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THE IMPACT OF THE WORKING CAPITAL MANAGEMENT ON FIRM PROFITABILITY IN THE ROMANIAN MANUFACTURING INDUSTRY

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***Abstract*—**The purpose of this study is to examine the relationship between the working capital management and corporate profitability for the companies from manufacturing industry listed on the Bucharest Stock Exchange for a period of five years from 2011 to 2015. This paper reveals that there is a negative relationship between profitability, measured through return on assets, and cash conversion cycles. The negative association assumes that, when the cash conversion cycle increases, the profitability of the firm decreases. Thereby, managers can increase the profitability of their companies reasonably, by handling correctly the cash conversion cycle and by keeping its components at an optimal level.

***Keywords*—** working capital management, corporate profitability, inventory policy, trade policy

I. INTRODUCTION

IN this paper, it is investigated the relationship between the working capital management and the firms' profitability for the companies from manufacturing industry listed on the Bucharest Stock Exchange for a period of five years from 2011-2015. The management of the working capital aims to find a balance between accounts payable, inventories and accounts receivable, and therefore between liquidity and profitability in order to maximize the value of the firm. The management of the working capital is a significant part of the corporate financial management because it affects the firm's performance. Reference [1] determined that companies from Taiwan and Japan with higher values for the working capital maintain a notably lower investment than companies with lower values.

The working capital management deals with providing financial resources for a firm so as to be able to run its day-by-day activities. The financial equilibrium implies that the current assets should be financed by current resources and the noncurrent assets should be financed by noncurrent resources. The working capital is described as the difference between companies' current assets and current liabilities. The working capital should be considered an investment for a company. If a firm holds large inventory stocks, this allows avoiding discontinuances in the production process and in situations when the demand for a product cannot be fulfilled from the current inventory. If trade credit to clients is granted, then sales may be stimulated, because it represents an additional source of credit for them. However, the higher the trade credit and the inventories, the less financial resources are available to the company for profitable investments. Liquidity represents a prerequisite to guarantee that companies can meet their short-term commitments. Inadequate liquidity can lead to bankruptcy. However, too much liquidity can be unfavorable to firms' profitability [2]. Thereby, finding the optimal level of working capital may be a difficult task for the firms' managers [3].

In the literature are a lot of studies that have examined the relationship between profitability and the working capital management in different markets. In a comprehensive study [4], a strong negative relationship between the working capital efficiency and profitability for U.S. listed firms was found. More recently, reference [5] analyzed a sample of American manufacturing companies listed on the New York Stock Exchange from 2005-2007. This study shows that profitability can be improved if companies manage their working capital in a more efficient way. Reference [3] found a significant negative relationship between gross operating income and the number of days accounts payable, inventories, and accounts receivable of several large Belgian non-financial companies for a period of five years. Thus, corporate profitability may be increased by reducing the number of day's accounts inventories and receivable. Reference [6] analyzed a sample of firms listed on the Athens Stock Exchange for the period between 2001-2004 and found a statistically significant relationship between gross operating profit and the cash conversion cycle and its components. This study notes that the profitability of the firms may be increased by keeping the conversion cycle components at an optimal level. Reference [7] studied a panel of small to medium-sized enterprises from Spain between 1996 and 2002. This study reveals that value can be created for the company by reducing inventories, and the number of days for which their accounts are

outstanding. Reference [8] used the pooled ordinary least square and the fixed effects regression models in order to investigate the influence of working capital management components on firms' profitability by using a sample of firms listed on the Nairobi Stock Exchange for the period between 1993 and 2008. The study notes that there is a highly significant positive relationship between profitability and the time it takes the company to pay its creditors and at the same time there is a highly significant negative relationship between profitability and the time it takes to collect cash from their customers.

The management of working capital is especially important for the companies that have limited access to long-term capital markets. In order to finance their activities, these companies have to count on short-term bank loans, internally generated funds, and trade credits. The working capital may be used as an additional source of finance for these companies [2].

