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Asst. Prof. Adem ÖZBEK
https://orcid.org/0000-0001-6599-6337
Gümüşhane University, Vocational School of Social Sciences, Management and Organization, Gümüşhane / TÜRKEY

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THE IMPACT OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY: AN ANALYSIS ON COMPANIES IN THE BIST WHOLESALE AND RETAIL SECTOR

ÇALIŞMA SERMAYESİ YÖNETİMİNİN KARLILIK ÜZERİNDEKİ ETKİSİ: BİST TOPTAN VE PERAKENDE SEKTÖRÜNDE YER ALAN FİRMALAR ÜZERİNE BİR UYGULAMA

ÖZET

Three crucial fields of activity such as production, sales, and collection are important determinants of the economic lives of companies. Working capital management ensures that these activities are conducted in a short period at the lowest cost incurred by the company. Particularly, the costs incurred due to time-based, inventory, and cash assets adversely affect the profitability levels of companies. In the research study, the financial information of 21 wholesale and retail companies trading in Borsa Istanbul over the period 2017-2021 was analyzed employing the panel data method. The information obtained from the financial statements of the companies was assessed within the scope of working capital management and profitability by utilizing the ratios such as inventory turnover, accounts receivables turnover, accounts payables turnover, cash conversion cycle, leverage ratio, and current ratio. The results revealed that a significant relationship exists between the return on assets of the companies and the inventory turnover, cash conversion cycle, accounts payable turnover, and leverage factors, whereas between the return on equity of the companies and inventory turnover, accounts receivable turnover, and cash conversion cycle.
Keywords: Working Capital, BIST, Panel Data, Return on Equity, Return on Assets.

ABSTRACT

Üretim, satış ve tahsilât gibi üç önemli faaliyet alanı firmaların ekonomik ömürlerinin önemli belirleyicileridir. Çalışma sermayesi yönetimi bu faaliyetlerin firma açısından kısa zamanda en düşük maliyetle gerçekleşmesini sağlamaktadır. Özellikle zamana dayalı, stok ve nakit varlıklar için katlanılan maliyetler firmaların karlılık seviyelerini olumsuz etkilemektedir. Araştırmada, Borsa İstanbul'da faaliyette bulunan 21 toptan ve perakende firmanın 2017-2021 dönemlerini kapsayan finansal bilgileri panel veri yöntemi ile analiz edilmiştir. Firmaların finansal tablolarında yer alan bilgiler, stok devir hızı, alacak devir hızı, borç ödeme hızı, nakde dönüşme süresi, kaldıraç ve cari oran gibi rasyoların yardımı ile çalışma sermayesi yönetimi ve karlılık kapsamında değerlendirilmiştir. Elde edilen sonuçlar, firmaların varlık karlıkları ile stok devir hızı, nakde dönüşme süresi, borç ödeme hızı ve kaldıraç faktörleri arasında, öz sermaye karlılıkları ile stok devir hızı, alacak devir hızı ve nakde dönüşme süreleri arasında anlamlı bir ilişki olduğunu göstermektedir.
Anahtar Kelimeler: Çalışma Sermayesi, BİST, Panel Veri, Öz Sermaye Karlılığı, Varlık Karlılığı.

1. INTRODUCTION

Working capital management (WCM) is an important decision-making phase with which companies deal within the scope of financial management and firm value. Working capital requirements are linked to earning and spending processes (Pass and Pike, 1987). It can be expressed as short-term process management that involves the activities of companies on a timely basis. All activities within the cycle of production, sales, and collection are included in this process. The basic subjects of working capital consist of inventory management in production and sales processes, receivables management in sales and collection processes, and debt and cash management for the entire activities. Working capital is essential in the financial decision-making processes of companies as it is part of the investment in the assets that require appropriate funding investment.

WCM includes short-term investment and financing. Successful execution of short-term investment decisions of companies allows them to develop their long-term capabilities. Besides, it contributes to the financing needs of the companies and allows the accurate estimation of future cash flows. The ability of companies to maintain their activities even longer depends on their success in WCM (Zariyawati, Annuar, Taufiq & Rahim, 2009: 47). The amount transferred to working capital is usually high in proportion to the utilized total assets, so it is vital to ensure their effective use (Padachi, 2006).

