes

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

Table 6. OLS model for moderate strategy and liquidity influencing profitability

Moderate strategy CR <1;2>							
Endogenous	Constant	CCC	lnA	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	0.0151	-0.000002 ***	0.0049	0.2222	90.8459 ***	630	Yes
ROA	0.0290	-0.00001 ***	0.0010	0.0755	26.8555 ***	634	Yes
Endogenous	Constant	CR	lnA	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	0.0029	0.0140	0.0042	0.0018	0.5951	635	Yes
ROA	-0.0584	0.0469 ***	0.0026	0.0096	4.1209 *	640	Yes

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

Table 7. OLS model for conservative NWC strategy and liquidity influencing profitability

Conservative strategy CR>2							
Endogenous	Constant	CCC	lnA	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	0.0084	0.000001	0.0076	0.0021	1.5601	513	Yes
ROA	0.1753 ***	0.000003 ***	-0.0079 **	0.0421	12.4182 ***	520	Yes
Endogenous	Constant	CR	lnA	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	-0.0828	0.000006	0.0147	0.0030	1.8209 *	541	Yes
ROA	0.0252	0.0002	0.0035	0.0009	1.2633	550	Yes

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

In the context of the moderate NWC management strategy, the CCC had a negative impact on profitability measures, while the CR had a significant positive impact on ROA. Notably, none of the models indicated a significant impact of company size on profitability. The moderate strategy is a transition strategy between this study's aggressive and conservative strategies.

The next step involved examining the portfolio with companies with a conservative NWC strategy, and the results are presented in Table 7.

In the case of the conservative strategy of NWC, the impact of liquidity on profitability is less significant. Only CCC positively impacts ROA, while company size negatively affects ROA. It can be concluded that, within the group of companies adopting a conservative approach to NWC, the impact of liquidity on profitability for both static and dynamic approaches is positive but, in most cases, not significant.

4.2 Sales and the Liquidity–Profitability Relationship

The next step is to analyse the impact of the sales level on the liquidity–profitability relationship. The results of the correlation matrix are presented in Table 8.

The correlation analysis shows that the relationship between CR and profitability ratios was positive, regardless of sales volume. However, this correlation is lower in companies with lower sales. The relationship between ROE and ROA with the CCC is negative and statistically significant only in companies with lower sales.

Table 8. Correlation matrix for portfolios based on sales levels

Sales < average	CR	CCC
ROE	0.1386 ***	-0.0748 ***
ROA	0.2513 ***	-0.0514 ***
Sales > average	CR	CCC
ROE	0.1969 ***	-0.0672
ROA	0.3528 ***	0.0426

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

In the next step, we examine the impact of liquidity measures on profitability ratios in relation to the lower-than-average sales volume, and the results are presented in Table 9.

In the group of companies characterised by lower sales levels, the CCC had a negative impact on all profitability measures. Additionally, for ROA, assets had a positive and statistically significant impact on profitability. CR positively impacted ROE, ROA, and the size of assets. The results are in line with the correlation analysis.

In the next step, we examine the impact of liquidity measures on profitability ratios in relation to higher-than-average sales volumes, and the results are presented in Table 10.

Table 9. OLS model for lower-than-average sales and liquidity influencing profitability

Sales < average							
Endogenous	Constant	CCC	lnA	Adj. R ²	F-stat	N	Heteroskedasticity-corrected
ROE	-0.0519	-0.00005 ***	0.0084	0.9799	33383.3 ***	1365	Yes
ROA	-0.1053 **	-0.000001 ***	0.0113 ***	0.8613	4418.782 ***	1423	Yes
Endogenous	Constant	CR	lnA	Adj. R ²	F-stat	N	Heteroskedasticity-corrected
ROE	-0.0952	0.0001 **	0.0120 *	0.0039	3.7423 **	1372	Yes
ROA	-0.1668 ***	0.0003 *	0.0162 ***	0.0085	7.1338 *	1431	Yes

