WORKING CAPITAL MANAGEMENT COMPARATIVE ANALYSIS IN TERM OF SECTORIAL GROUP

SEKTÖREL GRUP AÇISINDAN İŞLETME SERMAYESİ YÖNETİMİ KARŞILAŞTIRMALI ANALİZ

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ABSTRACT
This study made a comparative analysis on working capital management in term of sectorial groups for a sample of 29 ISE listed companies (production, retails and technology sectors) during 2008-2016. The results from one way ANOVA analysis found that the models are significant in all tests on this study. The model which current ratio is dependent variable represent that, the mean value of current ratio on retail sector is the lowest which is not expected. On other ANOVA tables production, retailars and technology sectors have the lowest debt ratio, interest coverage ratio and CCC period respectively. The final ANVOA test indicate that, manufacturing sector has the highest ROA and ROE compare to other sectors.

Key words: Cash conversion cycle, Production sector, Retail sector, Techonology sector and Working capital management.

JEL Classification Codes : G2, G3, G31, G32

ÖZET
Bu çalışmada, 2008-2016 yılları arasında 29 İMKB'de işlem gören şirketlerin (teknoloji, üretim ve perakende) sektörel gruplar açısından işletme sermayesi yönetimi üzerine karşılaştırmalı bir analiz yapılması amaçlanmıştır. Tek yönlü ANOVA analizinin sonuçları, bu çalışmanın tüm testlerinde modellerin anlamlı olduğunu göstermiştir. Cari oranının bağımlı değişken olduğu model, perakende sektöründeki cari oranın ortalama değerinin beklenmeyen en düşük değer olduğunu göstermektedir. Diğer ANOVA tablolarında imalat, teknoloji ve perakende sektörleri sırasıyla en düşük borç oranına, faiz karşılama oranına ve nakit dönüşüm dönemine sahiptir. Ve son ANOVA testine göre imalat sektörünün diğer sektörlere kıyasla en yüksek aktif karlılığı ve öz sermaye karlılığına sahip olduğunu göstermektedir.

Anahtar kelimeler: Nakit dönüşüm süresi, İmalat sektörü, Perakende sektörü, Teknoloji sektörü ve İşletme sermayesi yönetimi.

JEL Sınıflandırma Kodları: G2, G3, G31, G32

Introduction

Corporate financial management mainly focus, on three core areas of finance; capital structure, capital budgeting and working capital management (WCM). Where, capital budgeting is dealing that how firms should allocates their resources, capital structure concerning about that how business financing their investment and what would be the combination of debt- equity ratio of firms' capital structure. Both mentioned areas, dealing with long term capital financing, source and use of long term finance had been the core concentration of financial management rather than working capital management (WCM) which is an important element of corporate financial management theory related to management of short time financing and corporates' investment decision.

Working capital contains current assets and current liabilities. Current assets are used for daily business operation which it's maturity time is short normally one accounting year (Sharma and Kumar, 2011). Due to high proportion of working capital in the businesses, the appropriate management of working capital is challenging in modern financial management. Both liquid assets and short term liabilities are used in firms at same time. Liquid assets and short term liabilities are flowing and intertwined to the entire business operation like; electric in current (Mengesha, 2014, p. 1). The primary objective of WCM

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is proper management of WC and also aims to maintain optimal level of WC components (account receivables, account payables, cash and inventories) (Gill, Biger & Mathur 2010).

This paper made a comparative analysis on working capital management (WCM) in term of sectorial groups for a sample of 29 Istanbul Stock Exchange (ISE) listed companies during 2008-2016. The sample consist of three sectors; technology, manufacturing and retailers. Manufacturing sector had included to the sample of the study because on this sector more than 50% of its total assets are current assets and current liabilities. Technology sector had included to the sample of the study due to technological revolution, economic activities are digitalized, the digitalized economic created more business opportunities all over the world, specially for small business and entrepreneurs in developing economies which connected to the world market. The retail sector had taken to the sample of the study because doing business on this sector is highly depends on current assets and current liabilities.

Literature review and hypothesis development

Categorizing companies based on its related industries is one of the main factor to analyze the WCM. Companies which are operating in different industries their nature, operation procedure, accounting polices, financial structure and other rule and regulations are different from each others. By classifying companies based on their related industries would come to know the differences on their practices of WCM and its related components (Rimo & Panbunyuen, 2010, p. 32).

Yazdanfar and Öhman (2014) documented on a study that, CCC have significant impact on firms' profitability. The indicators like; size, age and industry group of the firms have also impact on companies' profitability. The researchers added that, manager could maximize firms' profitability by proper management of working capital. Beyazgül and Karadeniz (2017) have made a comparative analyze on CCC of small, medium and large firms of Turkish manufacturing companies during 1999 to 2014. Based on the result of the empirical analysis, the time lag of CCC is statistically different among small, medium and large firms of manufacturing related companies. As the scale of companies become smaller the CCC duration is getting longer. The researchers also added that, CCC duration is strongly correlated with stock turn over period and account receivable period. Jose, Lancaster and Stevens (1996) documented on an empirical study that, different industries have different effect on the variability of CCC, because the product type and markets of the businesses are different. This study which is conducted based on industries influences have taken seven categories of business (natural resources, construction, manufacturing, retailers/wholesalers, financial services and professional services) as the sample for the study. The result from the study indicate that, construction businesses have the highest and service business have the lowest average period of CCC. Agarwal and Varma, (2013), made a research based on several industries, and from the statistical analysis come to the conclusion that, telecommunication industry has the highest average days working capital (3155 days) during 1998-2001, following by computer hardware industry (2481 days). And for the same period tourism industry has the lowest days of working capital (-272 days).

