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Working Capital Management through the Business Cycle: Evidence from the Corporate Sector in Poland

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ABSTRACT The paper examines the influence of the business cycle on working capital management strategies based on evidence from the Polish corporate sector. By exploring the interrelation between working capital investment and profitability ratios, we attempt to define the respective transmission mechanisms and summarize the principles of sound financial management across the economic cycle. We found that more profitable companies tend to implement a more conservative working capital management strategy during recessions and that underperforming firms may be urged to cut working capital in response to plummeting cash flows. The accumulation of precautionary cash reserves appears to help firms navigate through times of economic turmoil. The paper highlights the importance of working capital management for optimizing a firm's profitability. Research outcomes may point to the redistributive function of trade finance under conditions of financing constraints, which become particularly acute during troughs aggravated by a credit market crunch.

KEY WORDS: working capital, business cycle, profitability

JEL Classification: G32

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1. Introduction

Efficient working capital management represents an important tool for optimizing a firm's liquidity and exploiting its value-creating potential (Ferrando & Mulier, 2013). We investigate the influence of economic slump on the working capital management strategy by analyzing the interrelation between a firm's profitability ratios and working capital investment dynamics.

Theoretical and empirical evidence suggests that capital market imperfections may have important consequences for corporate decision-making (Fazzari, Hubbard, Petersen, Blinder, & Poterba, 1988; Moyen, 2004; Myers & Majluf, 1984). In the context of financing constraints theory, the analysis of economic crisis settings represents a case of particular interest, as troughs may considerably limit access to external finance and exacerbate the deficiency in internal sources of cash flows. In turn, impaired financing capacity may significantly alter the patterns of working capital investment, which may be used to temporarily improve liquidity and even substitute for other sources of finance (Fazzari & Petersen, 1993).

The 2008 financial crisis became a natural economic experiment allowing deeper insights into corporate practices under conditions of an overall downturn.

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The research literature barely discusses the problems of working capital management through the business cycle. This paper attempts to fill this research gap by presenting findings for the Polish corporate sector. The paper is structured as follows: first, we offer an overview of existing research; second, we elaborate research hypotheses and present empirical results accompanied by a discussion of implications for operational and tactical decision-making at the firm level.

2. Theoretical Overview

Several studies (e.g., Chiou, Cheng, & Wu, 2006; Ng, Smith, & Smith, 1999) have explored the determinants of working capital investment in an attempt to formulate the postulates of an optimal management strategy allowing one to secure a company's solvency and ensure the smooth workflow of business operations. Existing empirical literature suggests that financing constraints and phases of the business cycle are among the key factors influencing the modes of working capital finance.

Aktas, Croci, and Petmezas (2015) studied the value relevance of working capital management strategy in a sample of US companies and reported the existence of an optimal level of working capital investment. Gradual transition to the optimum allows one to secure superior operating performance and gains in shareholder value. Additionally, spare resources released by optimization of working capital management may be used to finance positive-NPV projects such as acquisitions.

2.1. Impact of Financing Constraints on Working Capital Management

Petersen and Rajan (1997) suggest that trade finance may perform a redistributive function by channeling credit resources from less financially constrained companies, which have a better access to capital markets, to more vulnerable firms. Hence, trade credit substitutes for external finance in companies facing information asymmetry problems. Additionally, financially sound companies were found to grant relatively more trade credit, which may be attributed to their willingness to secure future business, lower degree of information asymmetry and reliance on secured credit backed by goods purchased. Similar findings are reported by Cuñat (2007) for UK companies: in order to preserve customer relationships, firms may be willing to relax trade credit conditions, thereby effectively cushioning the cash flow constraints faced by their customers and alleviating the problem of limited access to capital markets.

Nilsen (2002) reports findings that may question the redistributive function of trade credit, since both small and large firms are reported to increase reliance on trade finance during negative monetary shocks accompanied by a credit crunch. On the other hand, the postulates of financing constraints theory hold with large companies recurring to external borrowing to a greater extent than small companies experiencing a cash shortage. Yang (2011) concludes that during the periods of monetary contraction companies tend to substitute trade credit for bank loans due to the increased cost of external capital, while during monetary expansion trade finance and bank loans appear to exhibit a complementarity effect. The same study reports a high sensitivity of inventory investment to exchange rate fluctuations for financially constrained companies.