The manufacturing industry represents the vector of the production structure, and has a significant role in added value creation, taking into account its high value within GDP (Gross Domestic Product) creation. In 2013, the contribution of the Romanian manufacturing industry to GDP creation reached 26 percent [9]. Besides creating jobs, the manufacturing industry is a cornerstone of innovation in the economy, generating positive effects on the rest of the economy. The Romanian manufacturing industry provides 92% of the country's exports [10]. During the recent years, the Romanian manufacturing industry has registered continuous growth. Between 2008 and 2014, Romania ranked first in terms of the evolution of European manufacturing industry constituted by reference to 2008 [11]. No study, to the best of our knowledge, has examined the relationship between the working capital management and the firms' profitability for the companies from the Romanian manufacturing industry.

The rest of the paper is organized as follows: in the second section some background information about the working capital management and the hypotheses for the empirical testing are presented. Furthermore, the empirical results are presented in the third section and, finally, the last section summarizes the conclusions.

II. METHODOLOGY

In this study, we examined the relationship between the working capital management and the firms' profitability using a sample of seventeen companies from manufacturing industry listed on the Bucharest Stock Exchange and a study period of five years, between 2011 and 2015, resulting in eighty-five total observations. In order to compute the final proxy variables, the analysis was performed using data from the financial statements of several companies.

In this paper, in order to quantify the influence of the working capital on corporate profitability, the choice of proxy variables was based on previous reported empirical data. As a consequence, the proxy variables are the following: return on assets, cash conversion cycle, days of inventory outstanding, days sales outstanding, days payable outstanding, current ratio, debt ratio, and firm size.

Multiple variables considered as a measure of the profitability of manufacturing firms can be found in the literature. In this paper, based on the analyses developed by [1], [7], [12] the return on assets (ROA), measured as the ratio of company's annual earnings to total assets, as a proxy for company's profitability, was used. ROA shows the percentage of profit that a firm earns in relation to its total assets. The ROA focuses on measuring the society's overall profitability and, as pointed out by [13], is not obscured by special items or affected by the capital structure of the firm. The dependent variable is profitability proxied as ROA.

The cash conversion cycle (CCC), a practical and comprehensive way of measuring working capital management, has been the most used in the literature. CCC indicates the length of time, in days, between the payment of purchases to the supplier and the collection of sales of finished goods from the customers. The lower the CCC, more efficiently the company is capable of managing its working capital. The CCC is composed of the cycle times of accounts receivable, inventories and accounts payable, and is defined as follows:

$$\mathbf{CCC} = \mathbf{DIO} + \mathbf{DSO} - \mathbf{DPO} \tag{1}$$

where:
DIO – days inventory outstanding;
DSO – days sales outstanding;
DPO – days payable outstanding.

The days inventory outstanding (DIO) specifies how long it takes a firm to turn its inventory into sales. The days inventory outstanding ratio is given by (2).

$$\mathbf{DIO} = \frac{\mathbf{Inv} \cdot \mathbf{365}}{\mathbf{COGS}} \tag{2}$$

where:
Inv – inventory;
COGS – cost of goods sold.

Generally, a decreasing DIO is favorable for the company if the cash is tied up in inventory for fewer days.

The days sales outstanding ratio represents the average number of days that a firm takes to collect revenue after a sale has been made. The days sales outstanding ratio (DSO) is calculated as follows:

$$\mathbf{DSO} = \frac{\mathbf{AR} \cdot \mathbf{365}}{\mathbf{Sal}} \tag{3}$$

where:
AR – accounts receivable;
Sal – sales.

A decreasing DSO means that a firm is managing its working capital efficiently, as it takes fewer days to

collect its account receivables, which imply that it has an opportunity to put the cash to use again more quickly due to shortening of the cash cycle.

The days payables outstanding shows how long it takes a firm to pay its trade creditors, such as suppliers. The days payable outstanding (DPO) ratio is given by (4).

$$\mathbf{DPO} = \frac{\mathbf{AP} \cdot \mathbf{365}}{\mathbf{COGS}} \quad (4)$$

where:

AP – accounts payable.