Rimo and Panbunyuen (2010, p. 56) on an empirical research based on eight sectors (telecommunication, IT, consumer discretionary, consumer staples, energy related firms and materials) had found that, there are highly significant positive relation between cash conversion cycle (CCC) and four sectors namely: Material sector, Industrials, Health care and Information Technology. And the remaining sectors have not significant relation with CCC.

Wang and Yung (2002) made a study based on Japanese and Taiwanese companies had found that, food industry have the highest and service industry have the lowest CCC duration on Japan related firms, while construction industry has the highest and transportation industry has the lowest CCC duration on Taiwan related companies. Uyar (2009) documented on an empirical research on relationship between CCC and firms' profitability based on 166 companies related to different sectors of (ISE) listed firms on 2007. The result from statistical analysis had found that, retails /wholesaler industry have shorter CCC period compare to manufacturing industry. With the reference of above empirical research the related null hypothesis could be formulated as follows:

H_0: *The differentiation between sectorial group in term of CCC are not statistically significant.*

H_0: *In term of operating cycle the differentiation between sectorial groups are not statistically significant.*

Çakir and Kaplan (2012) indicated on a study that, stock turn over and asset turn over have significantly positive relation with firms' profitability. Keskin and Gökalp (2016) presented on a study that, account receivable duration and current ratio both have highly significant negative effect on firms' profitability. Şen (2009) made un empirical study on relationship between efficiency level of WCM and return on assets (ROA) based on 49 manufacturing firms of Istanbul Stock Exchange (ISE) listed companies during 1993-2007. The researchers had come to conclusion that, current ratio, account receivable period and stock turn over period are negatively associated with return on assets (ROA). Şamiloğlu and Demirgüneş (2008) had documented on a study that, firms' profitability had negatively affected by account receivable period and inventory duration. Lazaridis and Tryfonidis (2006) found that, keeping an optimal level of CCC components (account receivable, account payables and inventory periods) lead firms to profit maximization, the study is conducted based on different industries on Athens Stock Exchange listed companies during 2001-2004. Dursun and Ayrıçay (2012) made an empirical research based on 120 firms from production and trade sectors of Istanbul Stock Exchange listed companies during 1996-2005. From the study researchers had concluded that, in order to increase the firms' gross profit, needs to minimize the stock turn over, account receivable period, prolonging the account payable period and the management required to meet its obligation on or before the maturity time. Rimo and Panbunyuen (2010, p. 51) made an empirical research based on eight sectors (telecommunication, IT, consumer discretionary, consumer staples, energy related firms and materials), the result from regression analysis represents that, consumer staples sector have the highest inventory period (107.13 days) and telecommunication has the lowest inventory period (12.67 days). The information technology has the longest account receivable period and the energy sector has shortest account receivable/payable period and the account payable period on telecommunication and the health care sectors are high. They also had found that, three sectors (materials, industrials and health care) are positively associated with inventory period. The researchers had suggested that production sector need to maintain high inventory volume compare to other industries. Jose, Lancaster and Stevens (1996) on their studies had found the same result that, the relationship of CCC and its components are affected by industry factors and also it have impact on profitability, capital intensity, operation process and distribution channel of businesses. Shin and Soenen (1998) made a study to analyze the effect of industry on WCM. The study targeted eight industries. By applying the regression analysis found that, agriculture industry has the shortest account receivable period, while communication, oil and gas extraction industries due to low level of inventory have the shortest net trade cycle period. Demirel, Başci and Karaca (2014) conducted a study to find the relationship between WCM and performance indicators based on 5 sectors namely; real estate investment, manufacturing, technology, mine industry and commercial businesses during 1998 to 2010. The result form the study indicates that, the elements of WC (inventories, stocks, account receivables and account payables) are different among all sectors. Added that account receivable and stock strategies is highly flexible on real estate sector compare to others. So based on finding of above mentioned empirical studies the related hypothesis could formulated as follows:

H_0: *The differentiation between sectorial groups in term of account receivable period are not statistically significant.*

H_0: The differentiation between sectorial groups in term of account payable period are not statistically significant.

H_0: The differentiation between sectorial groups in term of stock turn over are not statistically significant.

H_0: In term of inventory period the differentiation between sectorial groups are not statistically significant.

Moss and Stine (1993) provided an evidence that, higher level of current ratio means that companies' current assets have excess to current liabilities which represents companies' solvency and company can finance their business operation and able to manage their long CCC period. Çakir and Kaplan (2012)

indicated on a study that, current and leverage ratios have negative relation with firms' profitability, on the other hand acid-test ratio, stock turn over and asset turn over have significantly positive relation with firms' profitability. Uluyol and Türk (2013) made a study on impact of financial ratios to the firms value based on 56 production firms of Istanbul Stock Exchange (ISE) listed companies during 2004 to 2010. Equity ratio, current ratio, stock turnover, profit margin, earning per share ratios are considered as independent variables and firms' value had taken as dependent variable. The result of study concluded that among dependent variables only current ratio have significant relation with firms' value. Keskin and Gökalp (2016) indicated on a study that, current ratio and firms' profitability have significantly negative relation with each others. Doğan and Topal (2016) provided an evidence that, firms' profitability of Istanbul Stock Exchange (ISE) listed companies, and the research is done based on 136 production firms during 2005-2012. From the result of the study statistically significant relation was found between liquid ratios and firms' profitability. Lancaster, Stevens and Jennings (1999) had introduced seven industries (natural resource, construction, manufacturing, service, retail/whole sales, financial and professional service) as sample to their research. And the result from statistical analysis represents that, accrual income have an incremental impact on operational working capital for both liquid ratios (current ratio & quick ratio) and this conclusion is related to manufacturing industry and does not hold to other industries. So the hypothesis can developed as follows:

H_0: *In term of current ratios the differentiation between sectorial groups are not statistically significant.*
H_0: *In term of Acid - test ratios the differentiation between sectorial groups are not statistically significant.*

Jose, Lancaster and Stevens (1996) conducted an empirical study on WCM efficiency and profitability based on large-scale firms. The result from correlation analysis, multiple regression, and nonparametric data analysis indicate that, applying more aggressive liquidity management caused more profitability on several industries like; natural resource, construction, manufacturing, retail/whole sales. And also found that, there is invers relationship between CCC and profitability on other businesses.

Dong and Su (2010) had also conducted an empirical research to analyze the relationship between components of WCM and firms' profitability on Vietnam Stock Market listed companies during 2006 to 2008. The researchers had come to conclusion that, inventory period, account receivable and CCC are negatively associate with each others. The researchers argued that, as inventory conversion to sale prolongs it has negative impact on firms' profitability. Apart form that increase or decrease of account receivable has also impact on the firms' profitability, and by shortening the CCC time span, can create value for the share holders,(Afrifa, 2013, p. 48). Rimo & Panbunyuen, (2010, p. 52) made a study based on eight sectorial groups, had found that, material industry has the lowest level of profitability (4.9110%) and following by energy industry, on the other side the information technology has the highest level of profitability (21.22%) among all industries. Vural, Sökmen and Çetenak (2012) studied the effects of WCM on firms' performance based on 75 manufacturing Istanbul Stock Exchange (ISE) listed firms during 2002-2009. The researchers had concluded from the result of the study that, account receivable period and CCC duration have negative impact on companies' profitability, so shortening the time span of CCC and account receivable period leads to companies' profit maximization. Külter and Demirgüne (2007) indicated on a study based on retails sector during 1997- 2006 had found that, firms' profitability will decrease due to increase on firms' size and debt level of the retails, the other side firms' profitability would be maximized when companies have more investment on working capital and reach to higher market share. Meder and Hafize (2013) had founded on a research based on 52 production enterprise of Istanbul Stock Exchange listed companies during 2000-2010 that, increasing the CCC time lag leads to increase on profitability of production companies which is un expected result.

H_0: *The differentiation between sectorial groups in term of net profit margin are not statistically significant.*

Vural, Sökmen and Çetenak (2012) documented on a study that, firms' size and firms' profitability is positively associated with each others. Yazdanfar and Öhman (2014) indicated on a study that, firms' indicators like; size, age and industry group of the businesses have direct impact on companies'

profitability. Deloof (2003) indicated in a research that, company size has also impact to management of working capital. Large-scale firms have higher bargaining power with their suppliers and customers compare to small-scale firms, for instance large companies easily can delay payment to the suppliers. Company size could be identified by the natural logarithm of sales. Aygün and Akçay (2015) stated on a study based on different sectors of Istanbul Stock Exchange companies (ISE) that, firms' size and firms' profit have positively related with each others. Jose, Lancaster and Stevens (1996) had documented on a study that, CCC and company size are negatively associated. Chiou, Cheng and Wu (2006) had found that, large-scale firms have higher bargaining power, and get benefit from economies of scale and can generate higher level of working capital than smaller firms. Uğurlu and Demir, (2016) had tested the firms' size anomaly of Istanbul Stock Exchange (ISE) Listed companies for three periodical time span, from (1993-2008), (1993-2003) and from (2003-2008). The result from statistical analysis concluded that, the differentiation of portfolio return of small scale companies, medium size and large scale companies are statistically significant during all three time intervals. So the hypothesis can be as follow:

H_0: The differentiation between sectorial groups in term of company size are not statistically significant.

Ata and Ağ (2010) made a research on effect of companies' characteristics on capital structure based on basic metal related industry, metal products, machinery tools industries of ISE listed companies. From the study had found that firms' characteristics like; debt ratio, liquidity ratio, interest coverage ratio have negative effect on firms' capital structure. Rimo and Panbunyuen (2010, p. 55) and Uğurlu and Demir (2016) made empirical researches based on several sectors. The result of statistical analysis indicate that, firms with low debt ratio (total liabilities / total assets) have shorter inventory duration which leads to shorter CCC and effective management of working capital, on revers condition when companies have higher percentage of debt ratio, business are not able to generate fund from internal operation and companies facing poor management of working capital which forced to fund raise from external sources. Burucu and Öndeş (2016) on a study based on 50 manufacturing companies found that, firms' size, profitability, asset combination and liquid ratio have negative impact on firms' borrowing. Chiou, Cheng and Wu (2006) had indicated that, firms with low liquidity are dependent on external fund, which leads to higher debt ratio for the related companies. Based on finding of above mentioned empirical research the hypothesis could be developed as follows:

H_0: *The differentiation between sectorial groups in term total debt ratios are not statistically significant.*

H_0: *The differentiation between sectorial groups in term of interest coverage ratio are not statistically significant.*