On the basis of working capital, there are two important components in terms of liquidity. These components are expressed as current assets and current liabilities (Pass and Pike, 1987). Although inventories, receivables, and cash are included in the management of current assets; the short-term liabilities consist of short-term credit sales, bank loans, and other short-term loans. In particular, current assets are considered a process within the scope of working capital. Inventories are expressed in terms of the period until product supply and production, and the period until sales and collection of receivables. These two processes constitute the duration of operation of the companies. These processes should be as low in WCM as possible when associated with firm profitability. Because the excess time spent both on supply and production and for the collection of receivables would lead to an increase in opportunity and inventory costs.

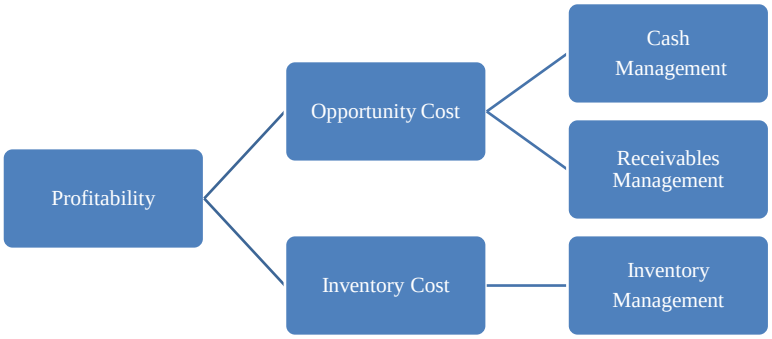

Figure 1. Management Cycle of the Working Capital Factors

In WCM, receivables arising from credit sales are assessed in the cash group. Opportunity costs, which arise due to the duration of the receivables in the market, are also valid for the durations when cash sits idle. Nonetheless, in inventory management, which is formed according to order, supply, and production processes, inventory costs are another cost group encountered by companies. Both opportunity and inventory costs are crucial determinants of firm profitability within the context of WCM.

The retail and wholesale sector in Turkey is quite an important sector in terms of capacity and size. There are a total of 3.1 million companies in Turkey, and 723 thousand of them operate in the retail sector. The total revenue of the sector is 710 Billion TL and such turnover corresponds to 11.5% of the turnover in all sectors. The share of retail services in the GDP (of approximately 3.1 trillion TL) is 368 billion TL, at the level of 12% (www.ticaret.gov.tr). WCM is especially important for wholesale and retail companies, whose assets consist of mostly current assets. If WCM is not given due importance in these companies, they are likely to fail and go bankrupt (Kargar and Bluementhal, 1994).

Working capital is an important factor for companies to maintain their liquidity, survival, solvency, and profitability (Mukhopadhyay, 2004). All individual components of working capital, including cash, securities, receivables, and inventory management, play vital roles in firms' performances (Raheman, Afza, Qayyum, & Bodla, 2010: 152). WCM is often associated with two benefits; firstly in

terms of the direct impact of WCM on firm liquidity (Kim, Mauer & Sherman, 1998), and secondly in terms of the ease of obtaining the short-term effects of capital management on liquidity (Richards and Laughlin, 1980). Firms' WCM abilities would not only increase profits but also ease growth. Concerning the growth of firms, Higgins (1977) introduced the concept of sustainable growth rate, which indicates the maximum sales growth of firms without having to change their funding decisions. Sustainable growth rate refers to the maximum growth rate of firms relying merely on internal financing (Nastiti, Atahau & Supramono, 2019:61). Jana (2018), in his study conducted in India, stated that the working capital of firms did not only involve profitability but also significantly affected their profitability.

In the study, the impacts of working capital management practices, which are significant determinants of costs, on the return on assets and return on equity of companies are to be investigated. To this end, two models are established that would explain the relationship levels of return on assets and return on equity (profitability) with inventory turnover, accounts receivable turnover, accounts payable turnover, cash conversion cycle, financial leverage, and current ratios.

