



Universidade do Minho
Escola de Economia e Gestão

**Short-Term Management and Performance:
Evidence from South European SMEs**

Cláudia Rafaela Henriques Silva

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Master's Dissertation
Master in Finance

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Professor Sónia Silva

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STATEMENT OF INTEGRITY

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Short-Term Management and Performance: Evidence from South European SMEs

Abstract

The main goal of this dissertation is to examine the impact of working capital management on South European SMEs' profitability. The return on assets (ROA) and the return on equity (ROE) are adopted as proxies for financial performance. Working capital management is measured using the net trade cycle. It was gathered a longitudinal panel data from Orbis Europe across the period between 2013 and 2021 for SMEs from Greece, Italy, Portugal, and Spain, analyzed using panel data methodologies.

Consistent with previous literature, this study uncovered a negative relationship between profitability and working capital management.

Moreover, it was also tested if the relationship between profitability and working capital management is non-linear; the results show evidence of a convex relationship for the group of smaller firms, meaning that insufficient investment in working capital might affect performance negatively.

Keywords: Net Trade Cycle; Working Capital; Profitability; Working Capital
Management; Small and Medium Enterprises

Gestão de Curto Prazo e Desempenho: Evidência das PME do Sul da Europa

Resumo

O principal objetivo desta dissertação é examinar o impacto da gestão do fundo de maneiio na rendibilidade das Pequenas e Médias Empresas (PME) do Sul da Europa. A rendibilidade do ativo (ROA) e a rendibilidade dos capitais próprios (ROE) são as *proxies* utilizadas para medir o desempenho financeiro. O indicador de gestão de fundo de maneiio foi medido usando o Ciclo Financeiro de Exploração. Foi recolhido um painel longitudinal de dados da Orbis Europe entre 2013 e 2021 para as PME da Grécia, Itália, Portugal e Espanha, analisado utilizando metodologias de dados em painel.

Consistente com a literatura anterior, este estudo revelou uma relação negativa entre a rendibilidade e a gestão de fundo de maneiio. Além disso, também foi testada se a relação entre a rendibilidade e a gestão do fundo de maneiio é não linear; os resultados mostram evidência de uma relação convexa para o grupo de empresas mais pequenas, o que significa que um investimento insuficiente em fundo de maneiio pode afetar negativamente o desempenho.

Palavras-chave: Ciclo Financeiro de Exploração; Fundo de maneiio; Indicador de Gestão de Fundo de Maneio; Pequenas e Médias Empresas; Rendibilidade

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List of abbreviations

CCC	Cash Conversion Cycle
DIO	Days of Inventory Outstanding
DPO	Days Payable Outstanding
DRO	Days Receivable Outstanding
EBITDA	Earnings Before Interest Taxes Depreciation and Amortization
FE	Fixed Effects
GDP	Gross Domestic Product
GLS	Generalized Least Squares Method
GPM	Gross Profit Margins
IV GMM	Instrumental Variables Generalized Method of Moments
NOM	Net Operating Margin
NTC	Net Trade Cycle
OLS	Ordinary Least Squares
ROA	Return On Assets
ROE	Return On Equity
SG	Sales Growth
SME	Small and Medium Enterprises
TPP	Trade Payable Period
TRP	Trade Receivable Period
TIP	Trade Inventory Period
WCC	Working Capital Cycle
WCM	Working Capital Management

1. Introduction

Working capital management (WCM) and liquidity are considered determinants of companies' profitability. While WCM is about managing current assets and liabilities, the company's ability to pay these liabilities is a measure of the firm's liquidity (Ahmeti et al., 2022).

The impact of working capital management on corporate profitability is related to working capital policies, classified as aggressive or conservative, meaning a shorter or larger working capital cycle, respectively. When well-managed, the working capital can contribute to corporate success once it can assume a preponderant role in firms' long-term strategy, impacting the shareholders' decision whether to invest or not.

Previous studies about WCM support the argument that aggressive working capital policies are more efficient in maximizing a firm's profitability. According to Pais and Gama (2015), aggressive WCM policies imply high levels of non-current assets and little investment in current assets, assuring low cash balances, low levels of inventories, and limiting credit to clients, aiming to increase profitability. This policy corresponds to the basic principles of working capital according to Lamichhane (2019). However, Syed et al. (2015) argue that maintaining efficient levels of current assets and current liabilities is a key driver of performance, where firms should control closely their investment decisions along with their short-term obligations to reduce the risk of financial problems (Nayak & Paluri, 2022).

Therefore, the main purpose of this study is to analyze the impact of working capital management, considered the main indicator of short-run management, on the profitability of small and medium-sized enterprises (SMEs) in South European countries: Greece, Italy, Portugal, and Spain over the 2013-2021 period.

According to Pais and Gama (2015), in 2011 Portuguese SMEs represent over 99% of all companies and were responsible for 77% of all jobs and more than one-half of the total turnover¹.

Overall, due to its large number, one can conclude that SMEs play a crucial role in the economies of Italy, Greece, Portugal, and Spain representing the vast majority of all enterprises and making significant contributions to value-added and employment.

¹ Small and medium-sized enterprises (SMEs) are also significant contributors to the economies of Italy, Greece, and Spain. In 2019, SMEs accounted for 99.9% of all enterprises in Italy and Greece and 99.8% in Spain. They also employed a large proportion of the workforce, ranging from 64.1% in Spain to 78.5% in Italy. In terms of economic impact, SMEs generated between 62-85% of the total value added in these countries in 2018, according to various reports.

However, SMEs in these countries have faced various challenges in recent years, including the impact of the financial crisis, limited access to finance, and high levels of bureaucracy.

