





Importance of Working Capital Management and Its Components for Firm Profitability*

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Abstract

The current situation of slower economic growth is leading to a more difficult access to funds and unpredictable payment behaviour of customers, which predetermines growing importance of working capital management. The aim of the present article is to examine the effects of working capital investment and its components (inventories, accounts receivable, accounts payable and cash) on the firm's performance in the case of non-cyclical and cyclical industries in the Czech Republic. The underlying dataset comprises corporate data of 293 firms from 2010 to 2018. The calculations reveal that both industries applied over the period a very similar conservative working capital management strategy consisting in increasing working capital investment accompanied by simultaneous development of all its components. The results also indicate dissimilarities in the importance of working capital components with respect to the firm's performance. Cash seems to be the most important component, contrary to inventories, which are insignificant jointly for both industries. Accounts receivable and accounts payable are significant only for cyclical industry firms.

Keywords: accounts payable, accounts receivable, inventory, profitability, working capital management

JEL Codes: M21, L25, O12

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1. Introduction

Firms that want to succeed not only on domestic but also European or global markets must use management tools that are particularly effective. These firms focus their management on sensitive or potentially risky issues that could reduce their competitiveness. The present paper examines the effects of working capital investment and its components (inventories, accounts receivable, accounts payable and cash) on the firm's performance in the case of non-cyclical and cyclical industries.

The authors believe that the paper is extending previous studies in CEE region (at least to the authors' best knowledge) by testing the relative importance of working capital investment, including its components, for profitability. Additionally, the underlying dataset also contains private firms, typically SMEs (not only publicly traded ones) facing rather limited resources. Therefore, the observed findings may serve as a useful tool for firm performance optimization by deciding on the proper working capital strategy. Moreover, the dataset comprising corporate data from 2010 to 2018 can reveal interesting findings about working capital management with respect to the business cycle of the national economy across different sectors.

The paper is organized as follows: Section 2 summarizes the relevant theoretical underpinnings and empirical evidence in the form of a literature review. The data adjustment and subsequent descriptive analysis with the proposed methodology are described in Section 3. The results including the robustness check are elaborated in Section 4, and Section 5 concludes the paper.

2. Theoretical Background

The highly competitive markets of the 21st century require firms to be dynamic in managing their financial processes for effective decision-making that provides the necessary liquidity to meet their obligations to suppliers, manpower, and leverage (Sanchez, 2016). Working capital management is an essential element of short-term financing and cash flow; therefore, it can be regarded as a fundamental issue in corporate financial decision-making processes. As a result, it directly influences the success of a firm reflected in its competitiveness. It ensures that the firm has enough cash on hand to meet its short-term liabilities. Firms with a sound working capital policy effectively implement operational and financial decisions, which leads to better financial performance and subsequently to better profitability (Ledinscak et al., 2021). A firm that is highly efficient in working capital management is less exposed to liquidity risk. At the same time, such firm is less dependent on external financing. Therefore, such firms ultimately generate greater value for their shareholders (Prasad et al., 2019). Pecinova (2010) found a balance between benefits obtained by customers and the firm, which is a precondition

for firms to achieve or, more precisely, to maintain their long-term competitiveness and performance. Thus, working capital contributes to a firm's ability to serve the right customers in the right and efficient way, which is why costs and benefits (resulting from working capital components) need to be more closely linked to the customer care process and included in the customer value assessment.

Excessive working capital can lead to idle current assets and an increase in the book costs of current assets, reducing profits. On the other hand, if the amount of working capital is too low, the firm faces a liquidity risk, and it may result in bankruptcy (Venkatachalam, 2017). Similarly, Michalski (2016) argued that too low an amount of net working capital results in negative changes in the sales level of some firms and, as a result, in lower profits. It is dangerous for firms to destroy opportunities to generate cash receipts, and it is difficult to rebuild such opportunities. Financially effective decisions on working capital predict that the pre-crisis, crisis, and post-crisis phases are associated with higher amounts of working capital. Liquidity investments are hedging instruments against individual risk sensitivity, which is higher in times of crisis.

Working capital is a very frequent topic. Table 1 shows the numbers of articles that are listed in the Web of Science and Scopus databases.

Table 1: Numbers of articles on working capital by publication field

Categories	Web of Science			Scopus		
	Article	Proceeding paper	Other	Article	Proceeding paper	Other
Economics	4,483	955	7	2,284	40	582
Business, management	4,224	1,319	185	2,575	175	596

Source: own processing

The topic of working capital management has been investigated using samples of different segments of national economies (e.g., Barac and Muminovic, 2018; Yilmaz and Acar, 2019; Kaur and Singh, 2013), in the value chain (e.g., Viskari et al., 2011), using firms of a certain size (e.g., Kocmanová et al., 2014; Baker et al., 2019), or listed companies (e.g., Yusoff et al., 2018; Iqbal et al., 2018), keeping in mind the contradictory impacts of working capital policy on the two corporate objectives, namely liquidity and profitability (Masri and Abdulla, 2018).