Casey and O'Toole (2014) analyzed the lending patterns of SMEs in the Eurozone and concluded that financially constrained companies were more likely to rely on trade finance, recur to intercompany credit financing and apply for grants.

Opler, Pinkowitz, Stulz, and Williamson (1999) examined the cash holding patterns based on US firm-level data. Companies with significant growth potential and volatile cash flows tended to hold larger stocks of cash. These companies were more likely to experience financing constraints. On the other hand, firms with investment credit rating tended to hold relatively smaller amounts of cash. Evidence suggests that the principal cash-holding motive of constrained companies may be that of compensating for potential operating losses. Since an economic downturn may induce a considerable fall in sales, holding precautionary cash reserves appears to be a sound decision.

2.2. Influence of Working Capital Management on Profitability

Deloof (2003) analyzed the influence of working capital management on the profitability of Belgian companies. The reduction of receivables and inventory turnover periods were found to improve companies' operating performance. The study also found a nega-

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tive relationship between operating profit and account payables, which may be explained by reversed causality: underperforming companies short of funds require more time to pay their suppliers.

For a set of Finnish companies, Enqvist, Graham, and Nikkinen (2014) found a negative relationship between a firm's profitability, measured by gross operating income and return on assets, and the cash conversion cycle, with the effect being particularly pronounced during an economic crisis. A negative relationship was also found between profitability and accounts payable days as well as between profitability and inventory levels. The effects were more pronounced during an economic slump. The results suggest that in order to alleviate the negative consequences of unfavorable conjuncture, management should try to minimize receivables and inventories and extend accounts payable days.

Garcia-Teruel and Martinez-Solano (2007) report a negative relationship between cash conversion cycle and profitability: a reduction of inventories and accounts receivable appears to improve KPIs. Based on data from the Portuguese corporate sector, Pais and Gama (2015) conclude that an application of a more aggressive working capital management strategy by SMEs may enhance their operating performance. Additionally, reduction in accounts payable days was found to positively influence profitability, which resonates with previously cited evidence.

By examining the data for the food industry in Poland and in Eurozone countries, Bieniasz and Gołaś (2011) corroborated a negative relationship between cash conversion cycle and profitability. Large companies in the Polish food industry were manifesting the highest efficiency in managing their working capital and were concomitantly the best performers in terms of profitability. Based on data from the Polish stock market, Bolek (2013) concluded that there was no correlation between working capital management policy and profitability ratios.

2.3. Working Capital Management under Conditions of Economic Turmoil

Campello, Graham, and Harvey (2010) used qualitative research methodology to determine the influence of financing constraints on corporate decision-making during the 2008 financial crisis. The companies labeled as financially constrained were more prone to cut investment expenditures, deplete precautionary cash reserves, rely on credit lines and external financing, and sell assets in order to compensate for internal funds deficiency. Additionally, due to restricted access to external finance, constrained companies reported having missed attractive investment opportunities.

Love, Preve, and Sarria-Allende (2007) studied the influence of credit contraction during the 1997 crisis in Asia on the dynamics of trade finance in emerging economies. Crisis outbreak was found to be accompanied by a trade credit expansion followed by subsequent gradual decay. The authors conclude that the contraction had a supply-side origin whereby financial constraints forced the companies to slash trade finance in order to preserve liquidity. The same study reports that companies which experienced a cash flow shortage and largely depended on short-term debt financing were more likely to cut back on trade credit and increase trade payables.

Gertler and Gilchrist (1994) found that large and small companies react differently to monetary policy shocks. Large companies tend to be heavily dependent on short-term debt financing, which gradually increases through the phase of economic growth and subsequently falls following the outbreak of an economic slump. Small companies exhibit more conservatism and start slashing short-term debt before the recession begins. Small firms are also found to disproportionately reduce inventory expenditures compared to large companies. In line with findings by Fazzari and Petersen (1993), this may suggest that financially constrained companies may use working capital as a reserve of liquidity, which may temporarily make up for the internal cash flow deficiency.

The advent of a financial crisis may cause substantial shifts in a firm's strategic positioning, with the more financially sound companies benefitting at the expense of the more fragile ones. Baskin (1987) argues that companies may hold additional amounts of cash as a deterrent for potential entrants. The cash reserves may become a worthy argument in the competitive rivalry.