2. LITERATURE REVIEW

Zariyawati et al. (2009), in their study investigating the relationship between working capital management and firm profitability, suggested that the cash conversion cycle should have been reduced in order to increase the wealth of the shareholders. Lyngstadaas and Berg (2016), in their study on Norwegian SMEs, stated that efficient working capital management would have generated improved profitability, whereas more aggressive WCM policies, in general, enhanced the firm profitability. Kieschnick, Laplante & Moussawi (2006), in their study conducted on companies operating in the USA, reported that WCM inefficiency was positively related to firm size and unrelated to industrial concentration. Wang (2002) stated in his study that aggressive liquidity management improved firm performance and, in general, was associated with higher corporate values.

Singh and Kumar (2014) analyzed 126 research articles conducted on WCM and concluded that the firm profitability might have been increased by reducing the amount invested in working capital. Raheman et al. (2010), in their study on the manufacturing sector, stated that WCM should have been the concern of all manufacturing sector companies and should have assumed due importance. Besides, the authors reported in their study that companies operating in the manufacturing sector should have, in general, reviewed their collection and payment policies.

Shin and Soenen (1998) utilized the ratios such as cash conversion cycle, net operating profit, gross operating profit, and return on equity in order to assess the WCM. In the results of the research, they found the existence of a negative relationship between the cash conversion cycle and profitability rates and asserted that WCM had a great impact on the firm profitability. Alipour (2011) stated in his study that there was a significant relationship between WCM and profitability, whereas a negative relationship between cash conversion cycle and gross operating profit. Nastiti et al. (2019) analyzed the relationship between WCM, firm profitability, and sustainable growth, and explained that WCM was significantly related to firm profitability and sustainable growth.

Bogan, Johnson & Mhlanga (2007), in their study conducted on 300 microfinance institutions, emphasized that the capital structure and management of financial instruments were the determining factors of financial sustainability, and such sustainability was achieved through a life cycle of institutional development. Anton & Nucu (2020), in their study where they measured the working capital and profitability relationship for a sample of 719 companies over the period 2007-2016, concluded that at a low working capital level, increased sales and early discounts positively affected the firm profitability. Kusuma and Bachtiar (2018) measured WCM by using the cash conversion cycle, inventory turnover, accounts receivable turnover, current ratio, and working capital turnover ratio and stated that those ratios had a significant impact on firm performance.

Sensini & Vazquez (2021), in their study in which they investigated the effect of working capital management policies on the profitability of Argentine industrial enterprises, they stated that giving longer terms to customers would not affect profitability. Alrabadi, Al Salamat & Hatamleh (2021), regarding the long-term sustainability of SME's in Jordan, reported that working capital financing policy had positive effects on sales growth and firm size. Chalmers and Zielinski (2022) investigated the effects of working capital management policies on business performance. In their study, they found that the working capital policies of the companies operating in the manufacturing sector affect

the profitability of the companies. Alvarez, Xavi & Wilner (2022) stated that the effective management of working capital and liquidity is affected by the sectors in which companies belong, and therefore managers should consider the differences between sectors when designing firms' working capital management policies.

3. DATA and METHODOLOGY

3.1. Aim and Scope of the Study

The aim of this study is to investigate the relationships between the profitability of the companies and the cash conversion cycle (regarding inventory, receivables, and debt payments), the current ratio (reflecting the liquidity situation), and the financial leverage status of the companies. In the study, 21 companies that maintained their activities uninterruptedly over the period 2017-2021, traded in Borsa Istanbul, and engaged in wholesale and retail trade are included in the analysis. There are a total of 23 companies trading in the Borsa Istanbul wholesale and retail trade sector, and 2 companies are not included in the study since their activities have not been uninterrupted throughout the relevant periods. The financial data regarding the companies are obtained from the corporate websites of the companies and the Public Disclosure Platform (PDP). Stata 14.2 and E-Views 12 software are utilized to test the panel dataset and models developed using the obtained data.