Recent studies (e.g., Barac and Muminovic, 2018; Yusoff et al., 2018; Wasiuzzaman, 2015) have shown that changes in working capital correlate with profitability and that while

changes in accounts receivable and inventories correlate positively with profitability, changes in accounts payable have an inverse relation. The inverse correlation between liabilities and profitability is at variance with the theory that advocates the extension of payment terms as a means of managing working capital and improving liquidity. Moodley et al. (2017) found that for firms in industries that have significant investments in liabilities, there is a significant positive association between changes in payable days and shareholder return, which supports the general theory of working capital management.

In his research, Chauhan (2021) concluded that a higher allocation to working capital compared to other assets is not necessarily value-destructive. Firm values should be compared on the basis of firms' total asset utilization rather than on the basis of the intertemporal allocation to short-term versus long-term assets. Linking working capital management to current assets and liabilities would be a wrong way. Effective working capital management undoubtedly extends to strategic dimensions. These include set objectives and management segments such as supply chain redesign, treasury management and cash forecasting, changes in production processes, motivating managers based on monetary KPIs, and others. However, for this overlapping perception of working capital, especially the support of top management is necessary, and as any other change in a firm, this process is associated with a certain degree of risk (Lupták and Cyrankowski, 2009).

The study by Abuzayed (2012) indicated that more profitable firms are less motivated to manage their working capital. Furthermore, financial markets have failed to penalize managers for ineffective working capital management on developing markets. Moreover, Malm and Sah (2019) confirmed that firms with a high risk of litigation have longer accounts receivable periods, it takes them longer to convert inventories into cash, and they do not pay their suppliers quickly. Jiang et al. (2016) noticed that managers tend to take action to overvalue receivables rather than overvaluing inventories or undervaluing current liabilities in order to avoid working capital deficits. Hatane et al. (2022) examined the impact of working capital management and board diversity on profitability and the firm's value, with board diversity playing the role of a moderator in the relationship of working capital and firm performance. Their results indicated that working capital management and board diversity have no significant impact on profitability. However, they do have a significant positive impact on the firm's value, which implies that the market is attracted by effective working capital management and board diversity. Thus, managers can create value for shareholders by designing and implementing working capital well and maintaining each component of working capital at the optimal level. Muhammad et al. (2016) and Orobia et al. (2016) found that the level of education and training of financial management along with the entrepreneurial age do not play a role in determining the probability of frequent working capital management. Nevertheless, those firms that have advantage of management capable of managing

working capital down to the strategic level will gain a significant competitive advantage, which can be crucial in fighting competitors and overcoming crises or economic downturns.

Kocmanová et al. (2014) emphasized the importance of including small and medium-sized enterprises (SMEs) in the sample when studying working capital management, as SMEs are far less regulated by accounting standards and also less subject to performance management practices than large (or multinational) companies. Baker et al. (2019) argued that SMEs primarily depend on internal financing from retained earnings and external financing from credit lines to finance working capital needs. Indian SMEs consider the cash conversion cycle and net working capital to be the key metric of value when monitoring working capital (Motlicek et al., 2015). The results of the panel data analysis by Tauringana and Afrifa (2013) show that payables and receivables management is important for the profitability of SMEs. However, payables management is relatively more important than receivables management. According to their findings, inventory management and cash conversion cycle are not important for profitability of SMEs.

There is a number of items that can have a significant impact on working capital – traditionally, these are inventories, accounts receivable and accounts payable (see above). However, many authors argue that other common items should also be considered if they influence the effectivity of operational working capital. Tahir and Anuar (2016) added control variables to the analysis of working capital components and found that the growth of sales and firm size had positive association with profitability, while the financial debt ratio, gross domestic product, inflation and interest showed negative results. Talonpoika (2014) stressed the necessity of taking advance payments into account as part of working capital, Farshadfar and Monem (2019) examined the relative importance of working capital accruals and deferrals, Zimon (2020) or Yousaf et al. (2021) identified the specifics of working capital management for firms implementing quality management, Madhou et al. (2015) examined the impact of whether a firm is profitable/loss-making in the long term on the amount of working capital, and Habib and Huang (2018) showed that exports are an important component affecting working capital. In the case of export firms, the authors identified a curvilinear relation between profitability and working capital. In particular, the generalized mode of movement indicates an optimal working capital for manufacturing firms, estimated at roughly eight percent of sales, with the relation between working capital being influenced not only by the export performance itself, but also by the specific region of export destination – exports to stable economies maintain working capital, while exports to less stable economies generate less working capital.