Consistent with prior research, e.g., Deloof (2003), García-Teruel and Martínez-Solano (2007), Pais and Gama (2015), and Leal et al. (2022), results provided in this research uncovered a negative relationship between corporate profitability and WCM, meaning that an increase in working capital cycle length has a negative impact on performance. However, and against expectations, results suggest a convex relation between corporate profitability and WCM for smaller firms; a reasonable explanation for this behavior is that smaller firms should invest more in working capital in order to not compromise the production cycle, leading to a negative impact on profitability.

The remaining of this study is organized as follows. The second section summarizes the state of the art of WCM literature, while the third section focuses on the hypotheses and the methodology used in this research. Following this, the fourth section is about the sample description, which leads to the empirical results that are the fifth section. To conclude the sixth section are the final remarks.

2. Literature Review

2.1 The Relationship between Working Capital Management and Corporate Profitability

South European countries are mostly composed of small and medium firms (SMEs) and since working capital management efficiency is a crucial aspect of their survival (Leal et al., 2022), it is extremely important to analyze its impact on corporate profitability.

According to García-Teruel and Martínez-Solano (2007) and Mun and Jang (2015), working capital is defined as the excess of current assets over current liabilities, also assuming that its components include cash, accounts receivable, inventories, accounts payable, and current debt. Nayak and Paluri (2022) state that working capital can be defined as a profitability ratio that reflects the functioning cash flow available and it is a fundamental part of capital reserves along with fixed assets. They also enhance the importance of SMEs' contribution to the nation's employment rates and gross domestic product. Besides, these authors also emphasize the obstacles that SMEs face comparing it to larger firms, which are mainly (potentially) related to poor management.

Small businesses often face difficulties in obtaining long-term financing through traditional financial markets. As a result, they tend to rely on trade credit and bank loans as their main sources of debt. In fact, small firms are known to rely heavily on short-term bank loans to finance their assets, unlike larger companies. Specifically, it was found that a high proportion of the total debt in Spanish manufacturing SMEs is comprised of short-term loans, approximately 82.64% (Baños-Caballero et al., 2016). Pinto et al. (2023) studied the relationship between banks, trade credit, and companies' success and profitability using a sample of Portuguese SMEs. The authors argue that SMEs resort to bank financing in order to fight against financial constraints, however, that source of financing is not enough. Such difficulties stem from the fact that SMEs provide little information, much of the time considered to be not reliable, inducing information asymmetries (Nilsen, 2002; Su & Sun, 2011). Therefore, many companies must resort to alternative means of financing such as trade credit. (Wang et al., 2021; Yang et al., 2021). Profitability helps companies to get bank credit since it improves their financial conditions (Erdogan, 2018). However, Ayed and Zouari (2014), and Legesse and Guo (2020) defend that there is a negative relationship between long-term bank financing and liquidity. This can be justified by the fact that small and medium businesses that have

higher levels of liquidity prefer to use internal resources to finance investment rather than debt (Agyei et al., 2020).

Most businesses in Portugal, Spain, Greece, and Italy are small-sized and have low levels of liquidity, and because these are countries with markedly civil law characteristics, depend heavily on bank credit and commercial credit for the development of their activity (Pinto et al., 2023).

Smaller firms rely more on short-term debt, which is not necessarily bad. A higher proportion of short-term debt could have a positive impact on a company's performance. This can be due to the fact that nominal interest rates on short-term debt are typically lower than those on long-term debt, which reflects the lower risk of default and inflation associated with shorter maturities. Additionally, short-term debt provides greater flexibility for a firm to manage its finances according to changing circumstances, compared to long-term debt which is more inflexible (Baños-Caballero et al., 2016).

Petersen and Rajan (1997) argue that short-term debt makes it easier for bank relations between firms and lenders due to frequent renewals, which might improve credit conditions. Moreover, short-term debt might mitigate agency conflicts between shareholders and creditors. Furthermore, Petersen and Rajan (1997) also provide evidence that small firms can use short-term loans to solve the problem of underinvestment because management is more frequently scrutinized when there is periodic credit renewal.

On the other hand, debt might negatively affect firms' performance due to interest rate risk exposure, such as facing difficulties renewing their short-term loans or simply paying higher interest rates on new loans (Baños-Caballero et al., 2016).

When it comes to evaluating the impact of working capital on performance, several empirical studies provide evidence of a negative relationship between working capital management and firms' profitability (Baños-Caballero et al., 2016; Pais & Gama, 2015; Leal et al., 2022), pointing out the idea that an aggressive policy of working capital management tends to improve corporate profitability. However, some studies provide the opposite evidence, as is the case of Mardones (2021).

Apart from this evidence, some authors went further and found a non-linear relation between working capital management and firms' performance (e.g., Baños-Caballero et al., 2010, Leal et al., 2022). Moreover, it seems that firms rely less on trade credit when

leverage increases, meaning that financial debt competes with trade credit extended by creditors (Baños-Caballero et al.,2010).

Gitman and Zutter (2016) argue that working capital management is a determinant element that reflects an increase in sales and in how to achieve better results in order to have an optimal level of liquidity and profitability. Keeping this in mind, Ardi et al. (2022) defend that the efficacy of working capital management is crucial for a company's balance level of liquidity and return. Hence, optimizing the level of investment in working capital will minimize the urge for financing current assets, leading to a positive impact on corporate profitability.

This is reinforced by previous findings in which WCM is seen as one of the most important areas of corporate finance where financing/investment decisions on short-term assets directly affect profitability. Therefore, Singhania and Mehta, (2017); Le (2019); Ren et al. (2019), and Amponsah-Kwatiah and Asiamah, (2020) point out two main reasons to highlight the importance of working capital management across businesses: i) it englobes operations and financing decisions of a company, which is part of current assets and current liabilities; and ii) it can adjust its investment (on current assets) during an economic recovery period.