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

Table 10. OLS model for higher-than-average sales levels and liquidity that influences profitability

Sales > average							
Endogenous	Constant	CCC	lnA	Adj. R ²	F-stat	N	Heteroskedasticity-corrected
ROE	0.4132	-0.0004	-0.0181	0.0081	1.8168	201	No
ROA	0.0620	0.00006	-0.0016	0.0059	0.5885	201	No
Endogenous	Constant	CR	lnA	Adj. R ²	F-stat	N	Heteroskedasticity-corrected
ROE	0.4003 *	-0.0167	-0.0164	0.0085	0.8506	201	No
ROA	0.0300	0.0296 **	-0.0019	0.0696	0.0696 **	201	No

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

In enterprises with high sales levels, only liquidity in the static sense positively affects ROA. Size does not influence profitability in any of the cases.

1.3. Assets and the Liquidity–Profitability Relationship

The next step analyses the impact of asset levels on the liquidity–profitability relationship. The results of the correlation matrix are presented in Table 11.

In the group of smaller enterprises, a significant positive relationship between CR and profitability was found, along with a negative one with the CCC. For large companies, only the correlation between ROA and CR is positive and stronger than the other results in this sample.

Table 11. Correlation matrix for portfolios based on asset levels

Assets < average	CR	CCC
ROE	0.1195 ***	-0.0754 ***
ROA	0.2406 ***	-0.0452 ***
Assets > average	CR	CCC
ROE	0.1154	-0.1021
ROA	0.3069 ***	0.0332

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

Table 12. OLS model for lower-than-average asset levels and liquidity's influence on profitability

Assets < average							
Endogenous	Constant	CCC	lnS	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	-0.2268 ***	0.00004 ***	0.0252 ***	0.5769	984.2930 ***	1443	Yes
ROA	-0.0968 ***	-0.000007 ***	0.0114 ***	0.0967	81.3111 ***	1501	Yes
Endogenous	Constant	CR	lnS	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	-0.2357 ***	0.0004 **	0.0258 ***	0.0243	18.9958 ***	1443	Yes
ROA	-0.1218 ***	0.0005 **	0.0132 ***	0.0156	12.8943 ***	1500	Yes

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

Table 13. OLS model for higher-than-average levels of assets and liquidity's influence on profitability

Assets > average							
Endogenous	Constant	CCC	lnS	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	0.1112	0.0002	0.0003	0.0112	0.6802		
ROA	0.1006 *	0.00002	-0.0040	0.0115	0.6993	123	Yes
Endogenous	Constant	CR	lnS	Adj. R²	F-stat	N	Heteroskedasticity-corrected
ROE	0.2900	-0.0286	-0.0081	0.007	0.4690	123	No
ROA	0.1972 ***	0.0021	-0.0100 **	0.0256	2.6052 ^	123	No

It was assumed that the parameter was statistically significant for any p-value less than 0.1, corresponding to increasing confidence intervals of 1% (*), 5% (**), and 10% (***).

Source: Own study

In the next step, we examine the impact of liquidity measures on profitability ratios for companies with lower-than-average asset levels, and the results are presented in Table 12.

The CCC had a significant and negative impact on ROA and a positive impact on ROE. For CR, a positive impact on both ROE and ROA was observed. In all models, sales levels positively influenced profitability.

In the next step, we examine the impact of liquidity measures on profitability ratios in companies with higher-than-average asset levels, with the results presented in Table 13.

No significant impact of liquidity on profitability was found in the group of large enterprises; only sales volume had a negative impact on ROA in this portfolio of companies.

4. Discussion

Studies examining the relationship between corporate liquidity and profitability have yielded complex and often ambiguous results. While offering novel insights, the portfolio-based approach adopted in this study makes direct comparison with prior findings challenging. Our findings regarding the impact of net working capital (NWC) management strategies partially align with existing research. We confirm the established trade-off: companies with aggressive NWC strategies (lower current assets relative to sales) can achieve higher profitability at the cost of lower liquidity, while those with conservative strategies (higher current assets) enjoy greater financial security but potentially lower profitability.