The problematics of working capital management through the business cycle in the emerging market settings appear to have been insufficiently explored. The Polish market is dynamically developing and may exhibit features divergent from the patterns generally

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observed in mature markets. Additionally, empirical evidence suggests that Polish companies may be confronted with significant financing constraints (Jackowicz, Kozłowski, & Mielcarz, 2016), which may exercise a negative impact on their investment policy during economic turmoil (Jackowicz & Mielcarz, 2015). The paper, therefore, contributes to the general discussion of working capital management, with a particular focus on the impact of economic cycle on managerial decision-making.

3. Hypothesis Development

Working capital investment is influenced by three principal considerations: maintaining uninterrupted workflow of operations, ensuring sufficient liquidity and solvency, and optimizing profitability of investment. Hence, firms constantly face important tradeoffs in regard to determining the structure of working capital. Expansion of a company's operations induces an increase in working capital investment. Conservative management of inventories allows for the reduction of ordering costs, secure purchase discounts, and elimination of the risk of stock-outs (Corsten & Gruen, 2004). On the other hand, aggressive inventory management and implementation of a just-in-time system reduces holding costs, the risk of obsolescence and pilferage. Relaxing terms of trade credit may allow firms to increase sales and secure future business by improving customer relationships (Summers & Wilson, 2002). Simultaneously, the proportion of bad debts and the overall credit risk increase. An increase in trade payables days may help to improve short-term liquidity; however, this most certainly jeopardizes a firm's relationship with suppliers. In addition, additional investment in working capital diverts limited financial resources from other productive uses, which poses the problem of trade-off between liquidity and profitability. Conservative management sets sufficiency of working capital investment as a priority, while aggressive strategies help to maximize profitability (Kieschnick, Laplante, & Moussawi, 2013). This line of reasoning allows us to formulate the following hypothesis H1.

H1: Conservative working capital management strategy reduces a firm's profitability.

H1 will be tested for each element of working capital investment separately, i.e., for investment in account receivables (H1.1), trade payables (H1.2), inventories (H1.3) and cash reserves (H1.4).

The situation may look different during economic turmoil. Due to external shocks (demand-side translating into decreased sales, or supply-side causing production costs to rise), the corporate sector experiences a shortage of internal finance. In an overall economic slump, capital market imperfections and the problem of information asymmetry are amplified by uncertainty, and financing constraints become tighter. Under these circumstances, companies face the following trade-offs. On the one hand, due to restricted access to external financing, the firm may treat working capital as a liquidity reserve and deplete it in order to compensate for the temporary insufficiency of operating cash flows. This implies an implementation of an aggressive working capital management strategy: pressure for receivables collection, sale of excess inventories and withdrawal of outstanding purchase orders, delays in payments to suppliers and depletion of cash reserves to cover discretionary spending. This strategy may help to amass necessary resources to cover the liquidity gap and finance profitable investment projects (or at least avoid cutting back on investment expenses and R&D). This strategy, however, has important drawbacks. Chasing receivables impairs customer relationships, while failure to pay suppliers in time may negatively influence suppliers' business. Similarly, the breach of purchase contracts and refusal to reorder inventory may jeopardize counterparty relationships. Depletion of cash reserves may be negatively perceived by the market, as the company faces the probability of a severe liquidity shortage, with solvency risks being particularly high during financial crises. Implementation of a more conservative strategy stressing the importance of long-term business relations may help to secure future business, enhance trust and maintain liquidity (by accumulating cash instead of spending it; e.g., to smooth investment). This strategy may, however, severely damage profitability. We attempt to determine which strategy yields the best payoff. Figure 1 summarizes the presented strategies of working capital management.

H2: During an economic downturn, an aggressive working capital management strategy increases a firm's profitability.