Summing up, WCM is considered vital in financial management for its effect on performance, risk, and corporate value, but also because it is one of the requirements to achieve financial success when aligned with corporate strategy (Amponsah-Kwatiah & Asiamah, 2020).

2.2 Working Capital Management Indicators

One of the most used working capital management (WCM) indicators is the Cash Conversion Cycle (CCC), which is considered an adequate proxy for WCM efficiency (Singhania & Mehta, 2017; Wang, 2019; Boisjoly et al., 2020). In sum, the CCC corresponds to the interval of time needed to convert cash expenses into cash inflows. A shorter (larger) CCC indicates aggressive (conservative) WCM practices (Chang, 2018), meaning shrinking (augmenting) accounts receivable collection and inventory days and extending (shortening) the period of accounts payable (Boisjoly et al., 2020). On the other hand, companies can use debt to fund the company's operations, which also implies less financial flexibility, greater financial risk, and exposure to third parties.

Some authors, such as Neves et al. (2023) and Alarussi and Gao (2021) conclude that there is a negative relationship between leverage and the CCC.

The CCC proposes an approach to liquidity taking into account items collected from the balance sheet and income statement. Unlike the current ratio, which is calculated by dividing current assets by current liabilities, the CCC incorporates the period of time of firms' receivables, inventory, and payables turnover performance. The longer the time to exchange current assets into inflows, the more investment in cash and non-cash assets is needed. Overall, the shorter the CCC, the more healthy a company seems to be, which affects positively profitability (Richards & Laughlin, 1980). Amponsah-Kwatiah and Asiamah (2020) describe company profitability as the capacity to improve the decisions on the operating area and investment strategies toward financial stability. Tran et al. (2017) claimed that stable cash flows are crucial in order to continue a business but also that sufficient working capital can increase profitability. The CCC is calculated as the difference between the number of days of accounts receivable, plus the number of days of inventories, minus the number of days of accounts payable. Extending long credit terms for customers and granting large inventory holding reduces available cash to finance the working capital. Extending the number of days of inventories denotes additional costs in managing inventory and will negatively affect profitability if the revenues generated from large inventory do not cover the additional storing costs. On the other side, a longer number of days of accounts payable might favor firms' profitability, although it also can damage their reputation. Previous literature (Le, 2019; Prasad et al., 2019; Ren et al., 2019; Fernández-López et al., 2020; Alarussi & Gao, 2021) find that a larger CCC, i.e, a longer period between paying expenses and receiving inflows, is negatively associated with profitability, supported by the majority of previous research (79%) that found a negative significant relationship between the CCC and profitability. However, Amponsah-Kwatiah (2020) studied manufacturing firms in Ghana and uncover a positive relationship between CCC and ROA; the author defends that longer a CCC can increase profitability since implies a longer period of receivables and a number of days of inventories that overcome the payables period, which translates into an increase in sales. In addition, Amponsah-Kwatiah (2020) also believes that longer credit terms give extra time for customers to check the quality of the stock bought on credit, which could attract sales and eventually increase profitability. Besides, a longer period of inventory stored could drive economies of scale in order to reduce production costs per unit and prevents the loss of sales in case of stock-out, hence increasing profitability. Baños-Caballero et al. (2011) claim that their study proves a nonlinear relationship between the CCC and profitability, arguing that increasing the working capital ratio will

enhance profitability but only until it reaches its optimal point; thereafter the optimal point, investing in working capital will have a negative impact on profitability. Such evidence is supported by further studies, like the research conducted by Boțoc and Anton (2017).

Besides the CCC, prior literature used the Net Trade Cycle (NTC) as a WCM. Soenen (1993) was the first to claim the advantages of the NTC as a more simplified and effective measure of working capital management (WCM) in comparison with the CCC. The NTC translates the number of days-sales companies need to convert their sales into cash.

Therefore, the NTC plays a crucial role in working capital management. Optimizing the net trade cycle involves increasing days of payables outstanding, reducing days of inventory outstanding, and reducing days of sales outstanding. While a negative net trade cycle, where the company receives payments before paying its accounts payable, may seem ideal, its impact on profitability should be taken into consideration. Ultimately, achieving an efficient NTC improves internal operations, profitability, market value, and the net present value of cash flows.

The net trade cycle mirrors the efficiency of a company's working capital management. A shorter net trade cycle indicates that the company is able to convert its investments in inventory and resources into cash briefly, which can lead to improved profitability. By minimizing the time between cash outflows and cash inflows, a company can reduce the need for external financing and associated costs.

Taking all of this into consideration, the NTC is the measure of working capital management chosen to perform this study.

3. Hypotheses and Methodology

3.1 Hypotheses

The main purpose of this dissertation is to analyze the impact of working capital management on SMEs' performance in Italy, Portugal, Greece, and Spain.

The Net trade cycle (NTC) proxies the working capital management indicator and the performance indicators used in this study are return on assets (ROA) and return on equity (ROE). Following previous literature, (one example is García-Teruel & Martínez-Solano, 2007), the following hypothesis is formulated:

Hypothesis 1 – There is a negative relationship between a firm's profitability and working capital management.

The seminal paper of Baños-Caballero et al. (2011) found a non-linear relationship between profitability and working capital. The authors provide evidence that companies have an optimal point of working capital management that maximizes profitability. Hence, regarding the main objective of this study, the next hypothesis is the following:

Hypothesis 2 – There is an optimal point of working capital management that maximizes corporate profitability.

3.2 Methodology

In order to test the research hypotheses formulated in the previous section, it was applied panel data methodologies.

This is a longitudinal study, i.e., several number of enterprises are studied at the same time over a period of time (i.e., a panel database). Each company has several specific characteristics, which increases the sample heterogeneity.

