

# Working Capital Management and Profitability: Empirical Evidence

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## Abstract:

This paper analyzes the impact of working capital management policies on manufacturing SMEs in the Czech Republic. The data necessary for the research was collected through a questionnaire. The sample was chosen probabilistically. We have introduced an economic discriminant to select the most significant companies within the reference population. Overall, the analysis considered 105 manufacturing companies for five years, from 2014 to 2018. The individual determinants of working capital were used as independent variables, while leverage represented the control variable. EBITDA represented the dependent variable and was used to measure profitability. To perform the analysis, we used a quantitative methodology based on dynamic panel data. The robustness analysis confirmed the validity of the results obtained. Empirical results suggest that granting longer extensions to customers does not impact profitability. Furthermore, the results of the other variables showed a negative relationship with the profitability of the companies, suggesting that investing in inventories and obtaining extensions from suppliers lead to additional costs that negatively affect profitability.

**Keywords:** Working Capital Management, Profitability, Cash, Leverage, SMEs

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## 1. INTRODUCTION

Corporate finance literature has long recognized the relevance of short-term financial decisions to a company's profitability and survival (Smith, 1980; Khoury et al., 1999; Deloof 2003; Filbeck and Krueger, 2005; Chen and Sensini, 2014; Aktas et al., 2015).

These decisions that affect working capital and significantly affect the company's liquidity are fundamental, especially in economic periods characterized by strong instability (Chen et al., 2020; Mannetta et al., 2014; Chalmers et al., 2014; Diaz and Sensini, 2020; Hernandez et al., 2021; Chalmers et al., 2018).

In the context briefly outlined, companies must focus their attention on working capital to promote their financial performance (Mannetta and Zhang, 2014; Sharma and Kumar, 2011; Campos et al., 2014).

In this regard, the empirical research investigating the relationship between working capital and performance is somewhat controversial (Tauringana and Afrifa, 2013; Sensini, 2020; Ukaegbu, 2014). Some scholars have suggested that investments in working capital have a positive impact on the profitability of the firm as they lead to an increase in sales and profits (Baños-Caballero et al. 2020; Aktas et al. 2015). With this in mind, the granting of trade credit favours increased sales and improves relations with customers. Furthermore, holding a higher inventory level protects the firm from fluctuating purchase prices of inputs to the production process. Lastly, the extensions granted by suppliers make it possible to obtain loans at implicit interest rates lower than those of banks (Mueller and Novak, 2014; Campos et al., 2014; Alvarez et al., 2021).

However, these advantages must be adequately weighted from the point of view of the balance of the specific company and the sector in which the same company carries out its economic activity (Sanchez and Sensini, 2013; Diaz et al., 2019; Shan et al., 2019). In fact, excessive investment in working capital requires additional financial resources and, therefore, can lead to additional costs that can deteriorate the company's economy. (Chang 2018; Aktas et al. 2015; Sensini, 2003; Chalmers et al., 2020). Consequently, excessive investment in working capital can lead to a reduction in profitability.

Over the past decade, some studies have suggested a non-linear relationship between working capital investment and profitability (Aktas et al., 2015; Tsuruta, 2018; Baños-Caballero et al. 2014 Sensini and Vazquez, 2021). According to these studies, investments in working capital determine a positive impact on the company's profitability up to a certain limit, defined as the optimal level of working capital. Above the optimal level, the investment in working capital has negative effects on the performance of the firm.

In the context briefly outlined, this research analyzes the relationship between working capital and profitability of a sample of manufacturing SMEs from the Czech Republic.

We have investigated this issue with reference to SMEs, as these companies have financial constraints that make them more vulnerable than large companies (Chalmers et al., 2020; Sensini, 2020).

The reasons for this study are different. The first motivation behind the study is represented by the characteristics of the market, characterized by dynamic development. Furthermore, most of the studies on this topic focus on highly developed or mature economies, while studies on the analyzed economy are quite rare. In this perspective, therefore, this study enriches the literature on the subject, providing further empirical evidence. Furthermore, empirical findings highlight that proactive working capital management policies favour profit. This circumstance has interesting practical implications, providing useful information for company managers.

The analysis was conducted on 105 SMEs using a panel methodology. The results suggest a linear relationship between the working capital and the firm's profitability.

The rest of this paper is organized as follows. Section 2 analyzes the reference literature on the relationship between working capital management and firm profitability, while the next section describes the sample used in the empirical analysis and the applied methods.

Section 4 presents the empirical results and robustness checks. Finally, the last section contains the concluding remarks.

## 2. LITERATURE REVIEW

The literature on the relationship between working capital and company performance has had a growing development over the last few decades. This growing interest was determined by the influence of the management of working capital on the company's profitability, development, and survival (Chen et al., 2014; Sensini, 2015). The effective and efficient management of working capital necessarily passes through the analysis of its determinants, namely liquidity, credits, stocks and debts (Brennan et al., 1988; Sanchez and Sensini, 2017; Mannetta et al., 2013).