Basit and Hassan (2017) conducted a research based on capital structure on firms' performance. The study had taken several industries (chemical, food related products, cement, medicine, auto assembler and textile business) as sample of the study, from Karachi Stock Exchange listed companies. The result from regression analysis found that, companies which are depends more on equity capital have higher equity return compare to firms which are depends on debt finance. Yücel and Kurt (2002) documented on a research that, CCC have positively associated with liquidity and (ROA), and have negative relation with (ROE). The researchers Added that, high ratio of leverage could have negative impact on liquidity and profitability of non-financial firms. Růčková (2015) conducted an empirical study on dependency of return on equity and utilization of finance sources, and the sample of the study had drawn from companies related to three countries; Poland, Solvakia, Hungary and Czech republic. The result from statistical analysis indicate that, the use of external finance is not positively affected by (ROE) and ROE growth of the firms. Kendirli and Konak (2014) Indicated on a study based 19 food and beverage Istanbul Stock Exchange listed companies, that cash conversion period and account receivable period have negative relation with (ROA) and (ROE). Doğan and Topal (2016) conducted an empirical study on firms' profitability of ISE listed companies, and the research was done based on 136 production firms during 2005-2012. The researchers had concluded that, (ROA) and (ROE) are positively associated with total assets and also statistically significant relation were found between firms' profitability and liquid ratios. Demirel, Başci and Karaca (2014) made a research on relationship between WCM and performance indicators based on 5 sectors namely; real estate investment, manufacturing, technology,

mine industry and commercial businesses during 1998 to 2010. The result form the study indicates that, the average level of; ROA, (ROE) and the components of WC (account receivables/account payables periods, inventories and stocks) are different among all sectors, account receivable and stock strategies is highly flexible on real estate sector compare to others. Based on finding of previews studies the related hypothesis could be developed as follows:

H_0: The differentiation between sectorial groups in term of return on equity are not statistically significant.

H_0: The differentiation between sectorial groups in term of return on asset are not statistically significant.

Chauvin and Hirschey (1993) made a research based on a sample of 1500 firms during 1988 to 1990. Provided an evidence that, R&D and business advertising expenditurse have positive impact on market value of the firms. These expenditurse are the main determinants of market value of different sectors. Külter and Demirgüne (2007) stated on a study based on retail sector that, more investment on working capital leads to companies higher market share. Acqua, Etro, Teti and Barbalace (2013) made an empirical analysis on market value and corporate debt, based on firms' debt level in market oriented of United States and United Kingdom related firms and bank oriented of Germany, France and Italy related firms during 2006-2010 on a sample of 3360 firms from different sectors. Finally the researchers made a conclusion that, level of debt is higher in market oriented firms compare to its book value of equity. And added that level of debt can't be explain by book-to- market in bank oriented firms. On revers with the reference to other related study claims that, level of debt is negatively affected by book –to- market ratio in market oriented firms specifically in the United States. So the related hypothesis coulde be formulated as follow:

H_0 *The differentiation between sectorial groups in term of market value & book value are no tstatistically significant.*

Research methodology

The data related to this paper was obtained from Istanbul Stock Exchange (ISE) listed companies during 2008-2016. Totally 29 companies from technology, production and retails sectors had taken as sample to this study. Companies' balance sheets, income statements and other necessary financial data are obtained annually from year 2008 to 2016 on quarter based from Kamuyu Aydınlatma Platformu (KAP), Istanbul Stock Exchange (IES) Data Store, Turkish Share Markets and companies related websites. In order to made a comparative analysis on management of working capitla in term of sectorial groups, the companies financial indicators like; liquidity ratios (current & acid -test ratios), total debt ratio, interest coverage ratio, net profit margin, stock turn over, inventory period, account receivable period, account payable period, average number of days account payable, (ROA), (ROE), operating cycle, CCC, market value/book value and company size considered as dependent variable and the three sectors; manufacturing, technology and retails assumed as independent variablse. Due to existing multiple independent variable the research related hypothesis is tested based on one- way ANOVA analysis.

Research finding and analysis

Manufacturing sector had included to the sample of the study because on this sector more than 50% of its total assets are current assets and current liabilities. Manufacturing is engine of economic growth, from the emerge of United Kingdom during 19th century, to the rise of United States, Germany, Japan and USSR during 20th century as emerging economies and to the recent fast developing economies like; China, South Korea and Taiwan, manufacturing industries had been the key factor to prosperity. Manufacturing industries as engine of economic growth during last three decades had played a significant role on economic development and improving living standards on developing economies. Larger emerging economies grew faster and their contribution on global manufacturing related output had almost doubled and had increased from 21 to 30 percent. During 2000 to 2010 manufacturing contributed 16 % of global GDP, 80% of global trade, 14% of employment and manufacturing value added increased from $5.7 trillion to $7.5 trillion worldwide (McKinsey Global Institute, 2018, March 17). In advanced economies like; United States 17.2 millions of work force had employed on

manufacturing sector, and contributed 11.7% of national GDP on 2010. In Germany this sector contributed 18.7 % of GDP and accounted more than 80% of national export (Haraguchi, Cheng & Smeets, 2017). Where in Turkey manufacturing sector accounted 18,3% of national GDP, 94.8% of total export and 82% of total import during 2017 (TC. Kalkinma Bakanliği, 2014-2018, p. 241). So all countries, except few oil resource based and financial heaven countries had reached to prosperity and economic development only through manufacturing sustainability.