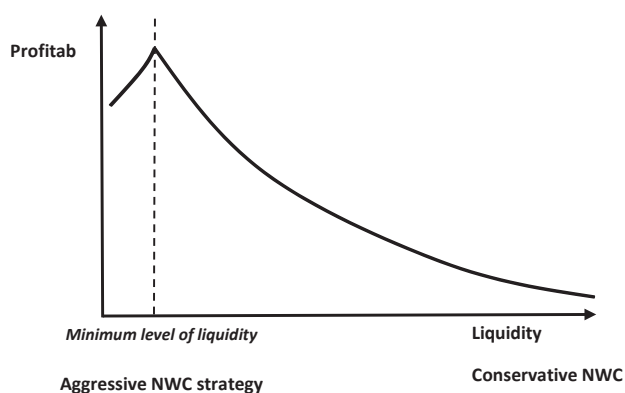


Figure 1. The relationship between liquidity and profitability
Source: Own elaboration based on Gajdka, J. (2000). *Zarządzanie finansowe: teoria i praktyka* (Vol. 2). Fundacja Rozwoju Rachunkowości w Polsce, p. 467

Furthermore, our research supports the established influence of firm size (measured by sales and assets) on the liquidity-profitability relationship. However, unlike some prior studies, we did not observe a universally clear-cut relationship between these two variables. Instead, our results reveal a nuanced picture: increased liquidity is associated with increased profitability only within firms employing an aggressive NWC strategy. Conversely, the opposite relationship is observed in firms with a conservative NWC approach.

Specifically, the relationship between financial liquidity (measured by the current ratio, CR) and profitability (measured by return on equity, ROE) varies across portfolios categorized by NWC strategy, sales volume, and asset level. While generally positive, the CR-ROE relationship turns negative in companies pursuing a conservative NWC strategy, indicating that higher static liquidity negatively correlates with ROE in this group. The relationship between financial liquidity and the cash conversion cycle (CCC) is consistently negative. Notably, the relationship between financial liquidity and profitability is statistically insignificant for companies with above-average asset levels, suggesting that large companies may not efficiently manage liquidity to maximise shareholder value. Within the aggressive NWC strategy group, the CR-ROE relationship is negative, consistent with the theoretical trade-off.

Similarly, the relationship between financial liquidity and profitability (measured by return on assets, ROA) also varies across portfolios. The relationship between financial liquidity and CCC is generally negative but becomes statistically insignificant and

even positive in high-sales companies. The ROA-CR relationship is generally positive, becoming negative only in companies with an aggressive NWC strategy, again consistent with the theoretical trade-off.

Instead of comparing the results to numerous previous studies, which show different results, it was decided to compare them with the theoretical assumptions of liquidity and profitability. The general theoretical relationship, as depicted in Figure 1, posits an initial positive correlation, where profitability (both ROE and ROA) increases with liquidity up to an optimal point. Beyond this point, further increases in liquidity are theorised to decrease profitability.

The theoretical assumptions depicted in Figure 1 were not consistently supported by the existing literature, which reports positive and negative relationships between liquidity and profitability measures. However, the portfolio-based approach employed in this study allowed for empirical verification of these theoretical underpinnings. Specifically, categorising companies by NWC management strategy revealed distinct patterns. Among companies employing an aggressive NWC strategy, increased liquidity was positively associated with increased profitability. Conversely, companies pursuing a conservative NWC strategy exhibited an inverse relationship between these variables.

The relationship between the current ratio (CR) and profitability was consistently positive and statistically significant within the low and high revenue portfolios. The relationship between the cash conversion cycle (CCC) and profitability was only significant and negative for small companies. In these smaller firms, increasing current assets or decreasing short-term liabilities (thereby improving the CR) enhances profitability, potentially through a reduction in the CCC. This observation, however, does not hold for companies employing a conservative NWC strategy, where decreasing NWC (and thus, presumably, the CCC) leads to increased profitability.