3.2. Research Model

In the research model, there are two dependent variables, namely, return on assets (ROA) and return on equity (ROE), and five independent variables, namely inventory turnover, accounts receivables turnover, accounts payables turnover, financial leverage, and current ratio.

Table 1. Summary of the variables included in the research model

Dependent Variables	**Symbols**	**Formulas**
Return on Assets	ROA	Net Income / Total Assets
Return on Equity	ROE	Net Income / Equity
Independent Variables		
Inventory Turnover Rate	ITR	Cost of Goods Sold / Average Inventory
Accounts Receivable Turnover Rate	ART	Net Sales / Average Accounts Receivable
Accounts Payable Turnover Rate	APT	Cost of Goods Sold / Average Accounts Payable
Leverage Ratio	LEV	Total Debt / Total Assets
Current Ratio	CUR	Current Assets / Current Liabilities
Cash Conversion Cycle	CCC	ITR+ART-APT

In the equation for the first model, ROAi,t denotes the ratio of net profits of wholesale and retail trade companies traded in BIST to total assets, c represents the constant variable, α stands for the slope coefficients of the variables, ε denotes the error term, and the indices of i and t denote the values of each cross-section (company and time series (period) of the variables.

ROA i,t = c + a1 (ITR)i,t + a2 (ART)i,t + a3 (APT)i,t + a4 (LEV)i,t + a5 (CUR)i,t + a6 (CCC)i,t + $\varepsilon i,t$

In the equation for the second model, ROEi,t denotes the ratio of net profits of wholesale and retail trade companies traded in BIST to equity, c represents the constant variable, α stands for the slope coefficients of the variables, ε denotes the error term, and the indices of i and t denote the values of each cross-section (company and time series (period) of the variables.

ROEi,t = c + a1 (ITR)i,t + a2 (ART)i,t + a3 (APT)i,t + a4 (LEV)i,t + a5 (CUR)i,t + a6 (CCC)i,t + $\varepsilon i,t$

Table 2. Companies Included in the Research Study

Companies	BIST Codes
Arzum Elektrikli Ev Aletleri Sanayi ve Ticaret A.Ş.	ARZUM
Bim Birleşik Mağazalar A.Ş.	BIMAS
Bizim Toptan Satış Mağazaları A.Ş.	BIZIM
Carrefoursa Carrefour Sabancı Ticaret Merkezi A.Ş.	CRFSA
Casa Emtia Petrol Kimyevi ve Türevleri Sanayi Ticaret A.Ş.	CASA
Doğuş Otomotiv Servis ve Ticaret A.Ş.	DOAS
Gen İlaç ve Sağlık Ürünleri Sanayi ve Ticaret A.Ş.	GENIL
İntema İnşaat ve Tesisat Malzemeleri Yatırım ve Pazarlama A.Ş.	INTEM
Mavi Giyim Sanayi ve Ticaret A.Ş.	MAVI
Mepet Metro Petrol ve Tesisleri Sanayi Ticaret A.Ş.	MEPET
Migros Ticaret A.Ş.	MGROS
Milpa Ticari ve Sınai Ürünler Pazarlama Sanayi ve Ticaret A.Ş.	MIPAZ
Pergamon Status Dış Ticaret A.Ş.	PSDTC
Sanko Pazarlama İthalat İhracat A.Ş.	SANKO
Selçuk Ecza Deposu Ticaret ve Sanayi A.Ş.	SELEC
Suwen Tekstil Sanayi Pazarlama A.Ş.	SUWEN
Şok Marketler Ticaret A.Ş.	SOKM
Teknosa İç ve Dış Ticaret A.Ş.	TKNSA
Tgs Dış Ticaret A.Ş.	TGSAS
Uzertaş Boya Sanayi Ticaret Ve Yatırım A.Ş	UZERB
Vakko Tekstil ve Hazır Giyim Sanayi İşletmeleri A.Ş.	VAKKO

There are a total of 23 companies in the wholesale and retail trade sector trading in the BIST. Ersan Alışveriş Hizmetleri ve Gıda Sanayi Ticaret AŞ (KIMMR) and Gimat Mağazacılık Sanayi ve Ticaret AŞ (GMTAS) are excluded from the analysis due to the lack of periodic data in their financial statements over the years 2017-2021.