Otola and Grabowska (2019) provided insight into the types of corporate financing strategies, i.e., aggressive, matching, and conservative strategies. The authors found that

the vast majority of audited firms apply the conservative strategy of working capital management. *“A conservative strategy of working capital management implies higher investment in working capital and high levels of liquidity, where lower risk but also lower profitability can be expected. An aggressive strategy of working capital management implies less investment in current assets, where higher profitability but also higher risk are expected. Firms with a shorter cash conversion cycle will pursue a more aggressive policy of working capital management because they can take a higher risk, while firms with a longer cash conversion cycle will pursue a more conservative policy of working capital management”*. Prsa et al. (2021) found that firms operating in post-transformation countries characterized by less developed markets and uncertain business environment apply the conservative strategy of working capital management. They further argued that industries with shorter cash conversion cycles will pursue more aggressive policies of working capital management and vice versa.

The findings of the above studies demonstrate that the components of working capital should be managed together to achieve positive effects on profitability and firms should be aware of the fact that they do not do their business in a “vacuum”; therefore, they need to take into account other companies in the value chain (Viskari et al., 2011), the industry characteristics and other external factors when managing the components of working capital. This is particularly true in the current situation of slowing economic growth, when firms are under pressure due to difficult access to funds and the subsequent deterioration of liquidity and productivity indicators.

Research dealing with working capital management using a sample of cyclical and non-cyclical industries has not been reported in the Web of Science and Scopus databases yet, but investigation of phenomena divided into cyclical and non-cyclical industries has been presented by many authors – for example, in the field of taxes (Gassen et al., 2019) and other economic phenomena (Bortoluzzi et al., 2017; Kuziak and Piontek, 2019).

Based on the previous discussion, the following hypothesis are proposed:

H1: Non-cyclical and cyclical industries tend to apply the same working capital management strategies during the respective period.

H2a: Working capital investment has the same importance from the profitability generation point of view across both non-cyclical and cyclical industries.

H2b: Different working capital investment components do not have the same importance from the firm’s profitability perspective.

3. Research Objective, Methodology and Data

3.1 Raw data

Due to the acknowledgment of working capital investment importance from (i) the firm's operational perspective (uninterrupted physical production), (ii) sufficient liquidity and solvency security, and (iii) operating performance optimization (Pais and Gama, 2015; Aktas et al., 2015), we decided to test all its components. To gain broader picture/understanding of working capital investment prominence and its magnitude across national economy, firms from non-cyclical and cyclical industries in the Czech Republic were tested (Vithessonthi and Tongurai, 2015; Talberg et al., 2008). In this study, food industry (NACE² C10) jointly with beverage production (NACE C11) were chosen as representatives of non-cyclical industries. Contrary to it, machinery and motor vehicle production (NACE C28 and C29) were proposed as representatives of cyclical industries.

To avoid any composition effect (Xu, 2012), entities that did not exist during the entire nine-year sample period, or those whose financial figures were not complete, were removed (Xu, 2012). As did Faulkender and Petersen (2006) or Nguyen et al. (2020), we observed and removed several firms with extremely high leverage (above one). No cut-off points from total assets nor age were imposed. Therefore, the underlying data sample contains both small and large firms, as well as private and publicly traded companies. After all adjustments, the final balanced dataset consists of 293 firms (including locally established branches of foreign firms) with 2,637 firm-year observations based on financial statements from 2010 to 2018.

In line with the above discussion, the following variables were selected to capture potential performance determinants. Table 2 below shows a comprehensive overview.

2 NACE stands for Nomenclature statistique des activités économiques dans la Communauté européenne (i.e., Statistical Classification of Economic Activities in the European Community).

Table 2: Variables used

Variables		Abbr.	Description
Endogenous variables	Return on assets	ROA	EBITDA scaled by total assets
	Inventory ratio	INV_TA	Inventories scaled by total assets
Firm-specific	Accounts receivable ratio	AR_TA	Accounts receivable scaled by total assets
	Accounts payable ratio	AP_TA	Accounts payable scaled by total assets
	Cash ratio	CASH_TA	Cash scaled by total assets
	Working capital investment	WI_TA	Inventory ratio + Accounts receivable ratio + Accounts payable ratio + Cash ratio – Accounts payable ratio
	Short-term leverage	STBL_TA	Working capital financing scaled by total assets
	Long-term leverage	LTBL_TA	Long term financing scaled by total assets
	Firm age	AGE	Number of years in the business (in years)
	Capital intensity	CAPEX_TA	Capital expenditures scaled by total assets
	GDP growth	GDP	Annual GDP growth (in % p.a.)
Macroeconomic specific	Inflation	CPI	Customer Price Index (in % p.a.)
	3M Pribor	3MPRIBOR	Annual 3M Pribor average rate (in % p.a.)
	Unemployment rate	UNE_R	Annual unemployment rate (in % p.a.)