The models for the aggressive NWC strategy demonstrated the strongest explanatory power, suggesting that liquidity and profitability management are most effective among these enterprises. This finding implies a more direct and responsive management of the trade-off between liquidity and profitability within this group. In contrast, the relationship between liquidity and profitability was largely insignificant for companies with high asset levels, suggesting that larger enterprises may prioritise liquidity and profitability management less actively.

5. Summary

This study analysed the relationship between liquidity and profitability among WSE-listed non-financial firms (1991-2021), categorising firms by NWC strategy (aggressive, moderate, conservative), sales, and asset size. Analysis revealed a contingent relationship dependent on these factors. Specifically, the CR's relationship with ROE and ROA was positive for aggressive/moderate NWC strategies and negative for conservative strategies. Larger firms tended towards more aggressive NWC policies and higher dynamic liquidity. The hypothesis that the liquidity-profitability relationship depends on NWC strategy, sales, and asset size was supported. This study contributes by empirically demonstrating this complex interplay in the Polish market, challenging theoretical assumptions and enabling the comparison with other emerging markets. Findings offer practical guidance for financial managers and investors and insights into emerging market dynamics. Future research should include sector-specific analyses and consider more advanced econometric techniques.

References

- Abbas, F., Iqbal, S., Aziz, B., & Yang, Z. (2019). The Impact of Bank Capital, Bank Liquidity and Credit Risk on Profitability in Postcrisis Period: A Comparative Study of US and Asia. *Cogent Economics & Finance*, 7(1), 1-18. <https://doi.org/10.1080/23322039.2019.1605683>
- Abdelaziz, H., Rim, B., & Helmi, H. (2020). The Interactional Relationships Between Credit Risk, Liquidity Risk and Bank Profitability in MENA Region. *Global Business Review*, 23(3), 1-11. <https://doi.org/10.1177/0972150919879304>
- Alarussi, S., & Alhaderi, S. (2018). Factors Affecting Profitability in Malaysia. *Journal of Economic Studies*, 45(3), 442-458. <https://doi.org/10.1108/JES-05-2017-0124>
- Alom, K. (2018). Liquidity and Profitability: A Cointegration Study. *Review of Pacific Basin Financial Markets and Policies*, 21(02), 1850011.
- Anton, S. G. (2019). Firm Value and Corporate Cash Holdings. *Empirical Evidence from the Polish Listed Firms*, XXI, 3, 121-134, <https://doi.org/10.15240/tul/001/2019-3-008>
- Anton, S.G. (2025). The Efficiency of Financial Intermediation and SMEs' Cash Holdings: Empirical Evidence from Emerging Europe. *European Journal of International Management (EJIM)*, Vol. 25, No. 2, <https://doi.org/10.1504/EJIM.2025.143873>
- Apostolos, G., Ioannis, G., Petros, K., & Koukkou, T. (2019). Investigation of Financial Distress with a Dynamic Logit Based on the Linkage Between Liquidity and Profitability Status of Listed Firms. *Journal of the Operational Research Society*, 70(10), 1817-1829. <https://doi.org/10.1080/01605682.2018.1460017>
- Ashbin, M., & Sindhuja, M. (2021). Analyze Liquidity and Profitability in Organization. *PalArch's Journal of Archaeology of Egypt / Egyptology*, 18(8), 4415-4424. <https://archives.palarch.nl/index.php/jae/article/view/9683>
- Bagchi, B. (2013). Liquidity-Profitability Relationship: Empirical Evidence From Indian Fast Moving Consumer Goods Firms. *International Journal of Applied Management Science*, 5(4), 355-376.
- Bolek, M. (2016a). Wpływ Płynności na Efektywność Działania Przedsiębiorstw Notowanych na NewConnect. *Finanse, Rynki Finansowe, Ubezpieczenia*, (82 (2)), 13-30.
- Bolek, M. (2016b). Struktura Aktywów i Jej Związek z Rentownością i Płynnością Finansową Przedsiębiorstwa na Przykładzie Spółek Notowanych na NewConnect, *Acta Universitatis Lodzensis. Folia Oeconomica*, 2016, 6, 45-66.
- Bolek, M. (2018). *Determinanty wzrostu przedsiębiorstw na rynku kapitałowym*. Wydawnictwo Uniwersytetu Łódzkiego.
- Bolek, M., Kacprzyk, M., & Wolski, R. (2012). The Relationship Between Economic Value Added and Cash Conversion Cycle in Companies Listed on the WSE. *e-Finanse: Financial Internet Quarterly*, 8(2), 1-10.
- Bolek, M., Pluskota, A., & Wolski, R. (2021). Liquidity-Profitability Trade-Off on the Example of Companies Listed on Main and Alternative New Connect Markets on Warsaw Stock Exchange. *Finanse i Prawo Finansowe*, (Numer Specjalny), 7-24.
- Bolek, M., & Wolski, R. (2011). Związek Cyklu Konwersji Gotówki ze Wskaźnikami Płynności Przedsiębiorstw Notowanych na GPW w Warszawie. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 158, 28-37.
- Bolek, M., & Wolski, R. (2012). Profitability or Liquidity: Influencing the Market Value. The Case of