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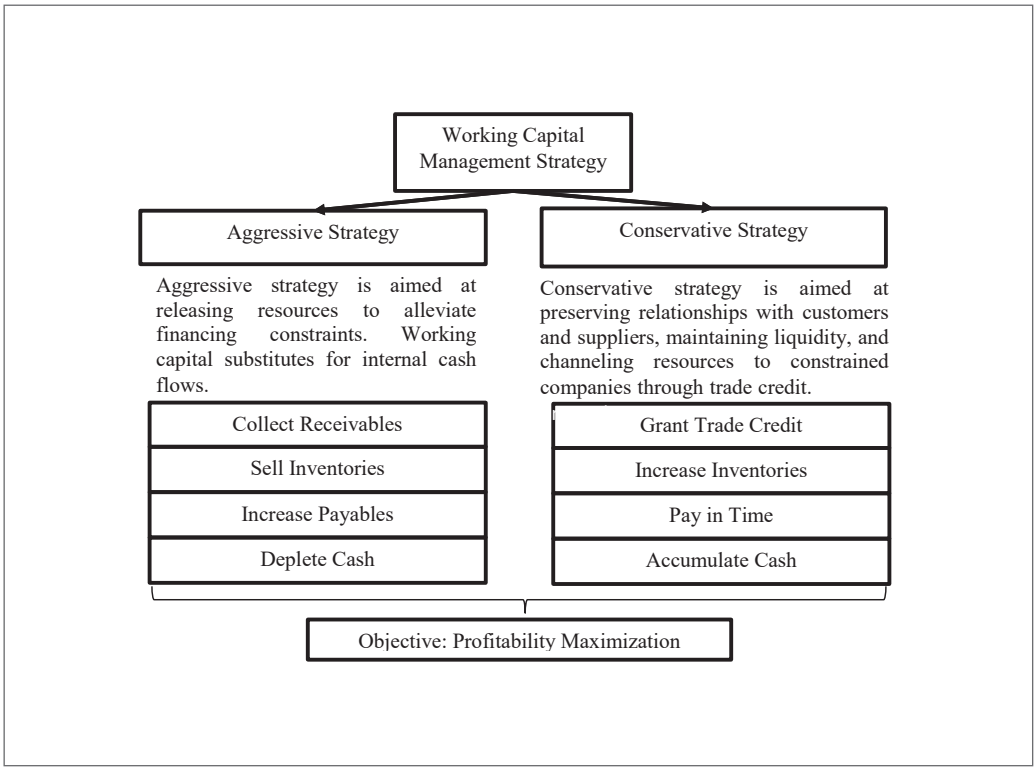

Figure 1. Working Capital Management Strategies During Economic Crises

H2 will be tested for each element of working capital investment separately, i.e., for investment in accounts receivable (H2.1), trade payables (H2.2), inventories (H2.3) and cash reserves (H2.4).

4. Data and Methodology

The sample comprises 719 Polish companies quoted on the Warsaw Stock Exchange, New Connect and OTC market. The resulting unbalanced panel dataset includes yearly firm-level data for the period 1997-2014 retrieved from the Notoria database. Financial companies were excluded from the sample, while those which no longer exist were left in order to account for survivorship bias.

We constructed static panel regression models with random effects. All models incorporate a year dummy variable to account for common macroeconomic and period-specific effects. All nominal variables are scaled by total assets to avoid the heteroscedasticity problem.

The econometric model used to test the research hypotheses is presented by Equation 1.

$$Profitability_{it} = \\ = \beta_0 + \beta_1 WCI_{it} + \beta_2 WCI_{it} Crisis + \beta' Control_{it} + \varepsilon_{it} \qquad (1),$$

where i encodes the firm, t encodes the observation time period, $Profitability_{it}$ – dependent variable represented by return on assets (ROA), WCI_{it} – working capital investment including cash scaled by total assets, $Crisis$ – binary dummy variable which is equal to 1 for the period 2008-2010 and 0 for other periods; $WCI_{it} x Crisis$ – interaction term used to test H2, $Control_{it}$ – a set of control variables discussed below,

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ε_{it} – error term. To test H1.1, H1.2, H1.3, and H1.4, the independent variable WCI_{it} is replaced with the respective element of working capital: YoY change in receivables (*Rec*), YoY change in payables (*P*), YoY change in inventory (*Inv*) and YoY change in cash and cash equivalents holdings (*Cash*) scaled by total assets.

Control Variables

Size. A natural logarithm of firms' fixed assets (*Log Fixed Assets*) is used to control for the influence of size on profitability. Empirical evidence demonstrates clear differences in patters of working capital management between small and large companies. Larger companies may be better at managing their working capital (Moss & Stein, 1993). At the same time, they are less likely to be financially constrained and may afford higher working capital investments in order to boost sales and prevent stock-outs or liquidity problems.

Growth opportunities. We use price-to-book value (*P/BV*) as a proxy for growth opportunities (Fazzari et al., 1988). Firms having valuable real options are more likely to face financing constraints and experience a shortage of internally generated cash flow, which may translate into more aggressive working capital management. Concomitantly, growth companies are more likely to accumulate cash in anticipation of attractive investment projects or in order to reduce reliance on more expensive external financing.