Source: own processing

3.2 Descriptive analysis

Prior to the actual regression based on a quantitative analysis of selected determinants of the overall profitability, we carefully inspected our data sample for potential inconsistencies and analysed statistical properties of variables of our interest.

The minimum values of working capital components represent firms with components equal to zero in the observed period. A maximum value of the accounts payable ratio (AP_TA) higher than 1 reflects a firm with negative equity. Capital intensity (CAPEX_TA) with a nega-

tive sign corresponds to the capital expenditure (cash out) ratio. A positive value of this determinant is relatively rare (accounts only for 2.8% of the whole sample) and is primarily driven by firm splits and/or revaluation of assets. The financial/banking leverage ratios, both long-term (LTBL_TA) and short-term (STBL_TA), amounting to zero correspond to debt-free firms from the perspective of long-term and/or short-term bank loans. Financial leverage is predominantly represented by senior bank loan financing since the Czech Republic, with its underdeveloped capital markets, is a rather bank-driven economy. Thus, other forms of financing such as intragroup loans (usually subordinated to senior bank debts, and therefore evaluated by the bank as “quasi-equity”), corporate bonds, etc., represent only a minor fraction of external financing of the Czech companies in the selected sectors (the average value is calculated for 0.76% of the total balance sheet in our sample, the year-to-year average value varies between 0.5–1.4% of the entire balance sheet). Also, off-balance indebtedness (typically leasing liabilities) is omitted due to inconsistent reporting at the firm level and is offset by using EBITDA as the profitability/performance indicator.

Table 3: Descriptive statistics

Full sample	Mean	SD	Min	Median	Max	Skewness	Kurtosis
ROA	0.109	0.104	−0.729	0.094	0.872	0.760	9.777
INV_TA	0.192	0.146	0.000	0.157	0.854	1.066	1.083
AR_TA	0.207	0.147	0.000	0.183	0.886	1.112	1.646
AP_TA	0.197	0.175	0.000	0.154	1.284	2.100	6.323
CASH_TA	0.068	0.097	0.000	0.030	0.778	2.774	9.887
STBL_TA	0.107	0.118	0.000	0.075	0.984	1.329	2.509
LTBL_TA	0.104	0.138	0.000	0.052	0.989	1.970	4.833
AGE	17.290	5.922	4.000	18.000	46.000	−0.144	0.156
CAPEX_TA	0.068	0.085	−0.410	0.043	0.684	2.030	8.702
GDP	2.444	1.940	−0.800	2.400	5.400	−0.028	−0.794
CPI	1.567	0.944	0.300	1.500	3.300	0.255	−0.921
3MPRIBOR	0.781	0.563	0.290	0.500	2.010	1.027	−0.162
UNE_R	5.411	1.815	2.300	6.200	7.400	−0.553	−1.259