Technology sector had included to the sample of the study due to technological revolution and degitalization of economic activities, the digitalized economic created more business opportunities all over the world, specially for small business and entrepreneurs in developing economies which connected to the world market. The digital applications like; information technology and communication (ITC), e-commerce had promoted entrepreneurship and empowered women entrepreneurs to take parts on creativity, innovation and job creation. ITC related goods and services contributed 6.5% to the global GDP and about 100 million workforce was employed on ITC sector and export of ITC related service had grown to 40% during 2010 to 2015. Global e- commerce sales had reached to US$ 25.3 trillion on 2015, about 90% of this amount was in the form of business to business e- commerce and the remaining 10% was, business to consumer sales. Internet traffic volume are expected to hike 66 times compare to 2005, by 2019 and more than 70% of population on advanced economies are purchasing goods and services online (United Nation Conference on Trade and Development, 2017, pp. 22-26). The information and communication (ICT) sector in Turkey which is undertaken by state since 2012 is growing fast, total amount invested on this sector during 2012 was US$ 1.431 billion (TC. Kalkinma Bakanliği, 2014-2018, p. 254). The state had planned to promote the ICT market coverage from 2.9% of national GDP in 2011 to 8% by 2023, the national market is dominated by communication technology related goods and services. The graduate number of students from ICT related department had increased 29% from 2011 to 2012 and the employment on this sector is on skill based. The usage of computer and Internet is positively correlated with the level of education, also it depends on age categories, the age group of 15 to 24 have the highest share on usage of computer and internet, but in term of genders the male users are doubled compare to female users (Dube et al., 2015).

The retail sector had taken as sample of the study because business operation on this sector is highly depends on current assets and current liabilities. The retail sector's generated income was US$ 22.6 trillion globally on 2015 and it is expected to reach US$ 28 trillion by 2019 with the yearly average growth rate of 3.8% from 2008 on wards. The industry contributed 31% of the global GDP and employed billions of work force across the globe. About 35% of total sales in the retail industry is done by hypermarkets and supermarkets including US and China at the forefront (House of Commons Library, 2018). The whole sellers/retailers represented 11,4% of Turkey's GDP on 2016, and on 2015 it accounted 9.8%, 10.9%, 11.3% and 10% to the GDPs' of Germany, U.K., Italy and France respectively. This sector also had contributed 14.3%, 13.7%, 15.2%, 14.8% and 13% to the total employment of Turkey, Germany, U.K, Italy and France respectively (TC. Kalkinma Bakanliği 2014-2018, p. 241), Yarimoglu and Kursunluoglu (2014). The following table which indicate top 10 world retailers on 2011 shows that, Wal-Mart gained the highest level of revenue US$ 446,950 million with the growth rate of 6% and among those The Home Depot ranked the lowest with the total revenue of 70,395 million dollars and with 3.5% growth rate. Costco had the highest revenue growth rate 14.1%, Carrefour and Metro had the largest foreign market coverage which half of their total revenue is generated from foreign operations (Yarimoglu & Kursunluoglu, 2014).

Table 1. Top 10 global retailers, 2011

Rank	Name	Country of origin	Retail income (US $mil)	Retail revenue growth	Number of countries in operation	% of revenue getting from foreign operation
1	Wal-Mart	US	446,950	6.0%	28	28.4%
2	Carrefour	France	113,197	-9.8%	33	56.7%
3	Tesco	U.K.	101,574	5.8%	13	34.5%
4	Metro	Germany	92,905	-0.8%	33	61.1%
5	Kroger	U.S.	90,374	10.0%	1	0.0%
6	Costco	U.S.	88,915	14.1%	9	27.0%
7	Schwarz	Germany	87,841	5.8%	26	55.8%
8	Aldi	Germany	73,375	3.7%	17	57.1%
9	Walgreen	U.S.	72,184	7.1%	2	1.5%
10	The Home Depot	U.S.	70,395	3.5%	5	11.4%

Source: Yarimoglu (2014)

Normally in quantitative research there are two common types of hypothesis; null hypothesis (H_0) and the opposite of that is alternative hypothesis (H_1). The hypothesis which are formulated in this study, are null hypothesis, which expected to made a comparative analysis on the management of working capital in term of sectorial groups, while the alternative hypothesis are the opposite. In this study 0,05 is considered the significant level to decide whether to accept or reject the null hypothesis, with 95% confidence level. If the (P) value from the result of this analysis is appeared lesser or equal to 0,05 significant level, on this condition the null hypothesis could be rejected, means that H_0 hypothesis is acceptable. On opposite situation, if (P>0,05) significant level, it could be failed to reject the H_0, and null hypothesis is plausible. In order to examine the relationship between dependent and independent variables of this study, one-way ANOVA regression analysis is used to test the formulated hypothesis.

Table 2. Current ratio variable analysis in term of sectorial group

		N	Mean	Std. Deviation	F	p
Current ratio (Dependent variable)	Retailers	36	1,35	0,188	96,727	0,000
	Technology	36	2,35	0,454		
	Manufacturing	36	2,25	0,314		
	Total	108	1,98	0,562		

H_0: In term of current ratios the differentiation between sectorial groups are not statistically significant.

Current ratio variable analysis in term of sectorial group has given on table 1. On the above ANOVA table (P) value is (P = 0,000), which (P<0,05) indicate that variability of current ratio is statistically significant between sectorial groups. The differentiation based on the mean of Tukey test which is applied on above statistical analysis shows that, level of current ratios are different between retailers - technology and retailers – manufacturing. Normally the current ratio of retailers required to be high, but on this analysis is the lowest which is an interesting point. Maintaining optimal level of current ratios could be very important for appropriate business operation as Uluyol and Türk (2013) indicated current ratio have significant relation with firms value. Doğan and Topal, (2016) documented on a study that, current ratio have significant relation with firms' profitability.