Leverage ratio. In addition to potentially boosting return on equity, increased gearing may alleviate the agency problem (Jensen, 1986) and stimulate more efficient working capital management.

Investment. Capital expenditure scaled by total assets (*Capex/Assets*) controls for the influence of investment policy on profitability.

Operating cash flow. Operating cash flows scaled by total assets (*OCF/Assets*) constitute an important determinant of profitability and working capital investment (Chiou et al., 2006). Generating significant OCF allows the firm to implement a conservative working capital management strategy (Fazzari & Petersen, 1993), accumulate cash, and finance value-generating investments.

Dividend payout (*Dividend Payout Ratio*). In accordance with signaling theory (Grullon, Michaely, & Swaminathan, 2002), dividend policy may serve as a predictor of a firm's profitability. Gradual transition from the growth phase to maturity and exhaustion of attractive investment projects pushes the company to pay out dividends.

External finance (*ExF/Assets*). The variable is calculated as a ratio of additional debt incurred to total assets. Braun and Larrain (2005) report that industries which predominantly rely on external financing experience more hardships during economic downturns, with the effect being particularly pronounced during a credit crunch. External finance may also be used to accommodate a conservative working capital management strategy.

Sales and sales growth. Revenue scaled by assets (*Sales/Assets*) is included as an alternative proxy for availability of internal financing. Sales growth (*Sales Growth*) may serve as a proxy for revenue volatility, which, aside from being a determinant of profitability, may also influence working capital management strategy. Being unable to accurately predict future sales, companies may choose to hold additional inventories (Hill, Kelly, & Highfield, 2010). Management may also decide to collect receivables faster or extend payables days in order to accommodate negative sales fluctuations.

5. Empirical Results

Tables 1 to 5 present the results of testing of the research hypotheses. The tested econometric models have satisfactory econometric properties and allow us to derive valid conclusions. The explanatory variables are jointly statistically significant at the conventional levels. Individual regressors preserve statistical significance after introducing additional control variables. The model specification was checked for possible collinearity issues using variance inflation factors diagnostics.

The results presented in Table 1 positively verify H1. We conclude that increased investment in working capital deteriorates a company's profitability measured

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Table 1. Results of H1 and H2 Tests

	Regressand: Return on Assets							
Model No	**1**		**2**		**3**		**4**	
no. of observations	4519		4519		4519		4470	
Wald (joint)	1199	***	1205	***	1218	***	1206	***
R^2	0,2248298		0,2256386		0,2273674		0,2289685	
AR(1) test	-2,359	**	-2,385	**	-2,4	**	-2,003	**
AR(2) test	-6,346	***	-6,412	***	-6,452	***	-5,837	***
Constant	-0,0416137		-0,0408299		-0,0743248	*	0,0256946	
	(0.044)		(0.044)		(0.044)		(0.043)	
WCI/Assets	-0,214	***	-0,215	***	-0,221	***	-0,215	***
	(0.021)		(0.021)		(0.021)		(0.021)	
WCIxCrisis	0,129808	***	0,136997	***	0,138785	***	0,137133	***
	(0.040)		(0.040)		(0.040)		(0.039)	
Log Fixed Assets	0,0274494	***	0,0273511	***	0,0290573	***	0,0207579	***
	(0.004)		(0.004)		(0.004)		(0.004)	
P/BV	-0,003	***	-0,003	***	-0,003	***	-0,003	***
	(0.001)		(0.001)		(0.001)		(0.001)	
Leverage Ratio	-0,472982	***	-0,473578	***	-0,473643	***	-0,467534	***
	(0.016)		(0.016)		(0.016)		(0.015)	
Capex/Assets	-0,0456002		-0,0083		-0,0409433		-0,037519	
	(0.037)		(0.041)		(0.039)		(0.037)	
OCF/Assets	-0,038	*	-0,058	**				
	(0.021)		(0.023)					
Dividend Payout Ratio	-2,13918E-05		-2,15312E-05		-0,000021856		-1,99934E-05	
	(000)		(000)		(000)		(000)	
ExF/Assets			-0,0787002	**	-0,0427056		-0,0441457	
			(0.036)		(0.033)		(0.032)	
Sales/Assets					0,0133138	***		
					(0.003)			
Sales Growth							1,10647E-05	
							(000)	

Notes: All models include the time dummies (not reported). This table presents the static panel model estimates. The heteroscedasticity robust standard errors are provided in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 2. Results of H1.1 and H2.1 Tests