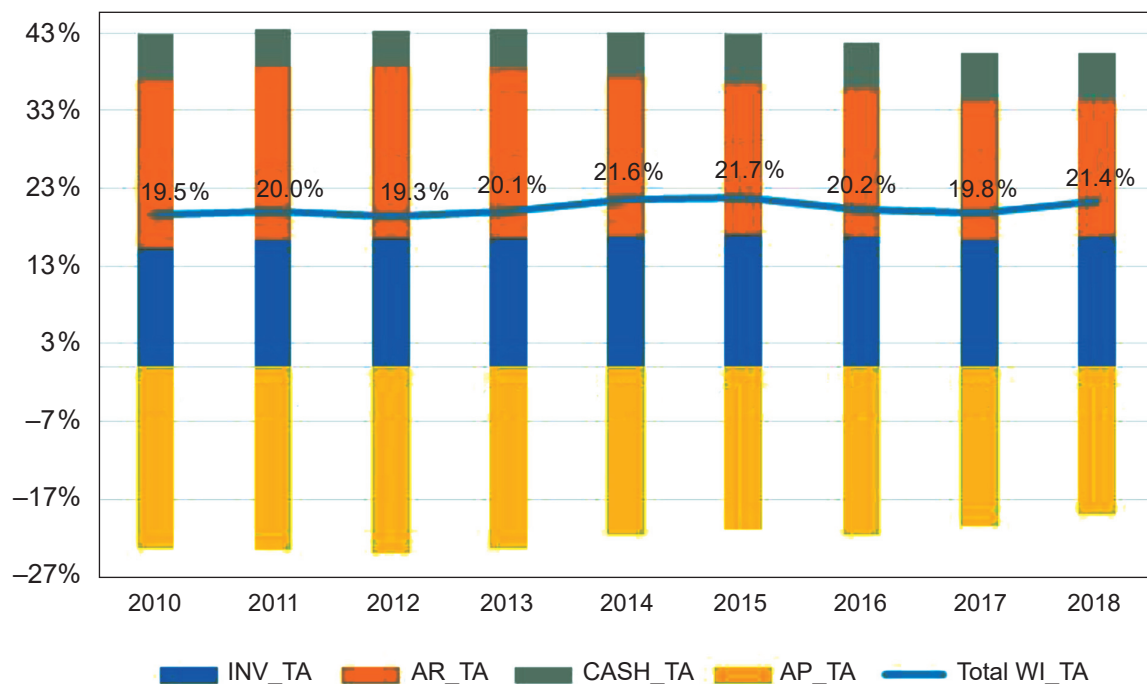
Source: own calculation

Similar to other scholars (e.g., Vithessonthi and Tongurai, 2015; Taurigana and Afrifa, 2013) the ROA ratio is used as a proxy of industry performance. In our dataset, performance of selected industries experienced similar development. Namely, cyclical industry started with an ROA value of 13.5%, facing a gradual decrease and ending with 10.5% (i.e., a 22.1% reduction over the observed period). Non-cyclical industries show overall lower performance throughout the period simultaneously characterized by relatively stable development (10.3% in 2010 versus 10% in 2018).

Further analysis of the underlying dataset surprisingly reveals the following findings. The level of average total leverage in both industries in the observed period is almost the same, equal to 21.3% for cyclical industries and 21% for non-cyclical ones. Non-cyclical industries started with higher average total indebtedness, which was eventually reduced by 7.4% (reaching 19.5% in 2018). Jointly, cyclical industries experienced similar development (smaller in its magnitude) ending with total average leverage of 20.8% (in 2018). Also interesting is the leverage decomposition from the debt maturity point of view, where the almost even distribution between average long-term debt (LTBL_TA) and average short-term debt (STBL_TA) accounts for 49.2% and 50.8% respectively jointly for both industries over the observed period. Nevertheless, there was opposite developments of short and long-term debt within each industry. In the case of non-cyclical industry, both annual average leverages faced reduction in the short term by 12.1% as well as in the long term by 2.6%. Contrary to it, the annual average short-term debt ratio in the cyclical industry increased by 19.1% and the long-term debt ratio decreased by 25.1%.

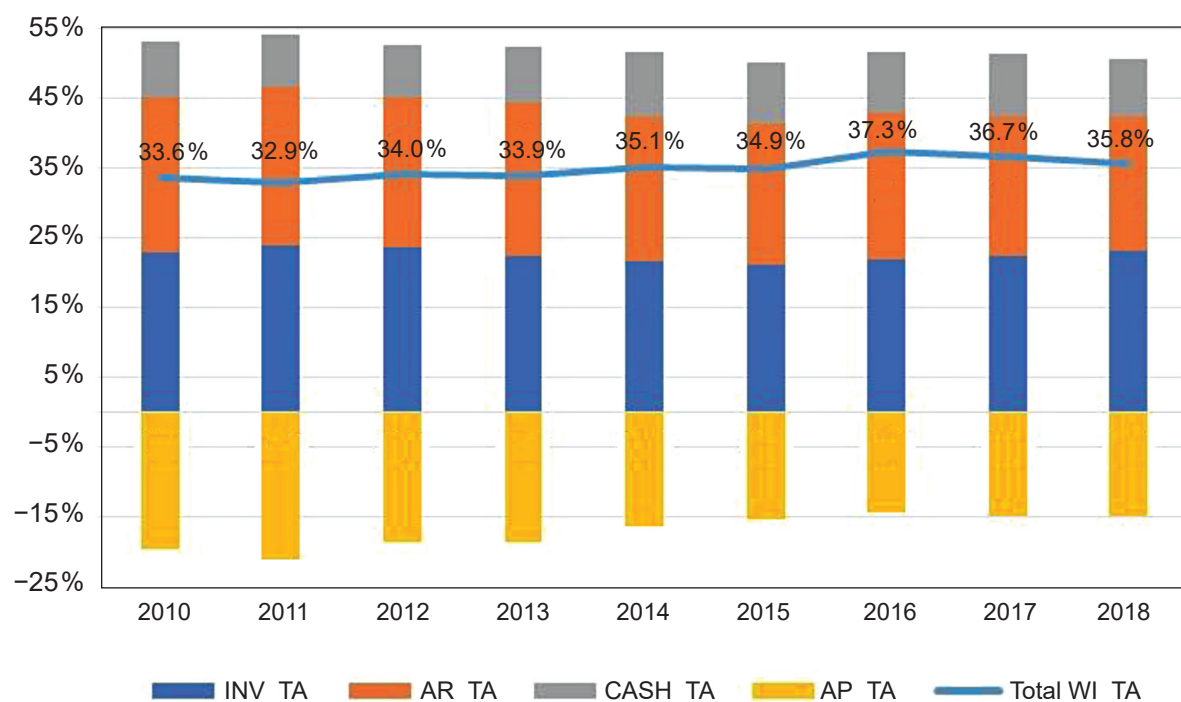
In this study, working capital investment (WI_TA) consists of the following characteristics: cash on hand (CASH_TA), inventories (INV_TA) including material and work in progress, tradable accounts receivable (AR_TA) and tradable accounts payable (AP_TA) in the relative form (scaled by total assets). Any advance payments both received and paid are omitted since they are insignificant in their magnitudes (accounting for approximately 0.5% to 1% of the total assets for non-cyclical and cyclical industries respectively).