According to Baum (2006), the specific firms' characteristics are fixed over time, although they can also be random. To analyze if those effects are random or fixed will be applied the Hausman test. Specifically, the null hypothesis of this test postulates that effects are random; if the null hypothesis is rejected, the effects are considered to be fixed. The fixed effects model assumes that individual-specific effects are correlated with the independent variables, while the random effects model assumes that individual-specific effects are uncorrelated with the independent variables. The Hausman test measures the difference between the two sets of coefficients, taking into account their respective standard errors. If the difference is statistically significant, meaning the significance level

is lower than 0.05, then the fixed effects model is preferred. If the difference is not statistically significant, then the random effects model is the model that fits best².

The fixed effects model (FE) is a statistical technique used in panel data analysis to account for individual-specific effects that remain constant over time. The model is used to estimate the relationship between a dependent variable and one or more independent variables while controlling for unobserved individual-specific effects. Its main characteristic is that fixed effects are individual-specific and remain constant over time (Baum, 2006). In addition, the FE model captures unobserved individual-specific factors that affect the dependent variable. One of the FE assumptions is that effects that are invariant over time are (potentially) correlated with the independent variables and need to be included in the model to avoid biased estimates. However, the fixed effects model cannot be estimated for individuals that have no within-group variability Baum (2006).

Nevertheless, the unobservable heterogeneity in the fixed effects model is potentially correlated with the independent and control variables, which is a form of endogeneity. If this is the case, that means the independent variables are being affected by the dependent variable, and not *vice versa*. Endogeneity problems can be mitigated using instrumental variables (IV). This method provides a consistent estimate, supposing the existence of valid instruments. FE models assume a limited form of endogeneity, i.e., it is assumed that the observations on the same company in two different time periods can be correlated, but the observations between two different corporations are not.

In this context, previous literature assumed as valid instruments the independent variables lagged one or more periods (García-Teruel & Martínez-Solano, 2007).

Moreover, a longitudinal panel is potentially affected by the presence of heteroskedasticity and serial correlation. Following Baum (2006), one way to overcome those issues is the adoption of clustered robust standard errors.

² In the case the effects are fixed, the appropriate estimator is the OLS (ordinary least-squares method); on the other hand, for random effects models, the proper estimator is the GLS (generalized least-squares method). The purpose of the OLS method is to find the line that best fits the data, in terms of minimizing the sum of squared differences between the observed and predicted values. The GLS provides a more efficient estimator of the parameters of a linear regression model in the presence of correlated errors.

4. Sample Description

4.1 Data

The information needed to perform this study was retrieved from Orbis Europe across the period 2013-2021. Consistent with the main goal of this study, it was collected data about total assets, sales, receivables, payables, inventories, current and non-current liabilities, net income, and shareholders' equity. The first step relied on selecting only active private limited companies, partnerships, and sole trader/proprietorships from South European countries: Greece, Italy, Portugal, and Spain. Regarding the industry, it included all NACE codes (reduced to a 2-digit code), except banks, extremely regulated, state-owned, and traded companies.

Taking into account the aim point of this study – to examine the impact of working capital management on the profitability of South European SMEs - the size of firms was defined according to the parameters established by the EU Recommendation of 6th May of 2003 about SMEs: the number of employees varies between 10 to 250, and total assets lower than 43 million euros.

The dataset was empirically treated in STATA where anomalies such as lack of observations on the main variables - total assets, sales, receivables, payables, inventories, current and non-current liabilities, and shareholders' equity were eliminated. Besides, in order to limit the extreme values, all variables were winsorized at a 1% level. This screen resulted in about 90,000 companies, counting 820,708 observations.

4.2 Variables

According to previous literature (e.g., García-Teruel & Martínez-Solano, 2007; Nazir & Afza, 2009; Baños-Caballero et al., 2016; Pais & Gama, 2015; Leal et al., 2022), and in order to test the hypotheses formulated before, the following variables were included in this study, divided into dependent, independent and control variables.

4.2.1 Dependent Variables

Following prior literature, the proxies for performance are profitability variables: Return on Assets (ROA) and Return on equity (ROE).

ROA is the ratio between net income and total assets. This ratio is important in order to understand if the company is using its resources efficiently,

ROE is the ratio between net income and shareholders' equity. This ratio reflects if the company is returning profits to its shareholders.

4.2.2 Independent Variables

The working capital management (WCM) indicator used in this study is the Net Trade Cycle (NTC). This indicator measures the time it takes a company to transform its net working capital into cash. Therefore: $NTC = \text{Days-Sales Receivable Outstanding (DRO)} + \text{Days-Sales of Inventory Outstanding (DIO)} - \text{Days-Sales Payable Outstanding (DPO)}$, where DRO is the time (in days) it takes a company to receive from its debtors: $DRO = (\text{Debtors}/\text{Turnover}) * 365$; DIO means the time it takes for a company to sell its inventory, $DIO = (\text{Inventories}/\text{Turnover}) * 365$; DPO measures, in days, the time it takes for a company to pay back to its creditors: $DPO = (\text{Creditors}/\text{Turnover}) * 365$.

Several prior studies (e.g., Deloof, 2003) uncover a negative relationship between profitability and working capital management components DRO, DIO, and DPO, respectively, from which authors conclude that shortening those WCM components might affect profitability positively.

4.2.3 Control Variables

Once, control variables are based on former studies (e.g., García-Teruel & Martínez-Solano, 2007), which are the following:

- Size is measured as the total assets' logarithm;
- Sales Growth measures the increase or decrease of sales during a certain period: $\text{Sales Growth} = (\text{Turnover year } n / \text{Turnover year } n-1) - 1$. There is evidence based on previous literature of a positive relationship between sales growth and profitability, e.g., Deloof (2003), and Liu and Zhao (2014) suggest that sales growth is fundamental on determine the use of trade credit by a company;
- Leverage measures the total liabilities used by a company in order to accomplish its obligations: $\text{Leverage} = \text{Total Liabilities} / \text{Total Assets}$.