Tablo 3. Acid - test ratio variable analysis in term of sectorial group

		N	Mean	Std. Deviation	F	p
Acid - test ratio (Dependent variable)	Retailers	36	0,97	0,180	73,364	0,000
	Technology	36	1,67	0,336		
	Manufacturing	36	1,56	0,251		
	Total	108	1,40	0,404		

H_0: In term of Acid - test ratios the differentiation between sectorial groups are not statistically significant.

Acid - test ratio variable analysis in term of sectorial group has given on Table 2. Based on ANOVA test the model is statistically significant. According to the mean of above Tukey test, the variability of acid - test ratio between three industrial groups are different. Changes have come to the result of mean values due to excluding the inventory item from current assets on above statistical analysis. Again the retails sector have the lowest level of Acid-test ratio. On contrary, Moss and Stine (1993) provided evidence that, higher level of quack ratio represents firms' solvency and company can finance their business operation and leads to proper management of WC.

Table 4. Total debt ratio variable analysis in term of sectorial group

		N	Mean	Std. Deviation	F	p
Total debt ratio (Dependent variable)	Retailers	36	1,97	1,032	22,618	0,000
	Technology	36	1,80	0,425		
	Manufacturing	36	1,00	0,158		
	Total	108	1,59	0,771		

H_0: The differentiation between sectorial groups in term total debt ratios are not statistically significant.

Total debt ratio variable analysis in tem of three sectors has given on Table 3. Based on above ANOVA analysis the (P) value is (P = 0,000), which (P<0,05) represent that, total debt ratio variable in term of sectorial groups are statistically significant. The differentiation based on the Mean of Tukey test which is applied on the above statistical analysis shows that, level of total debt ratios are different between retailers – technology, retailers – manufacturing and technology- manufacturing. The result indicate that manufacturing sector apply more conservative financial strategy, which have consistency as Rimo and Panbunyuen (2010, p. 55) indicated on a study that, firms with low level of debt ratio (total debts / total assets) have quicker inventory period which leads to shorter CCC and effective management of working capital.

Table 5. Interest coverage ratio variable analysis in term of sectorial group

		N	Mean	Std. Deviation	F	p
Interest coverage ratio (Dependent variable)	Retailers	36	2,51	0,661	77,288	0,000
	Technology	36	0,94	0,244		
	Manufacturing	36	2,73	0,915		
	Total	108	2,06	1,038		

H_0: The differentiation between sectorial groups in term of interest coverage ratio are not statistically significant.

İnterest coverage ratio variable analysis in term of sectorial group has given on Table 4. According to ANOVA analysis the model is statistically significant, which indicate that differentiation exist on the level of interest coverage ratio in term of three industries. Based on the mean of above Tukey test, level of interest coverage ratios are different between retailers - technology and retailers – manufacturing sectors. Technology sector has the lowest mean value, and due to usage extreme level of leverage the sector are not able to meet its periodical interest payments. Rimo and Panbunyuen (2010, p. 55) had also confirmed that, when companies have higher percentage of debt ratio, business are not able to generate fund from internal operation and companies facing poor management of working capital.

Table 6. Stock turn over variable analysis in term of sectorial group

		N	Mean	Std. Deviation	F	p
Stock turn over (Dependent variable)	Retailers	36	30,04	16,333	85,830	0,000
	Technology	36	4,69	2,462		
	Manufacturing	36	4,19	1,457		
	Total	108	12,98	15,394		

H_0: The differentiation between sectorial groups in term of stock turn over are not statistically significant.

Stock turn over variable analysis in term of three sectors has given on Table 5. Based on above ANOVA table (P = 0,000), which means that the model is statistically significant. And the differentiation exists on the Mean value of three sectors in term of stock turn over. The result shows that Mean value of stock turn over on manufacturing and technology sectors are closed to each others. Normally the stock turn over of retailers and technology sectors because of merchandise businesses are expected to be close to each others. Dursun and Ayrıçay (2012) made a study based on 120 firms from production and trade sectors of Istanbul Stock Exchange listed companies during 1996-2005 found that, in order to increase the firms' gross profit, needs to minimize the stock turn over. Rimo and Panbunyuen (2010, p. 51) suggested that in production sector need to maintain high inventory volume compare to other industries. Demirel, Başci and Karaca (2014) documented on a study that, account receivable and stock strategies are highly flexible on real estate sector compare to others.

Table 7. Inventory period variable analysis in term of sectorial group

		N	Mean	Std. Deviation	F	p
Inventory period (Dependent variable)	Retailers	36	16,56	9,713	64,297	0,000
	Technology	36	128,76	63,356		
	Manufacturing	36	99,00	39,579		
	Total	108	81,44	64,262		

H_0: In term of inventory period the differentiation between sectorial groups are not statistically significant.

Inventory period variable analysis in term of three sectors has given on Table 6. According to above ANOVA table the model is statistically significant, which demonstrate that, the level of inventory period is different among three sectors. The result from Mean of Tukey test shows that, level of inventory periods are different between retailers – technology, retailers – manufacturing and technology – manufacturing. Technology sector has The longest average inventory period,129 days, which is a very long duration. Rimo and Panbunyuen (2010, p. 51) made a study based on eight sectors (telecommunication, IT, consumer discretionary, consumer staples, energy related firms and materials), found that, consumer staples sector have the highest inventory period (107.13 days) and telecommunication has the lowest inventory period (12.67 days). Şamiloğlu and Demirgüneş (2008) had documented on a study that, long inventory period have negative impact on firms' profitability. Lazaridis and Tryfonidis (2006) indicated that, keeping an optimal level of inventory leads to profit maximization.

