Working Capital Management and Firm Profitability. Empirical Evidence for the Romanian Industry

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Abstract

The paper aims on empirically testing the connection between a firm's liquidity, or else a firm's ability to manage short-term liabilities, without undue stress and its profitability. We are using both a static and dynamic measure of firm liquidity: the traditional current liquidity ratio alongside one of the most frequent used working capital management indicator, the cash conversion cycle. An empirical analysis is performed based on 50 listed companies from Bucharest Stock Exchange, covering various industries. The empirical results are confirming the previous research that has confirmed the negative connection between the days sales outstanding (DSO), respectively the days inventory outstanding (DIO) and the profitability of the firm, while cash conversion cycle seems to be positively connected with the firm profitability, in contradiction with some of the previous empirical literature.

Key words: ROA, cash conversion cycle, working capital, liquidity
J.E.L. classification: *G30, G32*

1. Introduction

The connection between working capital and the profitability of the firm represents one of the most important financial management concerns. A great number of companies invest large amount of their money in financing working capital. However, there is a trade-off between liquidity and profitability, an excess of liquidity being able also to influence negatively the firm profitability. Cash conversion cycle represents one of the operational efficiency indicators of the firm, showing how well a company deals with paying its liabilities on time, not incurring penalties or even facing bankruptcy risks. Long time inventories or receivables, can put companies at risk, when not adequately capitalized. The small companies are usually the most affected ones, since their short-term financing is more difficult to achieve and often, more expensive.

The motivation of the research lies in the lack of empirical evidence that have focused on the management of the working capital subject and its impact on the firm profitability, with application on the Romanian industry. The remainder of the paper divides into: section 2, which makes a review of the main empirical research that has approached this subject, section 3, which outlines the used methodology and data, section 4, that presents the achieved results while in section 5 we can find some overall conclusions and further research proposals.

2. Theoretical framework

Most of the empirical research that has outlined the relationship between working capital, cash conversion cycle and profitability having in consideration European samples have focused on the more developed European countries and less on the Romanian case. Although scarce, the empirical

papers that have approached the Romanian case can be depicted in the table below (Table no.1), alongside the methodology, time span and main results:

Table no. 1. Main empirical literature on European samples

Authors	**Sample of companies**	**Time span**	**Methodological approach**	**Obtained results**
Botoc (2013)	67 Romanian companies	2001-2011	OLS	Negative connection between cash conversion cycle and profitability, while there is found a positive relationship between cash and profitability
Miloş and Miloş (2014)	Romanian pharmaceutical sector	2002-2012	Pooled EGLS regression	Negative relation between CCC and profitability
Cristea and Cristea (2016)	17 Romanian companies	2011-2015	Pearson correlation	Negative relation between CCC and ROA
Vintilă and Nenu (2016)	50 Romanian companies	2005-2014	Panel data regression	Negative relation between liquidity ratio and ROA
Other European countries				
Authors	**Sample of companies**	**Time span**	**Methodology**	**Results**
Aytac et al. (2016)	France	2003-2014	GMM estimation	No optimal level for CCC, WCM did not impact profitability in a significant way
Chatterjee (2010)	UK	2006-2008	Pearson correlation	Negative relationship between working capital management and profitability
Garcia-Terual and Martinez–Solano (2007)	Spain	1996-2002	Panel data	Negative relationship between working capital management and profitability
Lazaridis and Tryfonidis (2006)	Greece	2001-2004	Pearson correlation	Negative relationship between working capital management and profitability
Deloof (2003)	Belgium	1992-1996	Pearson correlation	Negative relationship between working capital management and profitability

Source: realized by authors, based also on Milos and Milos (2014)

3. Methodology and data

The method of selection of the variables in this study was influenced by the prior empirical research that has analyzed the connection between working capital management indicators and firm profitability. The relationship has been estimated using the following regression:

$$ROA = \alpha + \beta_1 \cdot CCC + \beta_2 \cdot DSO + \beta_3 \cdot DIO + \beta_4 \cdot DPO + \beta_5 \cdot CR + \beta_6 \cdot DR + \beta_6 \cdot SZ + \varepsilon_{i,t}$$

The *cash conversion cycle* is one of the most often used indicator to capture the efficiency of the working capital management. It measures how long an investment is locked up in the production before turning itself into cash, that is to say, the period of time necessary for the inventories to become sales and sales to be made cash, which is further used in order to manage a firm's liabilities. Longer term payables are considered a source for the working capital of a company, while shorter term receivables increase the working capital available to the firms. In the empirical literature, while we find mixed results for the connection between cash conversion cycle and the profitability, the majority of the papers find a negative relation between the two.