	Regressand: Return on Assets							
Model No	**1**		**2**		**3**		**4**	
no. of observations	4233		4225		4254		4118	
Wald (joint)	615,4	***	622,7	***	668,1	***	644,4	***
R^2	0,164772		0,1661608		0,1730705		0,176903	
AR(1) test	6	***	5,906	***	6,035	***	6,861	***
AR(2) test	-2,964	***	-3,039	***	-3,094	***	-3,848	***
Constant	0,101114	***	0,102532	***	0,0781989	***	0,156908	***
	(0.022)		(0.022)		(0.023)		(0.023)	
Rec/Assets	-0,284	***	-0,283	***	-0,290	***	-0,251	***
	(0.025)		(0.025)		(0.025)		(0.025)	
RecxCrisis	-0,159514	**	-0,160905	**	-0,163396	**	-0,185399	***
	(0.073)		(0.073)		(0.072)		(0.071)	
Log Fixed Assets	0,0043718	**	0,00426371	**	0,00593107	***	3,3376E-05	
	(0.002)		(0.002)		(0.002)		(0.002)	
P/BV	-0,001	**	-0,001	**	-0,001	**	-0,001	***
	(000)		(000)		(000)		(000)	
Leverage Ratio	-0,271937	***	-0,271909	***	-0,276187	***	-0,26436	***
	(0.013)		(0.013)		(0.013)		(0.013)	
Capex/Assets	0,00036825		0,0282329		0,0251842		0,0140458	
	(0.027)		(0.029)		(0.028)		(0.027)	
OCF/Assets	0,015		-0,004					
	(0.019)		(0.020)					
Dividend Payout Ratio	-7,0481E-06		-7,3662E-06		-7,2273E-06		-9,551E-06	
	(000)		(000)		(000)		(000)	
ExF/Assets			-0,0954612	***	-0,0909394	***	-0,0673977	**
			(0.033)		(0.031)		(0.030)	
Sales/Assets					0,00906905	***		
					(0.002)			
Sales Growth							0,0199422	***
							(0.004)	

Notes: All models include the time dummies (not reported). This table presents the static panel model estimates. The heteroscedasticity robust standard errors are provided in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 3. Results of H1.2 and H2.2 Tests

	Regressand: Return on Assets							
Model No	**1**		**2**		**3**		**4**	
no. of observations	4152		4144		4174		4053	
Wald (joint)	390,7	***	398,8	***	429,5	***	485,3	***
R^2	0,1269279		0,1285512		0,1339776		0,1500387	
AR(1) test	6,17	***	6,096	***	6,022	***	7,254	***
AR(2) test	-2,617	***	-2,659	***	-2,639	***	-3,168	***
Constant	0,12249	***	0,124394	***	0,104875	***	0,15575	***
	(0.022)		(0.022)		(0.022)		(0.022)	
P/Assets	0,126	***	0,125	***	0,122	***	0,087	***
	(0.034)		(0.034)		(0.034)		(0.033)	
PxCrisis	-0,186037	***	-0,183346	***	-0,177578	***	-0,1527	**
	(0.069)		(0.069)		(0.069)		(0.066)	
Log Fixed Assets	0,00129618		0,001168		0,00242605		-0,00132526	
	(0.002)		(0.002)		(0.002)		(0.002)	
P/BV	-0,001	***	-0,001	***	-0,001	***	-0,002	***
	(000)		(000)		(000)		(000)	
Leverage Ratio	-0,266182	***	-0,266184	***	-0,270418	***	-0,266018	***
	(0.014)		(0.014)		(0.014)		(0.014)	
Capex/Assets	-0,00727065		0,0201015		0,0174573		0,0136623	
	(0.027)		(0.029)		(0.028)		(0.027)	
OCF/Assets	0,013		-0,005					
	(0.019)		(0.020)					
Dividend Payout Ratio	-7,8974E-06		-8,1848E-06		-7,8493E-06		-1,0698E-05	
	(000)		(000)		(000)		(000)	
ExF/Assets			-0,0941861	***	-0,0861712	***	-0,0641513	**
			(0.032)		(0.030)		(0.029)	
Sales/Assets					0,00835911	***		
					(0.002)			
Sales Growth							0,0287324	***
							(0.004)	

Notes: All models include the time dummies (not reported). This table presents the static panel model estimates. The heteroscedasticity robust standard errors are provided in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 4. Results of H1.3 and H2.3 Tests

