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INVESTIGATING THE FACTORS INFLUENCING WORKING CAPITAL AND PROFITABILITY IN CHILEAN SMES: A STATISTICAL ANALYSIS

Santiago Chalmers
Department of Management and Innovation Systems, University of Salerno

Abstract: This study investigates the relationship between working capital and profitability of Chilean companies. A sample of manufacturing companies from the metropolitan region of Santiago was selected for the survey. The data covered five years to allow a sufficiently significant observation time horizon. The generalised least squares method was used to develop the analysis to obtain more reliable results. The empirical results suggest that the relationship between the single elements of working capital and firms' profitability presents a non-linear trend, confirming the results obtained in previous research. Therefore, for Chilean manufacturing companies, it is worth investing in the individual elements of working capital until the optimal size is reached, as the investment positively impacts profitability. After exceeding the optimal threshold, the ratio reverses, increasing the risks of financial difficulties.

Keywords: working capital, profitability, manufacturing companies, Chile, non-linear trend, financial difficulties.

INTRODUCTION

The management of working capital (WCM) has become increasingly important for companies of all sizes due to the various crises of a financial and non-financial nature that have occurred globally in recent decades. The short-term financial equilibrium can affect the medium and long-term financial management and economic stability, affecting the firm's ability to survive. In the context briefly outlined, the management policy of each component of working capital determines an impact on short-term financial flows, affecting - at the same time - the future economic-financial equilibrium.

The literature has extensively studied the issue of working capital management. However, scholars have focused mainly on companies in developed economies. Over the last decade, the literature has shifted the focus on companies in emerging economies. Therefore, studies on working capital management in SMEs in emerging economies deserve attention from researchers. Furthermore, the SMEs of these economies often represent the backbone of the country's economic and social development, making a significant contribution to employment and GDP.

In the context outlined, this research analyses the relationship between the determinants of working capital and profitability in the context of Chilean SMEs to enrich the literature on the subject and provide helpful

information to the managers of these companies. The paper is organised as follows. The second section develops the literature review. The third section illustrates the research methodology, while the next section highlights and analyses the results. Finally, the last section contains the concluding remarks.

1. LITERATURE REVIEW

The general business and financial literature investigating the relationship between working capital and business performance are extensive (Fazzari and Petersen, 1993; Deloof, 2003; Filbeck and Krueger, 2005; Gill et al., 2010; Bagchi and Khamrui, 2012; Sensini, 2020; Chalmers et al., 2020; Hernandez et al., 2021). The researchers focused their attention on different aspects in different economic contexts, depending on the research perspective sought. However, the prevailing literature has highlighted the need to focus attention on its determinants, namely liquidity, credits, inventories and debts (Chen et al., 2014; Sanchez and Sensini, 2017; Mannetta et al., 2013; Kumar and Sun, 2022).

The management of these variables affects the short-term financial equilibrium, also affecting the future survival prospects of the company.

In any case, the efficient and effective management of working capital requires that current assets content the company with sufficient cash flows to pay short-term debts, aiming to optimise the relationship between risk and profitability (Mannetta, 2014; Chalmers et al., 2020).

Any choice regarding any variable of working capital necessarily impacts all the others, influencing the financial and economic dimension of the company and, therefore, the risk of financial difficulties and, more generally, the business risk (Sen and Oruc, 2009; Alipour, 2011; Alvarez et al., 2021).

Increasing sales through a longer extension to customers can help increase turnover and profitability. However, the possible consequences of this expansionary policy must also be carefully considered. Extending customer collection times can cause economic tensions if actions are not taken to balance the extension of the entry financial cycle. Furthermore, the shift in sales collection times can lead to an increase in the level of risk due to possible financial difficulties for customers (Mannetta et al., 2013; Sensini, 2016; Diaz and Vazquez, 2019; Shan et al., 2019; Chalmers and Diaz, 2022; Kumar and Sun, 2022).

This reasoning can also be extended to the other components of working capital. For example, warehouse management policies, which represent the link between production and sales (Sensini, 2020), also significantly impact the company's financial flows. Consequently, the choice of greater or lesser supplies in specific periods and the stock management policy must be carefully considered.

Likewise, debt management deserves the same attention. The extension of the payment time of debts, if on the hand it can favour the availability of more significant financial resources in the short term; on the other hand, it can worsen relations with suppliers (Campos et al., 2014; Chalmers et al., 2014; Chen et al., 2014; Chalmers and Diaz, 2022).

Concerning each of the working capital variables mentioned, the literature has often found conflicting results. The company's size, the different economic contexts, and the different survey perspectives used from time to time are the cause of these divergences in the corporate and financial literature.