4.3 Descriptive Statistics

Table 1 reports descriptive statistics for dependent, independent, and control variables (already defined in the previous section) of the sample, during the period 2013-2021.

Table 1 - Descriptive Statistics

Variable	Obs.	Mean	Median	Std. Dev.
ROA	813,171	0.0949	0.0790	0.0948
ROE	820,446	0.0956	0.0791	0.3606
NTC	819,986	81.75	60.34	96.18
SIZE	820,708	7.98	7.97	1.21
Sales Growth	732,630	0.0413	0.0100	0.2243
Leverage	820,305	0.6369	0.6644	0.2511

This table reports descriptive statistics between the period of 2013 and 2021. The descriptive statistics used are the following: number of observations, mean, median, and standard deviation. In order to perform this analysis, it was used the following variables. ROA = Net Income/Total Assets; ROE= Net Income/Shareholders; NTC= Days Receivable Outstanding + Days of Inventory Outstanding – Days Payable Outstanding; SIZE=ln (Total Assets); Sales = (Turnover year n/ Turnover year n-1) – 1; Leverage = Total Liabilities/ Total Assets.

As can be seen in Table 1, the descriptive statistics show that ROA is, on average, 9.5 percent while ROE is slightly higher at approximately 9.6 percent. The mean size of firms is about 2,925 million euros, meaning this sample is formed of small firms. In what concerns the firm's sales growth (SG) is, on average, 4.1 percent annually. The Net Trade Cycle (NTC) displays a mean value of 82 days-sales, far from the median of 60 days-sales. Consistent with previous research (e.g., Pais & Gama, 2015) the Leverage ratio displays a mean of 64%, meaning that more than half of SMEs' total assets are financed by liabilities.

4.4 Pearson's Correlation

Table 2 demonstrates Pearson's correlation coefficients and their significance levels across all variables used in the subsequent multivariate analysis between the period of 2013 and 2021.

Table 2- Pearson's Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) ROA	1					
(2) ROE	0.4253*	1				
(3) NTC	-0.1532*	-0.0762*	1			
(4) SIZE	-0.0542*	-0.0197*	0.238*	1		
(5) Sales Growth (SG)	0.0286*	0.0256*	-0.0123*	0.0948*	1	
(6) Leverage	-0.2447*	-0.0145*	-0.088*	-0.1216*	-0.0008	1

This table synthesizes the results from Pearson's correlation between the period 2013 and 2021. * provides statistical significance, at least, at the 5% level. To perform this analysis, it was used the following variables ROA = Net Income/Total Assets; ROE= Net Income/Shareholders; NTC= Days Receivable Outstanding + Days of Inventory Outstanding – Days Payable Outstanding; SIZE=ln (Total Assets); Sales = (Turnover year n/ Turnover year n-1) – 1; Leverage = Total Liabilities/ Total Assets.

Most of the correlation coefficients reported in Table 2 display statistical significance, at least, at the 5 percent level.

As expected, i.e., based on previous literature findings (e.g. Baños-Caballero et al., 2016; Pais & Gama, 2015; Leal et al., 2022), profitability measures – ROA and ROE – are negatively correlated with the WCM indicator – NTC, and also negatively correlated with Size and Leverage variables, being positively correlated with Sales Growth. The negative relation between profitability and NTC length denotes that a longer NTC impacts negatively firms' performance.

Despite the evidence presented in Table 2, the correlation analysis does not differentiate between causes from consequences. Therefore, is not possible to conclude whether the NTC influences profitability or *vice versa*, only regression analysis allows to provide such evidence. Thus, the next Chapter will present the empirical results from regression analysis.

5. Empirical Results

5.1 The impact of Working Capital Management on Profitability

According to previous findings (García-Teruel & Martínez-Solano, 2007; Pais & Gama, 2015; Leal et al., 2022), the relationship between working capital management and profitability is expected to be negative, meaning that decreasing the WCM length has a positive impact on firms' performance.

To test Hypothesis 1, i.e., there is a negative relationship between a firm's profitability and working capital management, it will be followed previous literature and test equations (1) and (2).

$$ROA_{i,t} = \beta_0 + \beta_1 NTC_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 SG_{i,t} + \beta_4 Leverage_{i,t} + \lambda_t + \eta_i + \varepsilon_{i,t} \quad (1)$$

$$ROE_{i,t} = \beta_0 + \beta_1 NTC_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 SG_{i,t} + \beta_4 Leverage_{i,t} + \lambda_t + \eta_i + \varepsilon_{i,t} \quad (2)$$

Where ROA and ROE are the dependent variables. The independent variable – NTC - is a proxy for working capital management, as described in section 4.2.2. The control variables – Size, Sales Growth (SG), and Leverage – are described in section 4.2.3. λ_t is a set of time dummies that captures time effects. η_i measures the unobservable heterogeneity of the individual specific effects invariant over time that can be related to firm, country and/or industry characteristics. $\varepsilon_{i,t}$ is the error term.

Table 3 reports the results from testing equations (1) and (2) – a linear relationship between profitability and working capital management - as formulated by Hypothesis 1.