The management of working capital should allow the company to generate the liquidity necessary to meet short-term debts, optimizing the relationship between risk and profitability (Filbeck and Krueger, 2005; Sensini, 2017; Boisjoly et al. 2020; Mannetta, 2014; Bello and Sensini, 2020; Chalmers et al., 2020).

Credit grants can increase sales and expand the number of customers. However, these concessions increase the level of risk, as customers could encounter financial difficulties and consequently reduce the financial flows for the company (Sensini, 2016; Diaz and Vazquez, 2019; Campos et al., 2019).

Inventory management also represents the link between production and sale (Cohen et al., 2013; Alvarez et al., 2014; Campos et al., 2015; Sensini, 2020; Chen et al., 2021), determining a strong impact on liquidity and sale. Finally, debts represent a further significant determinant of working capital (Mannetta and Zhang, 2014; Mueller and Sensini, 2021; Shin and Soenen, 1998; Chen et al., 2019).

The extension of the maturity of the debts can favour the indebtedness at lower prices than those charged by the banks. At the same time, this policy can lead to the loss of discounts or a deterioration in the relationship with suppliers (Campos et al., 2015; Parisi et al., 2014; Della Porta et al., 2018).

The relationship between the determinants of working capital and profitability is therefore controversial (Nobanee et al., 2011; Petersen and Rajan, 1997). The corporate literature that has dealt with the relationship between working capital and profitability has used different views to explain this relationship.

Some studies have found a positive relationship between working capital and profitability (Enqvist et al., 2014; Mannetta, 2014; Goncalves et al., 2018; Lyngstadaas, 2020; Moussa, 2018).

Conversely, other studies found a negative relationship between working capital and profitability (Ren et al. 2019; Dalci et al. 2019; Akgun and Karatas 2020; Pham et al. 2020; Wang et al. 2002; Ukaegbu 2014). These studies have shown that greater investments in working capital involve greater financing and, therefore, involve increasing interest costs, increasing the risk of financial difficulties (Sensini, 2016; Michalski, 2014).

Over the past few years, the literature has introduced a new view on the relationship between working capital and profitability, suggesting a concave relationship (Baños Caballero et al. 2014; Tsuruta, 2018; Aktas et al. 2015; Mannetta et al., 2014). In this perspective, these studies have shown that there is an inverted U-shaped relationship between WCM and corporate profitability. This circumstance, therefore, determines a positive relationship until the working capital has reached its optimal level. Once this optimal level is reached, the relationship becomes negative. This optimal level also depends on financial constraints. In fact, in small and medium-sized enterprises, where financial constraints are greater, the optimal level is reached at a lower level.

As is evident, the literature is somewhat controversial concerning the relationship between working capital and firm performance. This divergence may also depend on the different measures used to determine working capital (Dalci et al., 2019; Ukaegbu 2014; Baños-Caballero et al. 2014).

Multiple factors determine the company's profitability and working capital.

The literature has suggested several indicators to measure the relationship between performance and working capital: return on assets (ROA), return on equity (ROE), earnings before interest and taxes (EBIT), earnings before interest, taxes and depreciation. (EBITDA). Besides, several studies have suggested several indicators to measure the efficiency of working capital management: the Cash Conversion Cycle (CCC), the Net Trade Cycle (NTC), etc.

In line with the main literature, this study uses the variables Accounts Receivable (AR), Accounts Payable (AP), Inventories (I) and Cash Conversion Cycle (CCC) to assess the impact of these elements on working capital and profitability.

### 3. RESEARCH METHODOLOGY

The data was collected through a questionnaire that made it possible to collect all the financial information necessary for our analysis. The sample was chosen in a probabilistic manner and consisted of manufacturing SMEs headquartered in the Czech Republic. Furthermore, we have introduced an economic discriminant (total assets, turnover, number of employees, etc.) to select companies that are adequately representative of the reference population. This approach allowed to improve the efficiency of the estimates and the significance of the research results (Amendola et al., 2020).

Overall, the analysis considered 105 manufacturing companies. The observation time horizon is five years and runs from 2014 to 2018.

This study assumes that the individual determinants of working capital (DSO, DSI, DPO and CCC) represent the independent variables. Furthermore, in line with what the literature suggests, we used leverage as a control variable (Padachi, 2006; Shin & Soenen, 1998; Sensini and Vazquez, 2021).

The company's profitability was measured by EBITDA and represented the dependent variable (Parisi et al., 2014).

Table 1 summarizes all the variables used and the methodology followed for their calculation.

**Table 1- Variables of interest**

	<b>Variables</b>	<b>Calculation Methods</b>
Dependent	Firm Profitability (P)	EBITDA/Total Assets
Independent	Days Sales Outstanding (DSO)	(Accounts Receivable/Sales) * 365
	Days Sales Inventory (DSI)	(1/Stock Turnover) * 365
	Days Payable Outstanding (DPO)	Accounts Payable/Cost of Goods
Control	Leverage (LEV)	Total Debts/Total Assets

For our analysis, we used the dynamic panel data methodology as this approach favours the control of unobservable effects capable of influencing profitability and endogeneity. In this perspective, we used the regression model specified below:

$$P_{it} = \beta_0 + \beta_1 P_{it} + \beta_2 X_{it} + \beta_3 X_{it}^2 + \beta_4 LEV_{it} + \beta_5 LEV_{it}^2 + \alpha_{it} + \lambda_t + \varepsilon_{it} \tag{1}$$

Xit highlights the independent variables relating to working capital management, and αi indicates the unobservable heterogeneity. The λt indicator represents the uncontrollable variable that can influence the profitability of companies, while εit is the random disturbance.