In this regard, scholars have suggested that negative, positive and non-linear relationships can emerge between the individual determinants of working capital and profitability.

In particular, some authors have suggested a negative relationship between the Cash Conversion Cycle (CCC) and profitability, measured by ROA and ROE, also finding a negative relationship between the CCC and the other determinants of working capital. (Wang, 2002; Nobanee et al., 2011; Tauringana and Afrifa, 2013; Ching et al., 2011; Mannetta and Zhang, 2014: Chalmers and Diaz, 2022).

Other studies have suggested a positive relationship between working capital management and corporate profitability (Gill et al., 2010; Sharma and Kumar, 2011).

Finally, other studies have highlighted a non-linear relationship between the determinants of working capital and profitability, suggesting identifying an optimal level of working capital (Diaz and Vazquez, 2019).

2. RESEARCH METHODOLOGY

To achieve our research objectives, we have selected a sample of manufacturing companies with registered offices in the metropolitan region of Santiago. We have chosen this region because it is the most representative of the economic and social dimensions of the country. The sample was drawn with a random sampling technique. Overall, 200 manufacturing companies were selected. The data was collected through a questionnaire to gather the financial information necessary to calculate the individual components of working capital. The survey refers to 5 years and covers the years from 2015 to 2019.

A total of 120 companies participated in the survey. This level of participation can be considered satisfactory.

Table 1 shows how we determined the individual variables under investigation.

Tab. 1 –Variables of interest

Dependent Variable		
Profitability	ROA	Net income/Average Total Assets
Independent Variables		
Inventory	INV	Log (Average ages of inventories x 365/Cost)
Account Receivables	AR	Log (AR x 365/Turnover)
Account Payables	AP	Log (AP x 365/Cost)
Cash Conversion Cycle	CCC	Log (INV + AR) - AP
Control Variables		
Current Ratio	CR	Total Current Assets/ Total Current Liabilities
Assets Turnover Ratio	ATR	Total Fixed Assets/Total Assets

We developed the research using two different models.

The first model (1) was developed to investigate the influence of every single element of working capital on profitability.

The model assumes the individual determinants as independent variables and profitability as a dependent variable, as highlighted below:

$$ROA_{i,t} = \beta_0 + \beta_1 INV_{i,t} + \alpha_1 CR_{i,t} + \alpha_2 ATR_{i,t} + \epsilon_{i,t} \quad (1a)$$

$$ROA_{i,t} = \beta_0 + \beta_1 AR_{i,t} + \alpha_1 CR_{i,t} + \alpha_2 ATR_{i,t} + \epsilon_{i,t} \quad (1b)$$

$$ROA_{i,t} = \beta_0 + \beta_1 AP_{i,t} + \alpha_1 CR_{i,t} + \alpha_2 ATR_{i,t} + \epsilon_{i,t} \quad (1c)$$

$$ROA_{i,t} = \beta_0 + \beta_1 CCC_{i,t} + \alpha_1 CR_{i,t} + \alpha_2 ATR_{i,t} + \epsilon_{i,t} \quad (1d)$$

The model just highlighted (1) allows us to identify only linear relationships between the individual elements of working capital and profitability. Therefore, we have developed a second model (2) to verify whether there are non-linear relationships between the variables under study.

The second model (2) uses a quadratic relationship and is highlighted below:

$$ROA_{i,t} = \beta_0 + \beta_1 INV_{i,t} + \beta_2 INV(2)_{i,t} + \alpha_1 CR_{i,t} + \alpha_2 ATR_{i,t} + \epsilon_{i,t} \quad (2a)$$

$$ROA_{i,t} = \beta_0 + \beta_1 AR_{i,t} + \beta_2 AR(2)_{i,t} + \alpha_1 CR_{i,t} + \alpha_2 ATR_{i,t} + \epsilon_{i,t} \quad (2b)$$

$$ROA_{i,t} = \beta_0 + \beta_1 AP_{i,t} + \beta_2 AP(2)_{i,t} + \alpha_1 CR_{i,t} + \alpha_2 ATR_{i,t} + \epsilon_{i,t} \quad (2c)$$

$$ROA_{i,t} = \beta_0 + \beta_1 CCC_{i,t} + \beta_2 CCC(2)_{i,t} + \alpha_1 CR_{i,t} + \alpha_2 ATR_{i,t} + \epsilon_{i,t} \quad (2d)$$

The analysis was developed with the generalised least squares method. We have chosen this set because this method gives more reliable results.