**Table 3 - Results from testing the linear relationship between Profitability
and Working Capital Management**

Methodology:	Pooled OLS	Pooled OLS	FE	FE	FE	FE
Dependent variable:	ROA	ROE	ROA	ROE	ROA	ROE
Model:	(1)	(2)	(3)	(4)	(5)	(6)
Net Trade Cycle	-0.0002*** (-90.26)	-0.0003*** (-47.14)	0.0000*** (2.70)	-0.0001*** (-4.09)	-0.0002*** (-86.52)	-0.0003*** (-50.39)
Size	-0.0037*** (-19.01)	-0.0005 (-1.00)	0.0012* (1.78)	0.0161*** (5.90)	-0.0037*** (-16.95)	-0.0003 (-0.54)
Sales Growth (SG)	0.0131*** (27.24)	0.0393*** (20.36)	0.0068*** (15.99)	0.0158*** (7.52)	0.0111*** (21.22)	0.0262*** (12.48)
Leverage	-0.1023*** (-111.28)	-0.0304*** (-11.49)	-0.1921*** (-105.58)	-0.1044*** (-12.33)	-0.1130*** (-114.72)	-0.0430*** (-14.98)
Constant	0.2025*** (116.72)	0.1440*** (31.02)	0.1996*** (35.38)	0.0431** (1.98)	0.1918*** (76.21)	0.1212*** (16.89)
Observations	725,225	731,912	725,225	731,912	725,225	731,912
R-squared	0.097	0.007	0.093	0.006	0.133	0.016
Firm FE			Yes	Yes		
Year FE			Yes	Yes	Yes	Yes
Country FE					Yes	Yes
Industry FE					Yes	Yes
Hausman Test (P-value)	0,0000	0,0000				

This table reports the results from the regression analysis using Pooled OLS and the Fixed Effects (FE) methodologies for the period of 2013 and 2021. ***, ** and * demonstrate the statistical significance at the levels of 1%, 5% and 10% correspondingly. To perform this analysis, it was used the following variables. ROA = Net Income/Total Assets; ROE= Net Income/Shareholders Equity; Net Trade Cycle= (Days Receivables Outstanding + Days of Inventory Outstanding – Days Payable Outstanding) *365; SIZE=ln (Total Assets); Sales = (Turnover year n/ Turnover year n-1) – 1; Leverage = Total Liabilities/ Total Assets. The variable constant corresponds to the intercept term. Robust t-statistic is in parentheses, clustered by firm. The Hausman test is performed to compare the consistency and efficiency of a fixed-effects *versus* random-effects model; P-value from this test is in parentheses. R square is expressed in percentage. Models (3)-(4) control for firm/year FE. Models (5)-(6) control for country/industry/year FE. The industry is a 2-digit NACE code.

As can be seen in Table 3 above, the null hypothesis of the Hausman test is rejected, meaning that the effects arising from the sample are fixed. Models (3)-(6) control for those fixed effects in different schemes (as described in Table 3).

Moreover, most of the coefficients' estimates of the variable of interest – NTC - are negative (except in model (3)) and statistically significant at the 1 percent level, providing evidence of a negative relationship between working capital management and profitability. Taking models (5) and (6) as examples, an increase of one day in the net trade cycle leads to a decrease of 0.02% in ROA and 0.03% in ROE, holding all else equal. Regarding control variables, SIZE displays inconsistent results across models. As signaled by correlation analysis, the relationship between profitability and sales growth is positive and statistically significant. As already expected, Leverage has a negative

impact on profitability; an increase of one percent in Leverage conducts to a decrease of 11.3% in ROA and 4.3% in ROE, as can be seen in models (5) and (6), respectively, assuming all else equal.

In sum, the evidence provides in Table 3 highlights that a shorter net trade cycle of SMEs from South European countries is generally associated with better financial performance, as it allows a company to invest more in growth opportunities and avoid unnecessary financing costs. Thus, this evidence supports Hypothesis 1. Furthermore, this result is consistent with previous literature (García-Teruel & Martínez-Solano, 2007; Pais & Gama, 2015; Leal et al., 2022).

5.2 The non-linear Relationship between Profitability and Working Capital Management

In order to test Hypothesis 2 - a concave relationship between working capital management and profitability – and following previous studies (e.g., Baños-Caballero et al., 2011), equations (3) and (4) will be regressed. Table 4 presents the results.

$$ROA_{i,t} = \beta_0 + \beta_1 NTC_{i,t} + \beta_2 NTC^2_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 SG_{i,t} + \beta_5 Leverage_{i,t} + \lambda_t + \eta_i + \varepsilon_{i,t} \quad (3)$$

$$ROE_{i,t} = \beta_0 + \beta_1 NTC_{i,t} + \beta_2 NTC^2_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 SG_{i,t} + \beta_5 Leverage_{i,t} + \lambda_t + \eta_i + \varepsilon_{i,t} \quad (4)$$

Almost all variables are already described before, except NTC^2 , which corresponds to the Net Trade Cycle (NTC) square.

Table 4 below demonstrates the results from equations (3) and (4).

Table 4 – Results from testing a non-linear relationship between Profitability and Working Capital Management

Methodology:	FE	FE	FE	FE
Dependent variable:	ROA	ROE	ROA	ROE
Model:	(1)	(2)	(3)	(4)
Net Trade Cycle	-0.0001*** (-14.25)	-0.0002*** (-11.31)	-0.0002*** (-47.57)	-0.0004*** (-31.18)
Net Trade Cycle ²	2.26e-07*** (19.46)	6.42e-07*** (10.49)	1.66e-07*** (14.43)	4.08e-07*** (9.99)
Size	0.0009 (1.34)	0.0152*** (5.57)	-0.0037*** (-16.96)	-0.0004 (-0.56)
Sales Growth (SG)	0.0069*** (16.40)	0.0163*** (7.76)	0.0112*** (21.32)	0.0263*** (12.54)
Leverage	-0.1930*** (-105.95)	-0.1068*** (-12.60)	-0.1138*** (-115.33)	-0.0449*** (-15.65)
Constant	0.2052*** (36.26)	0.0592*** (2.71)	0.1935*** (76.68)	0.1257*** (17.42)
Observations	725,225	731,912	725,225	731,912
R-squared	0.093	0.006	0.133	0.016
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes		
Country FE			Yes	Yes
Industry FE			Yes	Yes

This table presents the results from the regression analysis using the Fixed Effects methodology across the period of 2013 and 2021. ***, ** and * demonstrate the statistical significance at the levels of 1%, 5% and 10%, correspondingly. In order to perform this analysis, it was used the following variables. ROA = Net Income/Total Assets; ROE= Net Income/Shareholders Equity; Net Trade Cycle= Days Receivables Outstanding + Days of Inventory Outstanding – Days Payable Outstanding; SIZE=ln (Total Assets); Sales = (Turnover year n/ Turnover year n-1) – 1; Leverage = Total Liabilities/ Total Assets. The variable constant corresponds to the intercept term. Robust t-statistic is in parentheses, clustered by firm. R square is expressed in percentage Models (1)-(2) control for firm/year FE. Models (3)-(4) control for country/industry/year FE. The industry is a 2-digit NACE code.