4. FINDINGS

In this part, the analysis of the data obtained from the financial statements of the companies employing the panel data analysis method is tried to be explained in compliance with the developed models. In the regression analysis, there are many assumptions regarding the model, such as multicollinearity, heteroscedasticity, linearity, and autocorrelation (Jason & Elaine, 2002). If one or more of these assumptions are violated, the model is no longer reliable and is not accepted in estimating population parameters (Daoud, 2017: 1). Multicollinearity occurs when two or more independent variables in the regression model are correlated. The Variance Inflation Factor (VIF) test is performed to determine the existence of the multicollinearity problem among the independent variables.

Table 3. Descriptive Statistics

Variables	Number of Observation	Mean	Std. Deviation	Min	Max
ROA	105	0.0511	8.5411	-0.2121	1.01
ROE	105	0.6413	2.0997	0.0107	17.811
ITR	105	22.3251	12.7802	1.15	55.83
ART	105	14.6121	9.6384	0.23	36.18
APT	105	6.4949	6.2072	0.28	41.85
CCC	105	30.4423	16.8808	-35	73.04
LEV	105	0.7318	0.2800	0.09	1.83
CUR	105	1.2913	1.6974	0.02	14.67

In Table 3, it is seen that the mean value of the ROA of the companies included in the analysis over the period 2017-2021 is approximately 6%, whereas the ROE is about 65%. The mean values of inventory turnover, account receivable turnover, account payable turnover, and cash conversion cycle of the companies are calculated as 22, 14, 6, and 30, respectively. On average, the leverage ratio is 73%; whereas the current ratio is 1.29.

Table 4. Correlation Test Results

	ROA	ROE	ITR	ART	APT	CCC	CUR	LEV
ROA	1							
ROE	-0.1782	1						
ITR	0.2024	-0.0813	1					
ART	0.1737	-0.1860	-0.2108	1				
APT	0.1548	-0.1281	-0.3821	0.1545	1			
CCC	0.1954	-0.1207	0.7772	0.3546	-0.5687	1		
CUR	0.2524	-0.0806	-0.1768	-0.0607	0.4671	-0.3403	1	
LEV	-0.4919	0.2068	0.1660	-0.2042	-0.3855	0.1508	-0.4477	1

In order to determine whether or not a correlation exists between the variables in the model, the correlation test is performed. The fact that the correlation coefficient between the variables exceeds 0.90 leads to a multicollinearity problem (Tabachnick & Fidell, 2001). Table 4 indicates that the highest correlation between CCC and ITR is found at 0.777. Positive correlations are found between ROA and ITR, ART, APT, CCC, and CUR; whereas low negative correlations are calculated between ROA and ITR, ART, APT, NDS, and CUR.

Table 5. VIF Test Results of the Variables

Variables	VIF	1/VIF
ART	1.53	0.655055
ITR	5.50	0.181924
APT	2.22	0.450488
CCC	2.10	0.475612
CUR	1.51	0.663740
LEV	1.39	0.721693
Mean VIF	2.38	

Another multicollinearity problem criteria involve the VIF values. High VIF values reduce the reliability of the model results. The critical value for the VIF values is 10. The VIF values of 10 and above indicate that a high degree of multicollinearity occurs between the variables (Myers, 1990; Baum, 2006; Field, 2009; Yan & Su, 2009). According to the analysis results presented in Table 2, it is seen that the VIF values range between 1.39-5.50, and no multicollinearity problem occurs between the model variables.

Table 6. Breusch & Pagan LM Test Results

	Model I		Model II	
Test	**Statistic**	**Probability**	**Statistic**	**Probability**
Breush-Pagan LM	253.0398	0.0226**	246.6205	0.0423**

** coefficient is significant at the 0.05 significance level.

To test the suitability of the pooled LCC model versus Breusch-Pagan's random-effects model, they developed the Lagrange Multiplier (LM) test based on the evidence of the pooled LCC model (Uluyol and Türk, 2013). This test, which provides a choice between random effects and the pooled model, indicates that if the variance of the unit effects is zero, the random effect can be solved by employing the pooled model (Meder Çakır & Küçükkaplan, 2012). According to the established hypotheses; H0: Var (u) = 0, H1: Var (u) ≠ 0, the H0 hypothesis is rejected since the test probability results (0.0226) and (0.0423) shown in Table 5 are lower than the margin of error (0.05) determined in the study. In other words, the variance of the unit effects is not equal to zero and indicates the presence of the panel effect.