As can be seen from Figure 1, the biggest share of working capital investment is the accounts payable share (AP_TA), where the average value over the observed period equals -21.9% (the negative sign indicating liability characteristic) followed by the accounts receivable share (AR_TA) with an average value equal to 20.3%. Only two components of working capital investment achieved reduction, namely the accounts receivable share (AR_TA) accompanied by the accounts payable share (AP_TA) at -19.3% and -18.9% respectively. Contrary to that, the remaining components inventory share (INV_TA) and cash on hand share (CASH_TA) increased by 10.5% and 2.7%, leading to increases in the working capital investment share (WI_TA) by 9.9% (19.5% in 2010 versus 21.4% in 2018).

Figure 1: Decomposition of working capital investment share for non-cyclical industries

Source: own calculation

Development of working capital investment components for selected cyclical industries can be observed in Figure 2. In this case, the inventory share (INV_TA) of 22.6% jointly with the accounts receivable share (AR_TA) of 21.6% represent the highest average shares in working capital investment. The cash on hand share (CASH_TA) accounts for the smallest part of working capital investment, but in this case the average value is higher almost by 50% (8.3% versus 5.5%) compared to non-cyclical industries. As with non-cyclical industries, a significant reduction of the average share was achieved by the accounts receivable (AR_TA) and accounts payable (AP_TA) components. The total working capital investment for cyclical industries is slightly above 30% of the total balance sheet, which is approximately 71% greater compared to non-cyclical industries (average of 34.9% versus 20.4% respectively). This means that firms in selected cyclical industries retained significantly more resources in their working capital investments (particularly in inventories). Surprisingly, it seems that both sectors applied simultaneously a rather conservative working capital management strategy over the observed period that differs in its magnitudes based on an increase in the annual average inventory (INV_TA) and cash (CASH_TA) shares and a reduction in the annual average accounts receivable (AR_TA) and accounts payable (AP_TA) shares.

Figure 2: Decomposition of working investment share for cyclical industries

Source: own calculation

Table 4: Annual average change in working capital components in % (2010–2018)

Industry/component	INV_TA	AR_TA	CASH_TA	AP_TA	WI_TA
Non-cyclical	10.49	−19.33	2.71	−18.9	9.9
Cyclical	0.18	−12.63	3.47	−23.83	6.4

Source: own calculation

An interesting question that would deserve further and deeper analysis are the main driving forces behind significant reduction in the accounts receivable (AR_TA) and accounts payable shares (AP_TA) for both cyclical and non-cyclical industries (legal intervention, more accessible external financing made available, etc.).

The share of annual capital expenditures scaled by total assets (CAPEX_TA) is used as a proxy of capital intensity. It seems that capital intensity is slightly higher in the case of non-cyclical industries (average value of 6.9% versus 6.7% for cyclical industries), also experiencing higher reduction by −7.9% (−1.9% for cyclical industries).

3.3 Methodology

We construct the following model (Model 1) for an analysis of impact of working capital components on a company's balance sheet (measured by their shares in total assets) on profitability defined as return on assets (in our case, EBITDA divided by total assets):

$$ROA_{it} = INV_TA_{it} + AR_TA_{it} + AP_TA_{it} + CASH_TA_{it} + LTBL_TA_{it} + STBL_TA_{it} + AGE_{it} + CAPEX_TA_{it} + GDP_t + CPI_t + 3MPRIBOR_t + UN_R_t + v_i + \varepsilon_{it} \quad (1)$$

where *INV_TA*, *AR_TA*, *AP_TA* and *CASH_TA* represent inventory, accounts receivable, accounts payable and cash scaled to total assets, respectively. Furthermore, we include leverage-related variables, namely long-term leverage (*LTBL_TA*, defined as long-term bank loans to total assets) and short-term leverage (*STBL_TA*, similarly defined as short-term bank loans to total assets) in order to capture different nature and purposes of bank financing on the balance sheets. We also include other firm-specific control variables such as age or CAPEX intensity measured by amount of capital expenditures scaled to total assets. Finally, we control for economy-specific variables such as GDP growth, inflation measured by the CPI index, 3-month PRIBOR rate (i.e., 12-month average of the Prague Inter Bank Offered Rate) and unemployment rate (*UN_R*). The error term consists of a company-specific term v_i and a disturbance term ε_{it} .