Table 8. Account receivable period variability analysis in term of sectorial group.

		No	Mean	Std. Deviation	F	p
Account receivable period (Dependent variable)	Retailers	36	18,21	6,408	176,103	0,000
	Technology	36	2,69	1,327		
	Manufacturing	36	3,87	1,727		
	Total	108	8,26	8,077		

H_0: The differentiation between sectorial groups in term of account receivable period are not statistically significant.

Account receivable variable analysis in term of three sectors has given on Table 7. Based on ANOVA analysis (P) value is (P = 0,000), indicate that variability of account receivable is statistically significant

in term of sectorial group. The result from the Mean of above Tukey test indicate that retailers - technology and retailers- manufacturing sectors are different from each others. The retailers sector have the shortest account receivable period. Demirel, Başci and Karaca (2014) made a research on relationship between WCM and performance indicators based on 5 sectors namely; real estate investment, manufacturing, technology, mine industry and commercial businesses during 1998 to 2010. The result form the study indicates that, account receivables and account payables are different among all sectors. Keskin and Gökalp (2016) indicated on a study that, account receivable duration have highly significant negative impact on firms' profitability. Lazaridis and Tryfonidis (2006) found that, keeping an optimal period for account receivables, account payables and inventory lead firms to profit maximization. Dursun and Ayrıçay, (2012) stated that, in order to increase the firms' gross profit, needs to minimize account receivable period.

Tablo 9. Account payable period variable analysis in term of sectorial group

		N	Mean	Std. Deviation	F	p
Account payable period (Dependent variable)	Retailers	36	3,01	1,113	12,518	0,000
	Technology	36	3,16	1,260		
	Manufacturing	36	4,46	1,622		
	Total	108	3,54	1,487		

H_0: The differentiation between sectorial groups in term of account payable period are not statistically significant.

Account payable variable analysis in term of three sectors has given on Table 8. According to ANOVA table, the differentiation on account payable variable in term of sectorial group are statistically significant. The result from Tukey test indicate that, there is differences on Mean of retailers – manufacturing and technology- manufacturing sectors. The mean of above test shows retail sectors meet its obligation faster than others. As Dursun and Ayrıçay (2012) made an empirical research based on 120 firms from production and trade sectors of Istanbul Stock Exchange listed companies during 1996-2005 had found that, in order to increase the firms' gross profit, needs to minimize account receivable period, prolonging the account payable period and the management required to meet its obligation on or before the maturity time. Normally low profit companies delay its payment to suppliers (Deloof, 2003).

Table 10. Average number of days account payable variable analysis in term of sectorial group.

		N	Mean	Std. Deviation	F	p
Av.no of days a/c. Payable (Dependent variable)	Retailers	36	139,26	52,882	8,253	0,000
	Technology	36	136,03	62,512		
	Manufacturing	36	94,49	38,153		
	Total	108	123,26	55,576		

H_0: The differentiation between sectorial groups in term of average number of days account payable are not statistically significant.

Average number of days account payable analysis in term of three sectors has given on Table 9. Based on ANOVA analysis (P) value is (P = 0,000), indicate that variability of average number of days account payable is statistically significant in term of sectorial group. The result from above Tukey test indicates that, there is differences on mean of retailers – manufacturing and technology- manufacturing sectors. The mean value of above test indicate that manufacturing sector has the shortest average number of days account payable (94 days) compare to two other sectors. Demirel, Başci and Karaca (2014) made a research on relationship between WCM and performance indicators based on 5 sectors namely; real estate investment, manufacturing, technology, mine industry and commercial businesses during 1998 to 2010. The result form the study indicates that, the average level of elements of WC (inventories, stocks, account receivables/payables periods) are different among all sectors. Account receivable and stock strategies is highly flexible on real estate sector compare to others.

Table 11. Operating cycle variable analysis in term of sectorial group.

		N	Mean	Std. Deviation	F	p
Operating cycle (Dependent variable)	Retailers	36	39,91	18,325	67,186	0,000
	Technology	36	309,26	149,034		
	Manufacturing	36	214,40	86,356		
	Total	108	187,86	149,581		

H_0: In term of operating cycle the differentiation between sectorial groups are not statistically significant.

Operating cycle analysis in term of three sectors has given on Table 10. According to ANOVA table, the differentiation on the duration of operating cycle variable in term of sectorial group are statistically significant. The result from above Tukey test indicates that, there is differences on mean of retailers – technology, retailers- manufacturing and technology – manufacturing sectors. The mean of above test represents that, retailers have the shortest operating cycle (40 days) compare to another two sectors.

Table 12. Cash conversion cycle (CCC) variable analysis in term of sectorial group.

		N	Mean	Std. Deviation	F	p
Cash conversion cycle (CCC) (Dependent variable)	Retailers	36	-99,35	43,712	106,343	0,000
	Technology	36	173,24	123,612		
	Manufacturing	36	119,91	63,288		
	Total	108	64,60	144,835		

H_0: The differentiation between sectorial group in term of CCC are not statistically significant.