Poland. *International Journal of Economics and Finance*, 4(9), 182-190.

Bukalska, E. (2013). Rentowność i Płynność a Dywidendy i Wykupy Akcji. *Zarządzanie i Finanse*, 2(2), 31-42.

Bwacha, C. R., & Xi, J. (2018). The Impact of Liquidity on Profitability: An Explanatory Study of the Banking Sector Between 2008 and 2017.

Chasha, F., Kavele, M., & Guandaru, C. (2022). Working Capital Management, Liquidity and Financial Performance: Context of Kenyan SME's. *SSRN*, 1(1), 1-10. <https://dx.doi.org/10.2139/ssrn.4038724>

Dong, J., Karhade, P., Rai, A., & Xin, S. (2021). How Firms Make Information Technology Investment Decisions: Toward a Behavioral Agency Theory. *Journal of Management Information Systems*, 38(1), 29-58. <https://doi.org/10.1080/07421222.2021.1870382>

Eljelly, A. M. (2004). Liquidity-Profitability Tradeoff: An Empirical Investigation in an Emerging Market. *International Journal of Commerce and Management*, 14(2), 48-61.

Gajdka, J. (2000). *Zarządzanie finansowe: teoria i praktyka* (Vol. 2). Fundacja Rozwoju Rachunkowości w Polsce.

Haro, A., Carranza, M., López, O., Mayorga, C., & Morales, K. (2023). Razones Financieras de Liquidez y Actividad: Herramientas Para la Gestión Empresarial y Toma de Decisiones. *LATAM Revista Latinoamericana de Ciencias Sociales y Humanidades*, 4(1), 2405-2418. <https://doi.org/10.56712/latam.v4i1.425>

Hristova, S., Stevcevska, D., Mileva, I., & Zafirova, A. (2019). Trade-Off Between Liquidity and Profitability: An Empirical Study of Pharmaceutical Sector in The Republic Of North Macedonia. *Sciend*, 12(2), 127-148.

Iqbal, J. (2019). The Relationship between Liquidity and Profitability. *Journal of Finance and Accounting*, 7(1), 22-27.

Jaworski, J., & Czerwonka, L. (2021). Meta-Study on the Relationship Between Profitability and Liquidity of Enterprises in Macroeconomic and Institutional Environment. *Decision*, 48(2), 233-246.