In this analysis, the variables of interest are NTC and NTC², which coefficients' estimates are statistically significant at the one percent level.

Contrary to the expectations, results in Table 4 provide evidence of a convex relationship between WCM and profitability. Based on findings documented by prior studies, Hypothesis 2 postulates a concave relationship between WCM and profitability, meaning there is an optimal point in WCM that maximizes profitability. However, results provided in Table 4 document the reverse; it seems there is a point of WCM that minimizes the profitability of SMEs from South European countries. Results demonstrate a negative coefficient estimate of NTC, displaying a positive estimate for its square (NTC²) across models. It seems that for low levels of investment in working capital, profitability will

decrease, reaching a minimum, whereas investing more in working capital leads to an increase in profitability. One possible explanation is that results are being affected by endogeneity issues. The next section will deal with those issues.

So far, results lead to a rejection of Hypothesis 2.

5.3 Robustness Checks

This section aims to validate the results obtained in the previous sections. As mentioned before (in the Methodology description), endogeneity issues might undermine previous results.

Following former research (García-Teruel & Martínez-Solano, 2007; Pais & Gama, 2015), equations (1)-(4) will be re-estimated using Instrumental Variables (IV) methodology, where lagged values of the independent variable (considered as a potentially endogenous variable) are used as valid instruments. Table 5 describes the results, where models (1)-(4) replicate the estimations provided in Table 3 and models (5)-(8) replicate regressions in Table 4.

In what concerns testing the linear relationship between profitability and WCM (models (1)-(4)), the coefficients' estimates are very similar in sign and magnitude to the ones shown in Table 3. Results provided by models (5)-(8) validate a convex relationship between profitability and WCM, which was questioned before, in section 5.2, due to the concerns raised by endogeneity issues.

Table 5 – Results from testing the (non)linear relationship between Profitability and Working Capital Management: Robustness Tests

Methodology:	IV	IV	IV	IV	IV	IV	IV	IV
Dependent variable:	ROA		ROE		ROA		ROE	
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net Trade Cycle	-0.0002*** (-95.34)	-0.0002*** (-94.37)	-0.0004*** (-51.69)	-0.0004*** (-51.17)	-0.0003*** (-49.13)	-0.0003*** (-54.70)	-0.0005*** (-30.33)	-0.0005*** (-30.01)
Net Trade Cycle ²					1.8e-07*** (12.33)	5.1e-07*** (33.49)	8.1e-07*** (15.82)	8.0e-07*** (15.71)
Size	-0.0016*** (-7.80)	-0.0032*** (-15.00)	0.0046*** (7.90)	0.0018*** (2.98)	-0.0015*** (-7.33)	-0.0040*** (-18.85)	0.0035*** (5.99)	0.0007 (1.16)
Sales Growth (SG)	0.0143*** (24.92)	0.0146*** (25.56)	0.0315*** (13.84)	0.0317*** (13.94)	0.0145*** (25.40)	0.0106*** (18.87)	0.0293*** (12.90)	0.0295*** (12.98)
Leverage	-0.1068*** (-111.34)	-0.1165*** (-113.03)	-0.0305*** (-10.81)	-0.0429*** (-14.16)	-0.1077*** (-111.76)	-0.1151*** (-111.12)	-0.0235*** (-8.40)	-0.0354*** (-11.78)
Constant	0.1883*** (102.88)	0.1963*** (101.24)	0.1187*** (23.46)	0.1390*** (25.65)	0.1899*** (103.19)	0.2032*** (104.20)	0.1255*** (24.79)	0.1463*** (26.98)
Observations	615,537	615,537	621,574	621,574	615,537	615,537	621,574	621,574
R-squared	0.110	0.116	0.009	0.010	0.111	0.116	0.010	0.010
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes		Yes		Yes		Yes	
Country FE		Yes		Yes		Yes		Yes
Industry FE		Yes		Yes		Yes		Yes

This table describes the results from using IV methodology between the period of 2013 and 2021. ***, ** and * demonstrate the statistical significance at the levels of 1%, 5% and 10%, correspondingly. In order to perform this analysis, it was used the following variables. ROA = Net Income/Total Assets; ROE= Net Income/Shareholders Equity; Net Trade Cycle= Days Receivables Outstanding + Days of Inventory Outstanding – Days Payable Outstanding; SIZE=ln (Total Assets); Sales = (Turnover year n/ Turnover year n-1) – 1; Leverage = Total Liabilities/ Total Assets. The variable constant is the intercept term. Robust z statistic is in parentheses, clustered by firms. R square is expressed in percentage. Models (1), (3), (5), and (7) control for firm/year FE. Models (2), (4), (6), and (8) control for country/industry/year FE. Industry is 2-digit NACE code.

Thus, the robustness checks give further support to Hypothesis 1, i.e., a negative relationship between corporate profitability and working capital management, leading to the rejection of a concave relation between profitability and working capital management, as formulated in Hypothesis 2.