Table 7. Hausman Test Results

	Model I		Model II	
Test	**Statistic**	**Probability**	**Statistic**	**Probability**
Hausman	1.2486	0.7414	0.7325	0.8655

According to the Hausman test results presented in Table 6, p probability values are calculated higher than 0.05. According to these results, the random-effects model is found suitable for both the ROA and ROE over the period 2017-2021.

Table 8. Panel Regression Results for the Models

Model 1 (ROA)			**Model 2 (ROE)**		
Variables	**Coefficients**	**Probability Values**	**Variables**	**Coefficients**	**Probability Values**
ITR	0.0013781	**0.017**	ITR	0.0048274	**0.000**
ART	-0.0943447	0.289	ART	-0.0076125	**0.036**
APT	0.2838237	**0.000**	APT	-0.0681555	0.160
CCC	0.2292966	**0.000**	CCC	-0.0307777	**0.047**
CUR	0.4959683	0.323	CUR	-0.0022992	0.217
LEV	-13.97623	**0.000**	LEV	1.187774	0.162
R^2	0.3523		**R^2**	0.1823	
Probability Value	0.0000		**Probability Value**	0.0047	

Table 8 indicates the regression analysis results of the models related to the research study. It is seen that the explanatory power of the significant and independent variables of both models for the dependent variable is R2: 0.3523 in Model 1 and R2: 0.1823 in Model 2. Since the probability values

of the models are p = 0.000 < 0.05 in M1 and p = 0.0047 < 0.05 in M2, it can be claimed that the models are significant at the 95% confidence level. Upon examining the explanatory variables, it is seen that a significant relationship exists between return on assets and inventory turnover, cash conversion cycle accounts payable turnover and leverage factors in Model 1. In Model 2, it is seen that a significant relationship exists between return on equity and inventory turnover, accounts receivable turnover, and cash conversion cycle. It is seen that no significant relationships exist between return on assets and accounts receivable turnover and current ratio in Model 1; whereas between return on equity and accounts payable turnover, current ratio, and leverage factor in Model 2.

5. CONCLUSION

This article investigated the impacts of working capital management on the return on assets and return on equity of wholesale and retail companies in Borsa Istanbul, Turkey, using the main topics in the working capital literature. The data was obtained from the information in the financial statements of 21 companies over the period 2017-2021. The random-effects regression model was employed to test the relationships in the models of the study. The tests to explain the relationship estimations between variables indicated that WCM was effective on the firms' profitability. In the research study, independent variables such as inventory turnover, accounts receivable turnover, accounts payable turnover, cash conversion cycle, leverage, and current ratio, were thought to be associated with two dependent variables, namely, return on assets and return on equity, were analyzed by employing the panel data method.

The lines of business of the companies had significant impacts on WCM decisions. Inventory management was of vital importance for the companies included in the study. Inventory and receivables management were crucial determinants of the duration of the firm's activities. Inventory costs were among the most important costs that affect the firm profitability. Upon considering the analysis results, it was seen that successful inventory management had positive impacts on both returns on assets and return on equity. Nonetheless, it was seen that the cash conversion cycles, accounts receivable turnover, and financial leverage ratios, which indicated the ability to use debt, were also related to and effective on the return on assets. Besides inventory management, it was also necessary to mention the variables of receivables management and cash conversion cycle, which affect the return on equity. In both research models, it was seen that the current ratio structures that reflected the liquidity status of the companies did not have an impact on the profitability. As a result, it was seen that the working capital practices shaped around the production, sales, and revenue cycle of the companies were crucial in support of the studies expressed in the literature.

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