	Regressand: Return on Assets							
Model No	**1**		**2**		**3**		**4**	
no. of observations	4319		4311		4341		4199	
Wald (joint)	573,7	***	581,8	***	623	***	641,9	***
R^2	0,1559928		0,1575083		0,1637621		0,1745289	
AR(1) test	5,794	***	5,663	***	5,696	***	6,306	***
AR(2) test	-2,337	**	-2,373	**	-2,445	**	-2,822	***
Constant	0,116471	***	0,118595	***	0,0941973	***	0,165085	***
	(0.022)		(0.022)		(0.022)		(0.022)	
Inv/Assets	-0,402	***	-0,402	***	-0,412	***	-0,369	***
	(0.038)		(0.038)		(0.038)		(0.037)	
InvxCrisis	0,425574	***	0,426001	***	0,427504	***	0,360209	***
	(0.065)		(0.065)		(0.065)		(0.064)	
Log Fixed Assets	0,0022711		0,00212768		0,00372943	*	-0,00166973	
	(0.002)		(0.002)		(0.002)		(0.002)	
P/BV	-0,001	**	-0,001	**	-0,001	**	-0,001	***
	(000)		(000)		(000)		(000)	
Leverage Ratio	-0,274119	***	-0,273966	***	-0,27791	***	-0,266423	***
	(0.013)		(0.013)		(0.013)		(0.013)	
Capex/Assets	-0,00165517		0,0258291		0,0210413		0,0127204	
	(0.028)		(0.030)		(0.028)		(0.027)	
OCF/Assets	0,007		-0,011					
	(0.020)		(0.021)					
Dividend Payout Ratio	-9,7852E-06		-1,0068E-05		-9,8037E-06		-1,1563E-05	
	(000)		(000)		(000)		(000)	
ExF/Assets			-0,0942663	***	-0,0859152	***	-0,0654962	**
			(0.033)		(0.031)		(0.030)	
Sales/Assets					0,00946038	***		
					(0.002)			
Sales Growth							0,027015	***
							(0.004)	

Notes: All models include the time dummies (not reported). This table presents the static panel model estimates. The heteroscedasticity robust standard errors are provided in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 5. Results of H1.4 and H2.4 Tests

	Regressand: Return on Assets							
Model No	**1**		**2**		**3**		**4**	
no. of observations	4182		4174		4204		4082	
Wald (joint)	486,5	***	491,7	***	519,9	***	544,4	***
R^2	0,1444091		0,1454266		0,1497415		0,1604576	
AR(1) test	5,766	***	5,652	***	5,851	***	7,514	***
AR(2) test	-1,78	*	-1,765	*	-1,821	*	-3,323	***
Constant	0,0926877	***	0,0942514	***	0,0740542	***	0,134438	***
	(0.024)		(0.024)		(0.024)		(0.024)	
Cash/Assets	0,105	***	0,107	***	0,101	***	0,110	***
	(0.036)		(0.036)		(0.036)		(0.035)	
CashxCrisis	0,14614	**	0,144391	**	0,152597	**	0,0903746	
	(0.068)		(0.068)		(0.068)		(0.066)	
Log Fixed Assets	0,00269016		0,0025964		0,00388856	**	-0,00051788	
	(0.002)		(0.002)		(0.002)		(0.002)	
P/BV	-0,001	**	-0,001	**	-0,001	**	-0,001	***
	(000)		(000)		(000)		(000)	
Leverage Ratio	-0,274214	***	-0,274061	***	-0,276438	***	-0,262868	***
	(0.014)		(0.014)		(0.014)		(0.013)	
Capex/Assets	-0,00185726		0,0221766		0,0157842		0,0085085	
	(0.028)		(0.030)		(0.029)		(0.028)	
OCF/Assets	-0,001		-0,016					
	(0.020)		(0.021)					
Dividend Payout Ratio	-1,1613E-05		-1,1907E-05		-1,1288E-05		-1,2386E-05	
	(000)		(000)		(000)		(000)	
ExF/Assets			-0,0807768	**	-0,0677732	**	-0,0571014	*
			(0.033)		(0.031)		(0.030)	
Sales/Assets					0,00733934	***		
					(0.002)			
Sales Growth							0,0300307	***
							(0.004)	