In order to allow an opposite analysis of the working capital management and the company's profitability, past studies have used control variables as main working capital variables [3]. Debt ratio, current ratio and company size were used as control variables. Debt ratio (DR) represents the proportion of a firm's assets that are financed by debt. Current ratio (CR) shows the company's ability to pay off its short-term liabilities with its current assets. Finally, the natural logarithm of sales used to measure the size of the firm, was applied.

III. Results

Table 1 provides descriptive statistics of the variables used in the empirical analyses. Overall, the average cash conversion cycle ranged at 114.69 days, which is considerably higher than that of Belgian companies (44.5 days), Spanish small and medium enterprises (SME) (76.3 days), American manufacturing companies (89.94), and Finnish firms (108.8 days), but lower than the average CCC of listed companies on the Athens Stock Exchange (189 days) [3], [5], [6], [7], [12].

TABLE I
DESCRIPTIVE STATISTICS OF VARIABLES

	Minimum	Maximum	Mean	Std. Deviation
ROA	-22.22	19.44	1.88	8.03
DIO	7.28	690.08	114.69	110.96
DSO	9.79	309.75	110.89	66.61
DPO	5.39	107.59	39.80	20.56
CCC	53.25	647.90	185.78	115.23
DR	2.03	120.50	36.79	25.07
CR	0.46	39.95	3.28	4.84
Ln(Sales)	15.16	20.04	18.05	1.16

The credit period granted by companies to their clients ranged at 110.89 days which is distinctly higher relative to Belgian (46.62), Finnish (47.6) and American (53.48) firms [3], [5], [12]. The Romanian companies paid their creditors in 39.80 days on average, which is lower than American (49.5) and Finnish (56.4) firms [5], [12]. The mean inventory for Romanian firms is distinctly higher relative to American (78.63), Belgian (46.62) and Finnish (78.63) companies [3], [5], [12]. Furthermore, ROA is on average 1.88% which is significantly lower relative to Spanish (7.9%) and Finish (8.4%) firms [7], [12]. In an average Romanian manufacturing company, 36.79% of the firm's assets are financed with debt, which is lower relative to Finnish (55.3) firms, but higher than the average DR of American (32) manufacturing companies [5], [12].

In Table 2, we present the Pearson correlation coefficients for the variables used in this study. The Pearson correlation coefficient is the most widely used [5], [12]. It measures the strength of the linear relationship between normally distributed variables. The CCC and its components are shown to correlate negatively with ROA.

TABLE II
PEARSON CORRELATION COEFFICIENTS FOR THE VARIABLES

	ROA	DIO	DSO	DPO	CCC	DR	CR	Ln(Sales)
ROA	1	-0.268	-0.492	-0.380	-0.475	-0.474	0.048	0.198
Sig. (2-tailed)	-	(0.013)	(0.000)	(0.0003)	(0.000)	(0.000)	(0.6626)	(0.0696)
DIO	-0.268	1	-0.137	0.101	0.866	0.039	-0.044	-0.358
Sig. (2-tailed)	(0.013)	-	(0.212)	(0.3571)	(0.000)	(0.7215)	(0.6909)	(0.0008)
DSO	-0.492	-0.137	1	0.516	0.354	0.446	-0.188	-0.168
Sig. (2-tailed)	(0.000)	(0.212)	-	(0.000)	(0.0009)	(0.000)	(0.0851)	(0.1247)
DPO	-0.380	0.101	0.516	1	0.217	0.323	-0.339	-0.106
Sig. (2-tailed)	(0.0003)	(0.3571)	(0.000)	-	(0.0458)	(0.0026)	(0.0015)	(0.3358)
CCC	-0.475	0.866	0.354	0.217	1	0.238	-0.090	-0.423
Sig. (2-tailed)	(0.000)	(0.000)	(0.0009)	(0.0458)	-	(0.0284)	(0.4112)	(0.0001)
DR	-0.474	0.039	0.446	0.323	0.238	1	-0.470	0.291
Sig. (2-tailed)	(0.000)	(0.7215)	(0.000)	(0.0026)	(0.0284)	-	(0.000)	(0.0068)
CR	0.048	-0.044	-0.188	-0.339	-0.090	-0.470	1	-0.297
Sig. (2-tailed)	(0.6626)	(0.6909)	(0.0851)	(0.0015)	(0.4112)	(0.000)	-	(0.0058)
Ln(Sales)	0.198	-0.358	-0.168	-0.106	-0.423	0.291	-0.297	1
Sig. (2-tailed)	(0.0696)	(0.0008)	(0.1247)	(0.3358)	(0.0001)	(0.0068)	(0.0058)	-