Jaworski, J., & Czerwonka, L. (2022). Profitability and Working Capital Management: Evidence From the Warsaw Stock Exchange. *Journal of Business Economics and Management*, 23(1), 180-198.

Kowalik, M. (2018). Profitability and Financial Liquidity of the Chemical Industry Companies. *Finanse, Rynki Finansowe, Ubezpieczenia*, (91), 47-58.

Kowerski, M. (2016). Zależność Między Rentownością a Płynnością Finansową Ma Kształt Odwrotnego U. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, (440), 338-348.

Kuciński, A. (2017). Strategie Zarządzania Kapitałem Obrotowym Netto w Przedsiębiorstwie na Przykładzie Wybranych Spółek Notowanych na GPW w Warszawie, <https://depot.ceon.pl/handle/123456789/15202>.

Kumar, A., & Joshi, V. (2019). Liquidity and Profitability Relationship and Financial Fallacy. *Think India Journal*, 22(10), 704-718. <https://thinkindiaquarterly.org/index.php/think-india/article/view/10899/6608>

Lyrouti, K. (2021). Examination of the Liquidity, Profitability and Indebtness Relations for Polish Companies with Neural Networks. In *Global, Regional and Local Perspectives on the Economies of Southeastern Europe: Proceedings of the 11th International Conference on the Economies of the Balkan and Eastern European Countries (EBEEC) in Bucharest, Romania, 2019* (pp. 135-151). Springer International Publishing.

Łon, E. (2009). Płynność i Rentowność a Zmiany Kursów Akcji Spółek Sektora Budowlanego Notowanych na GPW w Warszawie w Latach 1998-2007. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, (60 Inwestycje finansowe i ubezpieczenia-tendencje światowe a polski rynek), 277-284.

Markoná, M., Salim, A., & Francisca, J. (2020). Effect of Profitability, Leverage, and Liquidity to the Firm Value. *DJFEFA*, 1(1), 83-94. <https://doi.org/10.38035/djefa.v1i1.225>

Martami, I., & Panji, I. (2020). Profitability and Liquidity on Firm Value and Capital Structure as Intervening Variable. *International Research Journal of Management, IT & Social Sciences*, 7(1), 116-127. <https://doi.org/10.21744/irjmis.v7n1.828>

Maślanka, T. (2003). Zależności Między Płynnością a Rentownością na Przykładzie Spółek z Branży Spożywczej Notowanych na GPW w Warszawie za Okres 1998-2002. *Sprawozdawczość i Rewizja Finansowa w Procesie Podnoszenia Kwalifikacji Kadry Menedżerskiej*, 445-454.

Miranda, A., & Fiel, J. (2022). Financial Stability, Liquidity and Profitability as Indicators Toward the

Viability of Non-Life Insurance Companies in the Philippines. *Pacha*, 3(8), 1-16. <https://doi.org/10.46652/pacha.v3i8.116>

Merta, Ł., & Piosik, A. (2009). Związek Między Rentownością a Płynnością Finansową na Przykładzie Spółek Branży Chemicznej. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, (56 Rachunkowość a controlling), 312-321.

Mohammed, E. (2021). The Determinants of Bank Profitability of GCC: The Role of Bank Liquidity as Moderating Variable—Further Analysis. *International Journal of Finance & Economics*, 28(2), 1423-1435. <https://doi.org/10.1002/ijfe.2485>

Mohanty, B., & Mehrota, S. (2018). Relationship between Liquidity and Profitability: An Exploratory Study of SMEs in India. *Emerging Economy Studies*, 4(2), 1-13. <https://doi.org/10.1177/2394901518795069>

Mun, S. G., & Jang, S. S. (2018). Restaurant Operating Expenses and Their Effects on Profitability Enhancement. *International Journal of Hospitality Management*, 71, 68-76.