Notes: All models include the time dummies (not reported). This table presents the static panel model estimates. The heteroscedasticity robust standard errors are provided in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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by ROA. Larger companies are found to perform better, while those having more immediate growth opportunities appear to underperform in terms of profitability ratios. In line with expectations, companies with higher sales have better KPIs, and those relying more on external financing may have a lower ROA. The cost effect of increased working capital investment generally outweighs the benefits of procuring long-term business relationships through granting trade credit, investing heavily in inventory and paying suppliers on short notice. This implies that companies may boost their profitability by reducing cash conversion cycles. As seen in Tables 2 to 4, the same inference holds for particular elements of working capital. Hence, H1.1, H1.2, and H1.3 cannot be rejected. Profitability is inversely related to investment in receivables and inventory, and positively related to outstanding accounts payable. Interestingly, the amount of funds held in cash and cash equivalents is positively correlated with profitability, which rejects H1.4. This may suggest that the cost effect of cash holding may be overridden by precautionary motives. Additionally, profitable high-growth companies which tend to rely on internal funds for financing investment expenditure may accumulate cash in anticipation of value-generating projects. Hence, financing constraints may be the defining determinant of increased cash holdings.

The results look different for the crisis settings. The 2008 turmoil, which began in the financial markets and gradually spread to the real economy, engendered a major negative demand shock for the corporate sector. Firms had to cope with several challenges: slump in aggregate demand (caused by plummeting private consumption, investment spending, and public expenditure), overindebtedness of the corporate sector entailing the need to delay investment projects, and a credit crunch caused by a conservative monetary policy and prevailing uncertainty. Limited access to external financing, amplified by decreasing sales revenues, was an immediate repercussion of the implemented economic policy. Under growing financing constraints, firms may have altered their working capital management strategies.

Table 1 present the results of H2 testing. During the crisis, increased working capital investment was positively correlated with profitability. Thus, we reject H2. This may indicate that the cost effect lost its role as a key determinant of working capital investment, giving priority to financing constraints. Tables 2 to 5 further expand the argumentation by analyzing each element of working capital. The coefficients for the interaction term *ReceivablesxCrisis* are persistently negative and statistically significant, suggesting that chasing receivables may improve corporate performance under economic distress. Hence, we fail to reject H2.1. Negative coefficients at payables may suggest that an attempt to fill the liquidity gap by delaying payments to suppliers may jeopardize customer relationships and worsen the company's financial performance. It may also point to the simple fact that more profitable companies tend to be less reliant on trade credit during a financial crisis. Underperforming companies have to delay payments to suppliers and negotiate extensions of trade credits in order to make up for incurred operating losses. For inventory investments, decision-making also appears to be altered by the crisis settings. More profitable companies may afford a more conservative inventory management policy. They may do so in anticipation of future sales growth or in order to maintain stable relationships with suppliers. Under the latter assumption, the theory supporting the redistributive function of trade finance under conditions of financing constraints may be substantiated. Less constrained companies use trade relationships to channel financial resources to the more vulnerable firms. Limited access to capital markets reverts the criteria of optimal inventory management by shifting the accent from cost considerations to interfirm relations. Less profitable companies which endure severe cash shortages are forced to drastically reduce their working capital investment in order to release resources and cover the internal liquidity gap. This conclusion corroborates findings by Gertler and Gilchrist (1994).

Table 5 shows that firms which hold higher cash reserves during a crisis tend to perform better in terms of profitability ratios. Again, the precautionary motive and anticipation of attractive investment projects may explain the preference for cash. This relationship may also constitute an argument for the presence of financing constraints.

6. Concluding Remarks

The paper proves that financial crisis settings considerably change working capital decisions. Generally, it

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has been shown that firms may enhance their profitability by optimizing their cash operating cycle, i.e., by improving receivables collection, improving procedures for collecting bad debts, decreasing inventory investments and extensively using trade credit from suppliers. These findings highlight the importance of working capital management as a potential source of efficiency improvement and persistent competitive advantage. There may be a need to elaborate new planning techniques in order to improve working capital management practices.

Under conditions of increased capital constraints, the guidance into the process of working capital management may need additional clarification. More profitable companies appear to implement a more conservative working capital management strategy. It may be an argument in favor of the redistributive function of trade finance during crises. Financially constrained companies may be urged to cut their working capital investment in order to accommodate a reduction in internal cash flows. This paper underlines the importance of working capital management through the business cycle and accentuates the need to make careful projections in anticipation of business fluctuations.

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