Finally, we inserted the quadratic relationship to test the inverted U-shaped relationship.

### 4. EMPIRICAL RESULTS

To evaluate the impact of each element of working capital on profitability, we used the GMM estimator (Arellano & Bond, 2001), building four different models. Potential biases in the models were evaluated using Hansen's J statistic and the AR index (Arellano and Bond, 1991).

**Table 2 - GMM estimations**

	Model A				Model B	
	H1	H2	H3	H4	H2c	H4b
P	0.127 (0.12)	0.06 (0.11)	0.142 (0.13)	0.059 (0.13)	0.069 (0.12)	(0.083) (0.11)
DSO	-0.019 (0.02)					
DSI		-0.049** (0.02)				
DSI2					-0.067^ (0.01)	
DPO			-0.033^ (0.01)			
CCC				-0.023^ (0.02)		
CCC2						-0.006 (0.01)
LEV	-0.067^ (0.01)	-0.087* (0.03)	-0.048 (0.06)	-0.075 (0.04)	-0.056 (0.05)	-0.061 (0.05)
LEV2	0.023 (0.02)	0.015 (0.01)	0.019 (0.02)	0.021 (0.01)	0.012 (0.02)	0.016 (0.01)
F test	1.14	48.39***	41.39***	1.61**	1.69**	43.27***
Hansen J	129.31	123.2	134.57*	112.4	133.4	115.26
AR 1 test	-2.31**	-2.19**	-2.28**	-2.32**	-2.29**	-2.31**
AR 2 test	0.74	0.85	0.86	0.78	0.76	0.73

\*\*\*, \*\*, \*, and ^ denote a p value of .001, .01, .05, and .1, respectively.

The results highlight the following. Credit policy (DSO) does not affect the profitability of companies. Inventory management policy suggests a negative relationship with profitability.

Obtaining deferrals from suppliers (DPO) has a negative relationship with profitability. The Cash Conversion Cycle shows a negative relationship with profitability, confirming hypothesis 4a.

Finally, in some cases, leverage is negatively correlated with the profitability of the company.

To evaluate the reliability and robustness of the results, we used fixed effects and random effect estimators using the Hausman test (1978).

The test results, as evidenced by Table 3, suggest that fixed effects estimators are better.

**Table 3- Robustness Check**

	Model A				Model B	
	H1	H2	H3	H4	H2c	H4b
DSO	-0.017** (0.01)					
DSI		-0.033** (0.02)				
DSI2					-0.070*** (0.01)	
DPO			-0.018** (0.01)			
CCC				-0.023*** (0.01)		
CCC2						0.005* (0.00)
LEV	-0.041^ (0.02)	-0.045* (0.02)	-0.045* (0.02)	-0.041^ (0.01)	-0.043* (0.02)	-0.061** (0.01)
LEV2	0.043*** (0.00)	0.043*** (0.00)	0.041*** (0.00)	0.042*** (0.00)	0.043*** (0.00)	0.042*** (0.00)
R2	0.061	0.067	0.071	0.073	0.073	0.071

\*\*\*, \*\*, \*, and ^ denote a p value of .001, .01, .05, and .1, respectively.

The results confirm that there is a linear relationship between the individual determinants of working capital and profitability. In some cases, the estimators seem to suggest a U-relationship between some variables. However, given the level of significance, the linear relationship seems to prevail.

## 5. CONCLUSIONS

This paper had the main objective of evaluating the impact of working capital management policies on manufacturing SMEs in the Czech Republic.

We collected the data necessary for the research using a questionnaire that made it possible to collect all the financial information necessary for our analysis. The sample was chosen probabilistically and consisted of manufacturing SMEs headquartered in the Czech Republic. This approach made it possible to improve the efficiency of the estimates and the significance of the research results. Furthermore, we have introduced an economic discriminant to select the most significant companies within the reference population. Overall, the analysis considered 105 manufacturing companies for five years, from 2014 to 2018. The individual determinants of working capital were used as independent variables, while leverage represented the control variable. EBITDA represented the dependent variable and was used to measure profitability.

To carry out the analysis, we used a quantitative methodology based on dynamic panel data. This approach has considerable advantages from a methodological perspective and allows verification of the unobservable effects that can condition the results. The robustness analysis confirmed the validity of the results obtained.

Empirical findings suggest that granting longer extensions to customers does not affect profitability. Furthermore, the results of the other variables showed a negative relationship with the profitability of the companies, suggesting that the investment in inventories and the obtaining of extensions from suppliers determine additional costs that negatively impact profitability.

This document can be relevant from several points of view. First, the results can help managers better define their working capital management policies. Furthermore, the results of this study provide further empirical evidence on the relationship between working capital and profitability, enriching the existing literature on this topic.

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