We also run a model replacing the individual working capital components by a single variable capturing the proportion of working capital on the balance sheet (Model 2):

$$ROA_{it} = WI_TA_{it} + LTBL_TA_{it} + STBL_TA_{it} + AGE_{it} + CAPEX_TA_{it} + GDP_t + CPI_t + 3MPRIBOR_t + UN_R_t + v_i + \varepsilon_{it} \quad (2)$$

Having a panel dataset in hand, we proceed with a standard model selection procedure. First, we test for the presence of significant individual effects using an F-test for fixed effects and a pooled ordinary least squares model. A p-value lower than 0.001 indicates rejection of the hypothesis of no significant effects.

After that, we test consistency of fixed-effect and random-effect models using the Hausman test. The zero hypothesis of both models being consistent is rejected (p-value < 0.001) meaning that the random-effect model might yield inconsistent estimates. Based on the above, we select an individual fixed-effect ordinary least squares model for our analysis. Estimated coefficients are presented together with panel-corrected standard errors by Beck & Katz (1995) as the performed Breusch-Pagan tests reject the zero hypothesis of homoskedasticity.

Finally, we inspect a potential multicollinearity using a variance inflation factor (VIF). As the maximum VIF amounts to 2.4, we find no evidence of any multicollinearity issue in the variables included in the models.

4. Results

The estimation results of Models 1 and 2 are presented in the tables below. We observe that individual components of working capital scaled to total assets do not show any significant effect on company performance measured by return on assets, with the exception of cash/total assets. On the other hand, we find significant negative effects of leverage with a more pronounced impact of short-term bank indebtedness. None of the remaining control variables turn out as significant except a small negative coefficient of company age. Turning to the cyclical businesses, we detect a significant positive effect of accounts receivable to total assets and the opposite result for accounts payable. Similarly as in the non-cyclical subsample, we find a positive effect of cash to total assets. In terms of leverage-related variables, the difference between the effects of long-term and short-term bank leverage is much more limited than in the case of the non-cyclical companies. From the remaining control variables, we find CAPEX intensity to have a modest positive effect as well as the unemployment rate.

When we analyse the impact of working capital in aggregate, we detect its effect to be significant only in the case of cyclical companies. As expected, the estimation results for the remaining variables are similar as in Model 1 with the exception of long-term leverage in the non-cyclical subsample, where the modest negative effect turns out to be insignificant in Model 2.

Table 5: Effect of working capital components on ROA

	Non-cyclical (food & beverage production)	Cyclical (machinery and motor vehicle production)
INV_TA	−0.048 (0.054)	0.051 (0.049)
AR_TA	−0.016 (0.037)	0.174 *** (0.042)
AP_TA	−0.044 (0.025)	−0.187 *** (0.034)
CASH_TA	0.235 *** (0.055)	0.338 *** (0.052)
LTBL_TA	−0.062 * (0.030)	−0.141 *** (0.037)
STBL_TA	−0.248 *** (0.035)	−0.205 *** (0.043)
AGE	−0.007 * (0.003)	0.004 (0.004)
CAPEX_TA	−0.034 (0.028)	0.092 ** (0.030)
GDP	−0.001 (0.001)	0.003 (0.002)
CPI	−0.003 (0.002)	0.000 (0.002)
3MPRIBOR	−0.006 (0.004)	0.007 (0.004)
UNE_R	−0.012 * (0.006)	0.015 * (0.006)
Adj. R2	57.9%	53.7%

*** p < 0.001; ** p < 0.01; * p < 0.05.

Source: own calculation

Table 6: Effect of total working capital investment on ROA

	Non-cyclical	Cyclical
WI_TA	0.017 (0.024)	0.138 *** (0.029)
LTBL_TA	−0.056 (0.030)	−0.143 *** (0.038)
STBL_TA	−0.260 *** (0.036)	−0.269 *** (0.045)
AGE	−0.007 * (0.004)	0.005 (0.004)
CAPEX_TA	−0.038 (0.027)	0.069 * (0.030)
GDP	0.000 (0.001)	0.003 (0.002)
CPI	−0.004 (0.002)	−0.002 (0.002)
3MPRIBOR	−0.005 (0.004)	0.005 (0.005)
UNE_R	−0.013 * (0.006)	0.015 * (0.006)
Adj. R2	56.6%	49.6%

*** p < 0.001; ** p < 0.01; * p < 0.05.

Source: own calculation

We perform multiple robustness checks with no substantial change to our findings. First, we run the models defined above using an alternative definition of return on assets being the dependent variable. The estimation results using ROA defined as EBIT/TA are provided in Table 7.