Days sales outstanding reflects the duration in days for a company to effectively collect the company account receivables. There is expected a negative connection with the profitability, since a larger days sales outstanding is putting pressure on the available working capital.

Days inventories outstanding reflects the period necessary for the inventories to be turned into cash. There is expected a negative connection with the profitability, since larger periods for transforming inventories into cash affect negatively the achieved profitability.

Days payables outstanding reflects the amount of time necessary for a company to pay its suppliers. The results are also mixed considering the fact that while, in most cases, firms would benefit from a prolonged period of payment, taking it as an interest-free financing period, there could also exist some financial disadvantages arising from the discounts or other incentives that suppliers might offer to earlier payments.

We used several control variables, such as the current liquidity ratio, the indebtedness ratio or the size of the company in order to increase the model consistency. The calculation of the variables can be depicted below (Table no.2):

Table no. 2. Variables used in the panel regressions

Variable		Description
Dependent variable		
Return on assets	ROA	Net income/Total assets
Independent variables		
Cash conversion cycle	CCC	DSO+DIO-DPO
Days sales outstanding	DSO	Accounts receivables/Sales x 365
Days inventory outstanding	DIO	Inventories/Sales x 365
Days payables outstanding	DPO	Total debt/Sales x 365
Current ratio	CR	Current assets/Current liabilities
Indebtedness ratio	DR	Total debt/Total assets
Size of the company	SZ	Ln (Sales)

Source: realized by authors, based on www.investopedia.com

The analysis sample comprises 50 companies from various industries. The period taken into consideration was 2003-2014. The source of the data was provided by Tradeville, one of the main intermediaries on the Romanian stock market. The sample of companies was structured, by industry, as follows (Table no.3):

Table no. 3. Structure of the sample. Number of firms/industry

Sectors	Number of companies	Sectors	Number of companies
Metalurgy	2	Automotive	3
Real estate and constructions	6	Transport and logistics	4
Petroleum and gas	7	Industrial equipments	12
Pharmaceutical	5	Consumer goods	5
Quemical	3	Tourism	3
TOTAL			**50**

Source: realized by authors

4. Results

A panel regression was first estimated with OLS-model and then with fixed and random effects models (we have performed Hausman test, and the null hypothesis, according to which there are no fixed effects in the model was rejected). Consequently, we present below the final estimation of the model:

Table no. 4. Econometric results

Panel EGLS (Cross-section weights) **White Diagonal standard errors & covariance**	
VARIABLES	
CCC	0.0000897*** (0.0000162)
DSO	-0.0000135*** (0.00000268)
DIO	-0.000103*** (0.0000194)
DR	0.034538*** (0.013904)
CR	0.0000865 (0.000189)
LNV	0.0000986 (0.003217)
Total observations	600
Number of companies	50
R-squared	0.4489
DW-stat	1.38
Note: Standard errors in parantheses ***p<0.01, **p<0.05, *p<0.1	

Source: realized by authors

The econometric results show that from all the considered independent variables, the current liquidity ratio and the size of the company are not statistically relevant. As concerns the other independent variables, we can state that, for the analyzed sample of companies, the firm profitability is:

- positively influenced by the cash conversion cycle;
- negatively influenced by the *days sales outstanding* and *days inventory outstanding*;
- positively influenced by the *indebtedness ratio.*

5. Conclusions and further research

The obtained results point to the fact that managers could improve firm profitability by diminishing the days sales outstanding or the days inventories outstanding, result which is in line with the previous empirical analyses. However, the firm profitability is positively influenced by the cash conversion cycle, as well as by the indebtedness ratio (the latter one might have to do with a positive leverage situation). Our study is limited by the relative small number of companies listed on Bucharest Stock Exchange and by the structure of the Romanian listed companies, some industries having more issuers than others on the Bucharest Stock Exchange. Further research could comparatively analyze the situation within the industries, or could take into account larger time spans or larger samples. Furthermore, larger samples belonging to the same industry, but from different countries could also provide an interesting insight on the matter.

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