Furthermore, one last test was performed: to divide the sample based on the SIZE variable – larger firms are included in the group above the median, and smaller firms are included in the group below the median. The rationale is that larger firms adopt different practices of WCM, so the impact on profitability will be different from the smaller ones. Models (5)-(8) of Table 5 were re-estimated for the subgroups of the above-lower SIZE median. Table 6 reports the results.

Table 6 – Results from testing the (non) linear relationship between Profitability and Working Capital Management: Robustness Tests by SIZE

Methodology:	IV	IV	IV	IV	IV	IV	IV	IV
Dependent variable:	ROA		ROE		ROA		ROE	
Group:	Larger	Smaller	Larger	Smaller	Larger	Smaller	Larger	Smaller
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net Trade Cycle	-0.0002*** (-24.91)	-0.0004*** (-44.22)	-0.0003*** (-14.85)	-0.0006*** (-18.61)	-0.0002*** (-23.88)	-0.0004*** (-43.10)	-0.0003*** (-14.73)	-0.0006*** (-18.01)
Net Trade Cycle ²	-4.1e-08** (-2.41)	4.9e-07*** (15.68)	-8.6e-08 (-1.41)	3.3e-07*** (2.70)	-5.8e-08*** (-3.41)	4.5e-07*** (14.53)	-9.0e-08 (-1.47)	3.0e-07** (2.43)
Size	-0.0051*** (-13.66)	0.0038*** (7.68)	-0.0026** (-2.51)	0.0173*** (11.77)	-0.0052*** (-13.94)	0.0005 (0.97)	-0.0028*** (-2.65)	0.0111*** (7.33)
Sales Growth (SG)	0.0211*** (27.54)	0.0058*** (6.84)	0.0540*** (18.84)	0.0067* (1.91)	0.0213*** (27.93)	0.0061*** (7.30)	0.0541*** (18.88)	0.0071** (2.01)
Leverage	-0.1003*** (-80.15)	-0.1148*** (-82.84)	-0.0371*** (-9.65)	-0.0250*** (-6.30)	-0.1052*** (-80.56)	-0.1299*** (-84.48)	-0.0394*** (-9.75)	-0.0480*** (-10.99)
Constant	0.2144*** (60.89)	0.1601*** (42.31)	0.1817*** (18.29)	0.0320*** (2.97)	0.2098*** (58.91)	0.1811*** (45.40)	0.1819*** (18.19)	0.0771*** (6.83)
Observations	306,494	309,043	308,602	312,972	306,494	309,043	308,602	312,972
R-squared	0.120	0.109	0.013	0.009	0.124	0.118	0.013	0.010
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes				
Country FE					Yes	Yes	Yes	Yes

This table describes the results from using IV methodology between the period of 2013 and 2021. ***, ** and * demonstrate the statistical significance at the levels of 1%, 5% and 10%, correspondingly. In order to perform this analysis, it was used the following variables. ROA = Net Income/Total Assets; ROE= Net Income/Shareholders Equity Net Trade Cycle= Days Receivables Outstanding + Days of Inventory Outstanding – Days Payable Outstanding; SIZE=ln (Total Assets); Sales = (Turnover year n/ Turnover year n-1) – 1; Leverage = Total Liabilities/ Total Assets. The variable constant is the intercept term. Robust z statistic is in parentheses, clustered by firms. R square is expressed in percentage. Models (1)-(4) control for firm/year FE. Models (5)-(8) control for country/year FE. Larger refers to the 50% of the observations that are above the SIZE median; Smaller refers to the 50% of the observations that are under the SIZE median.

A pattern outstands from the results provided in Table 6: the non-linear relationship between profitability and WCM is inconclusive for the group of larger firms (models (1), (3), (5), (7)), while that relationship seems to be convex for the smaller group of firms (models (2), (4), (6), (8)).

Hence, results suggest that the group of smaller firms leads the evidence provided in Table 5 that shows a convex relation between profitability and WCM. One reasonable explanation is that smaller firms, which face a higher degree of financial constraints, should invest more in working capital in order to increase their profitability. Perhaps investing more in working capital would increase the ability of smaller firms in extending more trade credit to their clients, store more inventories to prevent interruptions in the operating cycle, and augmenting bargain power in the relationships with their suppliers. This last group of results supports the decision of rejecting Hypothesis 2.

6. Concluding Remarks

Working capital management is an important driver that significantly affects the performance of SMEs, particularly in the four countries in this study: Italy, Greece, Portugal, and Spain. Efficient working capital management can increase profitability, liquidity, and solvency, while poor management can result in cash flow problems and financial distress. Therefore, firms should prioritize effective working capital management practices to ensure their long-term success and sustainability in today's highly competitive business environment. It is crucial for these SMEs to continuously monitor and manage their working capital to avoid any potential financial difficulties and remain competitive in their respective markets.

The main purpose of this study is to test the impact of working capital management on the corporate profitability of SMEs from South European countries. The findings revealed a negative relationship between profitability and WCM, which is consistent with prior research conducted by, e.g., Deloof (2003), García-Teruel and Martínez-Solano (2007), Pais and Gama (2015), and Leal et al. (2022).

Furthermore, and contrary to what was expected, results did not provide consistent evidence of a non-linear (concave) relationship between profitability and WCM, even suggesting a convex relationship for the group of smaller firms; results suggest that smaller firms should expand investment in working capital to impact positively profitability.

A huge limitation of this study is the financial information. The sample used in this study is formed of non-listed (private) firms, whose financial statements are not, on average, audited by external sources.

Another constraint that turned out to be a limitation was the time to finish this study, much more would be done if the deadline was enlarged.

For further investigation, it would be interesting to disentangle the motives that drive the convex relationship documented for the smaller group of firms but also include some other tests related to the net trade cycle components and link up all of this with the quality of corporate governance.

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