ROA has a negative correlation with accounts receivables, implying that if the average collection period decreases it will have a positive impact on the profitability. The correlation coefficients for all measures of the working

capital management are statistically significant, thus, the null hypothesis is rejected. CR and size of the firm are positively correlated with ROA, while DR is negatively correlated with the measure of profitability.

Table III shows the results of applying four regression models to highlight the relationship between the working capital management and profitability of the Romanian companies from manufacturing industry listed on the Bucharest Stock Exchange. In order to estimate, how the working capital management influences the profitability of a firm the regression analysis was used. The panel data methodology, with cross section weights was used for estimation. Due to the fact that heteroscedasticity may be present to some degree, White's heteroskedasticity-consistent covariance matrix is used. In order to carry out a multicollinearity analysis between all independent variables, were determined the variance inflation factors for all independent variables used in this study. There were no notable multicollinearity problems, thus no variable was omitted from this study.

TABLE III
THE RELATION OF THE ROAD WITH WORKING CAPITAL MANAGEMENT

Coefficient estimation	Model I	Model II	Model III	Model IV
Intercept	-19.301	-32.885	-33.883	-32.426
(Prob.)	(0.0029)	(0.0000)	(0.0000)	(0.0000)
CCC	-0.019	-	-	-
(Prob.)	(0.0002)			
DIO	-	-0.007	-	-
(Prob.)		(0.1212)		
DSO	-	-	-0.024	-
(Prob.)			(0.0000)	
DPO	-	-	-	-0.056
(Prob.)				(0.0002)
DR	-0.142	-0.152	-0.143	-0.150
(Prob.)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
CR	-0.208	-0.168	-0.215	-0.204
(Prob.)	(0.0487)	(0.0828)	(0.0095)	(0.0328)
Ln(Sales)	1.655	2.271	2.424	2.324
(Prob.)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R^2	0.487	0.436	0.578	0.585
F-value	18.991	15.471	27.370	28.168

In each of the four regression models were used CCC and its three components one at a time as a proxy for the working capital management. The first model analyzes the relationship between profitability and the CCC. A negative statistically relationship between CCC and ROA was found. This result is in line with the previous studies [3], [5], [6], [7], [12] and implies that companies can improve their profitability by minimizing CCC. The empirical evidence on the relationship between profitability and the days inventory outstanding is provided by the second model. The results support prior evidence of a negative relationship between inventories and firm's profitability, which implies that by prolonging inventory conversion periods, Romanian companies from manufacturing industry can achieve lower profitability levels. The fourth model investigates the influence of account payable deferral period on profitability. Consistent with the correlation analysis, the results indicate a negative relationship between days payable outstanding and the ROA, implying more profitable firms wait lesser to pay their bills. These results differ from that reported U.S. and Greek listed companies [5], [6] but are in line with those related to Finnish firms [12].

IV. CONCLUSION

This study examined the relationship between the working capital management and the firms' profitability using a sample of Romanian companies from the manufacturing industry listed on the Bucharest Stock Exchange between 2011 and 2015. The cash conversion cycle was used in order to measure the working capital, and return on assets for measuring profitability. The cash conversion cycle indicates how effective the firm's directors are managing the working capital. It was determined a negative relationship between the cash conversion cycle and company's profitability, a fact which means that the profitability of the company increases when the cash conversion cycle shortens. The findings also indicate that firms may enhance profitability by decreasing days sales outstanding and managing inventories efficiently. Another way to achieve higher profitability levels is by shortening days payable outstanding. Overall the results indicate that an efficient working capital management is essential for corporate profitability.

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