Table 7: Effects defined as EBIT/TA

	Effect of working capital components on ROA defined as EBIT/TA		Effect of total working capital investment on ROA defined as EBIT/TA	
	Non-cyclical	Cyclical	Non-cyclical	Cyclical
INV_TA	−0.033 (0.048)	0.053 (0.049)		
AR_TA	0.003 (0.034)	0.170 *** (0.043)		
AP_TA	−0.050 * (0.023)	−0.168 *** (0.034)		
CASH_TA	0.194 *** (0.050)	0.330 *** (0.052)		
WI_TA			0.056 ** (0.020)	0.188 *** (0.027)
LTBL_TA	−0.081 ** (0.028)	−0.161 *** (0.038)	−0.074 ** (0.027)	−0.148 *** (0.037)
STBL_TA	−0.257 *** (0.032)	−0.227 *** (0.043)	−0.265 *** (0.032)	−0.261 *** (0.043)
AGE	−0.006 (0.003)	0.010 (0.005)	−0.007 (0.004)	0.010 * (0.005)
CAPEX_TA	0.002 (0.026)	0.057 (0.032)	0.005 (0.026)	0.062 * (0.031)
GDP	−0.002 (0.001)	0.004 (0.002)	−0.001 (0.001)	0.005 (0.002)
CPI	−0.002 (0.002)	0.002 (0.003)	−0.003 (0.002)	0.002 (0.003)
X3MPRIBOR	−0.006 (0.004)	0.011 (0.007)	−0.006 (0.004)	0.010 (0.007)
UNE_R	−0.010 (0.006)	0.025 ** (0.009)	−0.011 (0.006)	0.025 ** (0.009)
nobs				

*** p < 0.001; ** p < 0.01; * p < 0.05.

Source: own calculation

The robustness check confirms the significance, nature and intensity of the effects of working capital or its components on company performance even if measured by an alternative indicator. Importantly, the differences detected between the cyclical and non-cyclical sectors remain valid.

Afterwards, we test the robustness including lagged profitability among independent variables in both models. Similarly to the above, the results confirm the findings summarized above (untabulated results are available upon request).

5. Conclusions

Working capital is a very frequent topic of publication by many authors in a number of segments of the national economy. This fact clearly advocates the importance of working capital in the management of a business in order to increase its performance.

The objective of this study was to inspect the relative importance of working capital management measured by working capital investment (WI_TA) and its components for profitability of non-cyclical and cyclical industries. Today, this is becoming extremely important in light of the unstable market conditions caused by the COVID-19 pandemic (supply chain disruption, lack of physical inputs, volatile prices, etc.), leading to significantly higher requirements on working capital management flexibility (reinforcement of inventory to surpass delivery delays, etc.) to ensure and preserve resilient firm performance.

Our evidence clearly showed that both types of industries (non-cyclical and cyclical) have implemented very similar working capital management strategies (differing in their magnitudes) over the respective period. More precisely, a conservative strategy was employed consisting in increasing selected working capital components (annual average inventory (INV_TA) jointly with annual average cash (CASH_TA) shares) simultaneously with a reduction to remaining working capital components (annual average accounts receivable (AR_TA) and annual average accounts payable (AP_TA) shares), leading to an increase in the overall working capital investment (WI_TA) share and thus confirming hypothesis H1.

The results of our panel regression analysis suggested that working capital investment (WI_TA) plays a different role in profit creation across non-cyclical and cyclical sectors during the selected period. In other words, working capital investment is significant only in the case of cyclical industries (for non-cyclical industries it is insignificant). Therefore, hypothesis H2a must be rejected. One possible explanation of this discrepancy in significance may lie in the magnitude (both relative and nominal) of working capital investment on the firm's total balance sheet, where firms from non-cyclical industries achieved an average share of 20.4% contrary to firms from cyclical industries with an average value of 34.9% over the respective period.

The analysis indicated that conduct of working capital components with respect to the firm's financial performance showed variance between the selected industries. In the case of non-cyclical industry working capital, components seem to play an insignificant role (with the exception of cash), contrary to cyclical industry, where all the components play significant a role (with the exception of inventories). Although the results are inconclusive as to whether accounts receivable (AR_TA) or accounts payable (AP_TA) are relatively more important, both are more important than inventories (INV_TA). This led us to the conclusion that given limited resources, firms chose to prioritize their conduct of working capital investment focusing on cash (both industries) and accounts receivable and accounts payable (for cyclical industry in addition). Based on the above finding, Hypothesis 2b can be accepted.

We believe that understanding the importance of working capital investment (including its components) for firms' performance can be potentially helpful to management at least from the following perspectives: (i) rationing on working capital component allocation (assumption of limited resources); (ii) proper working capital management strategy development and set up; and (iii) effective working capital management strategy adjustments reflecting unstable market conditions (promote sales by increasing accounts receivable, ask for greater trade credit, thus raise accounts payable, etc.), thus ensuring firms' market competitiveness and stable performance.

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