Table 2 shows the results derived from this method.

Table 2 – Descriptive statistics

Variables	Mean	Std. Dev.	Min	Max
ROA	0.063	0.079	-0.194	0.384
INV	4.175	1.876	-4.437	6.163
AR	4.356	1.212	1.243	7.571
AP	3.436	1.131	-3.918	5.918
CCC	4.987	1.154	-3.363	7.633
CR	2.108	1.901	0.345	14.845
ATR	0.211	0.223	0.001	0.959

Next, we developed
evident from table 3,
problems; therefore, the results are reliable.

Table 3 – Correlation matrix

	ROA	INV	AR	AP	CCC	CR	ATR
ROA	1						
INV	-0.231	1					
AR	-0.310	0.235	1				
AP	-0.291	0.291	0.475	1			
CR	0.291	-0,121	-0.041	-0.027	0.027	1	
ATR	0.049	-0.257	-0.291	-0.012	0.031	-0.141	1

3. RESEARCH RESULTS AND DISCUSSION

After verifying the results of the descriptive statistics and their reliability, in this section, we first developed the first regression model 1.

The results of the first regression model are highlighted in Table 4.

Table 4 – Model 1

Variables	1a	1b	1c	1d
INV	-0.00459***	-	-	-
AR	-	-0.0194***	-	-
AP	-	-	-0.0919***	-
CCC	-	-	-	-0.0136***
CR	0.00155***	0.00185***	0.00009	0.00217***
ATR	0.00000	-0.0218***	0.0007	0.0221***
C	0.0343**	0.0843***	0.0431***	0.0618***

Significance levels: * < 0.05; **p < 0.01; ***p < 0.001.

The results showed that the individual determinants and working capital have a negative and significant impact (1%) on the profitability of companies. In this regard, the Cash Conversion Cycle suggests that companies that manage to reduce working capital management times perform better than other companies. These results are consistent with those obtained in previous studies (Wang, 2002; Dang and Tran, 2019).

In line with the chosen research methodology, we subsequently developed model 2 to verify the presence of any non-linear relationships between the elements of working capital and the performance of companies. The results of the first regression model are highlighted in Table 5.

Table 5 – Model 2

Variables	2a	2b	2c	2d
INV	0.00116**	-	-	-
INV(2)	-0.00693***	-	-	-
AR	-	0.0137***	-	-
AR (2)	-	-0.0371***	-	-
AP	-	-	0.00583***	-
AP (2)	-	-	-0.00251***	-
CCC	-	-	-	0.0119***
CCC(2)	-	-	-	-0.00289***
CR	0.00169***	0.00187***	-0.00105**	0.00229***
ATR	-0.00579	-0.0235***	-0.00541	-0.0267***
C	0.0231	0.0122	0.0251	-0.00493

Significance levels: * < 0.05; **p < 0.01; ***p < 0.001.

The quadratic variables of the model show a non-linear relationship between the individual components of working capital and profitability. This circumstance indicates that an investment in working capital produces a positive effect until the optimal level is reached, which corresponds to the curvature point evaluated at $-\beta 1 / 2\beta 2$. After exceeding this level, the investment in working capital produces an opposite effect, negatively affecting the performance of the firm.

Therefore, the results suggest that expansionary policies produce positive effects until working capital reaches its optimal size. After this threshold, investments in current assets negatively affect company performance, leading to an increase in costs and greater sensitivity to risk. (Peterson and Rajan, 1997; Emery, 1984; Kim & Chung, 1990; Amendola et al., 2020).

4. CONCLUDING REMARKS

This paper aimed to investigate the relationships between working capital, its components and the profitability of companies, taking as a study reference the business context of an emerging economy, such as the Chilean one.

To carry out the survey, we selected a sample of manufacturing companies from the metropolitan region of Santiago, the liveliest area of the country, from both an economic and social point of view.

The data covered five years to allow a sufficiently significant observation time horizon. We used the generalised least squares method to develop the analysis. This method has the advantage of obtaining more reliable results than other methodologies.

The empirical results suggest that the relationship between the single elements of working capital and firms' profitability presents a non-linear trend, confirming the results obtained in previous research.

Therefore, it is worthwhile for Chilean manufacturing companies to invest in the individual elements of working capital until the optimal size is reached, as the investment positively affects profitability. After exceeding the optimal threshold, the relationship is reversed, leading to an increase in the risks of financial difficulties.

The results of this research contribute first to enriching the existing literature, broadening the view on the companies of an emerging economy that is still little studied.

Furthermore, the results can provide helpful food for thought for business managers, helping guide their management choices.

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