Nesterowicz, R., Nakonieczny, J., & Nesterowicz, A. (2022). Znaczenie Oceny Płynności i Rentowności w Aspekcie Zagrożenia Ryzykiem Upadłości Przedsiębiorstw na Przykładzie Branży Górniczo-Hutniczej. *Przedsiębiorczość-Edukacja*, 18(1), 18-30.

Nigussie, Y. (2022). Determinants of Banks' Profitability: Empirical Evidence From Banks in Challenges in the Relationship Between Liquidity and Profitability: Perspectives From a Literature Review Ethiopia. *Cogent Economics & Finance*, 10(1), 1-15. <https://doi.org/10.1080/23322039.2022.2031433>

Olufemi, A., & Olatise, F. (2020). Impact of Liquidity Management on Profitability of Selected. *European Journal of Business and Management*, 12(27), 93-99. https://www.researchgate.net/profile/Olufemi-Adesina/publication/344648327_Impact_of_Liquidity_Management_on_Profitability_of_Selected_Manufacturing_Firms_in_Nigeria/links/5f86c7b4a6fdccfd7b5fd37c/Impact-of-Liquidity-Management-on-Profitability-of-Selected

Paździor, A. (2009). Zależność Między Płynnością a Rentownością Spółek Notowanych na GPW w Warszawie. *M. Sierpińska (red.), Zarządzanie Finansami we Współczesnych Przedsiębiorstwach*. Warszawa: Vizja Press & IT.

Pluskota, A., Bolek, M., & Wolski, R. (2020). Liquidity–Profitability Relationship Analysed With

the Granger Causality Test on the Example of the Warsaw Stock Exchange. *Annales Universitatis Mariae Curie-Skłodowska, Sectio H–Oeconomia*, 54(2), 89-101.

Prasad, S. (2019). Impact of Liquidity on Profitability in Nepalese Commercial Bank. *Patan Pragma*, 5(1), 180-187. <https://doi.org/10.3126/pragma.v5i1.30458>

Rezabala, A., De La Cruz, A., Pinargote, N., & Cedeño, J. (2023). Capital Circulante, Liquidez y Apalancamiento en la Rentabilidad del Taller de Cuero Venturo, Portoviejo, Ecuador. *LATAM Revista Latinoamericana De Ciencias Sociales Y Humanidades*, 4(1), 1347-1360. <https://doi.org/10.56712/latam.v4i1.343>

Rogaczewski, R. (2017). Wpływ Logistyki na Rentowność i Płynność Finansową Przedsiębiorstwa. *Dylematy i Perspektywy Rozwoju Finansów i Rachunkowości*, 35.

Samo, A., & Murad, H. (2019). Impact of Liquidity and Financial Leverage on Firm's Profitability – An Empirical Analysis of the Textile Industry of Pakistan. *Research Journal of Textile and Apparel*, 23(4), 291-305. <https://doi.org/10.1108/RJTA-09-2018-0055>

Tan, X., & Tuluca, S. A. (2023). Liquidity and Profitability: Not a One Size Fits All Proposition! *Accounting and Management Information Systems*, 22(1), 42-58.

Wawryszuk-Misztal, A. (2007). Strategie Zarządzania Kapitałem Obrotowym Netto w Przedsiębiorstwach: Studium Empiryczno-Teoretyczne. *Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej*.

Wawryszuk-Misztal, A. (2013). Cykl Handlowy Netto a Rentowność Przedsiębiorstw Przemysłowych Notowanych na Giełdzie Papierów Wartościowych w Warszawie. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, (321), 182-189.

Wrońska, E. M. (2010). Rentowność i Płynność Finansowa a Wyплаты Dywidend Gotówkowych. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, Finanse Przedsiębiorstw*, 98, 397-404.

Zamil, I., Ramakrishnan, S., Jamal, N., Hatif, M., & Khatib, S. (2023). Drivers of Corporate Voluntary Disclosure: A Systematic Review. *Journal of Financial Reporting and Accounting*, 21(2), 232-267. <https://doi.org/10.1108/JFRA-04-2021-0110>