CCC analysis in term of three sectors has given on Table 11. Based on ANOVA analysis (P) value is (P = 0,000), indicate that variability of CCC is statistically significant in term of sectorial group. The result from Mean of Tukey test shows that, CCC time spans are different between retailers – technology, retailers – manufacturing and technology – manufacturing sectors. Among the mean of three sectors on above table, CCC of retail sector is considerable, which indicate that, since collecting its account receivable, retailers pay their debts 99 days later. It means that with in 99 days firms can finance with out any cost. This result have consistency with Uyar (2009) which made a study based on 166 companies related to different sectors of ISE listed companies on 2007. The result from statistical analysis had found that, retails /wholesaler industry have shorter CCC period compare to manufacturing industry. Rimo and Panbunyuen (2010, p. 57) stated that CCC duration have negative relation with operating cash flow, firms' size and sales' growth. Jose, Lancaster and Stevens (1996) had concluded that, CCC and profitabilities are invers correlation with each others on manufacturing and retails sectors.

Table 13. Net profit margin variable analysis in term of sectorial group.

		N	Mean	Std. Deviation	F	p
Net profit margin (Dependent variable)	Retailers	36	0,02	0,028	34,796	0,000
	Technology	36	0,04	0,066		
	Manufacturing	36	0,11	0,035		
	Total	108	0,06	0,059		

H_0: The differentiation between sectorial groups in term of net profit margin are not statistically significant.

Net profit margin variable analysis in term of sectorial groups has given on Table 12. Based on ANOVA table the net profit margin variability in term of sectorial group are statistically significant. The result from mean of Tukey test represents that, level of net profit margin are different between retailers – technology, retailers – manufacturing and technology – manufacturing sectors. From the three sectors of the model, manufacturing businesses have the highest level of net profit margin 11%. Jose, Lancaster and Stevens (1996) indicated that, applying more aggressive liquidity management caused more profitability on several industries like; natural resource, construction, manufacturing, retail/whole sales. Külter and Demirgüneş (2007) from an empirical research on retails companies' profitability affected

by variables during 1997- 2006 had found that, firms' profitability will decrease due to increase on firms' size and debt level of the retails. On the other side firms' profitability would be maximized when companies' have more investment on working capital and reach to higher market share. Çakir and Kaplan (2012) had founded on a research based on 52 production enterprise of Istanbul Stock Exchange listed companies during 2000-2010 that, increasing the CCC time lag leads to increase on profitability of production companies which is un expected result.

Table 14. Return on asset variable analysis in term of sectorial group.

		N	Mean	Std. Deviation	F	p
Return on asset (ROA) (Dependent variable)	Retailers	36	0,03	0,017	26,699	0,000
	Technology	36	0,02	0,019		
	Manufacturing	36	0,05	0,024		
	Total	108	0,03	0,025		

H_0: The differentiation between sectorial groups in term of return on asset are not statistically significant.

Return on assets (ROA) variable analysis in term of sectorial groups has given on Table 13. Based on ANOVA table the model is statistically significant, which demonstrate that, the level of ROA is different among three sectors. The result from the mean of Tukey test represents that, ROA are different between three sectors of the model. Among above three sectors, manufacturing business has the highest level of ROA (5%). As Demirel, Başci and Karaca (2014) had found on a study based on relationship between WCM and performance indicators based on 5 sectors namely; real estate investment, manufacturing, technology, mine industry and commercial businesses during 1998 to 2010. The result form the study indicates that, the average level of (ROA), (ROE) and the components of WC (account receivables and payables, inventorie periods and stocks,) are different among all sectors.

Table 15. Return on equity variable analysis in term of sectorial group.

		N	Mean	Std. Deviation	F	p
Return on equity (ROE) (Dependent variable)	Retailers	36	0,05	0,083	7,932	0,001
	Technology	36	0,05	0,037		
	Manufacturing	36	0,10	0,045		
	Total	108	0,06	0,062		

H_0: The differentiation between sectorial groups in term of return on equity are not statistically significant.

Return on assets (ROE) variable analysis in term of sectorial groups has given on Table 14. On the above ANOVA table (P) value is (P = 0,001), which (P<0,05) indicate that variability of ROE is statistically significant between sectorial groups. The result from Mean of Tukey test shows that, level of ROE is different between retailers – technology, retailers – manufacturing and technology – manufacturing sectors. Among three sectors of the model, manufacturing business has the highest mean (10%) compare to other sectors.

Table 16. Marke value / Book value variable analysis in term of sectorial group.

		N	Mean	Std. Deviation	F	p
MV/BV (Dependent variable)	Retailers	36	3,92	0,659	130,151	0,000
	Technology	36	1,58	0,418		
	Manufacturing	36	2,43	0,743		
	Total	108	2,64	1,149		

H_0: The differentiation between sectorial groups in term of market value & book value are not statistically significant.

Market value/Book value variable analysis in term of sectorial groups has given on Table 15. Based on ANOVA table the model is statistically significant, which demonstrate that, the level of market value,

book value (M/B) is different among three sectors. The result from the mean of Tukey test represents that, (M/B) are different between three sectors of the model. Among above three sectors, retail businesses has the highest level of (M/B) 3,92 compare to two other sectors. As Külter and Demirgüne (2007) stated on a study based on retail sector that, more investment on working capital leads to companies higher market share. Chauvin and Hirschey (1993) had also made a research based on a sample of 1500 firms during 1988 to 1990, provided an evidence that, R&D and advertising expenditure have positive impact on firms' market value. The expenditure on advertising and R&D are key factors of market value of different sectors of businesses.

Table 17. Company size variable analysis in term of sectorial group.

		N	Mean	Std. Deviation	F	p
Company size (Dependent variable)	Retailers	36	20,98	0,282	483,539	0,000
	Technology	36	18,90	0,254		
	Manufacturing	36	20,41	0,337		
	Total	108	20,10	0,928		

H_0: The differentiation between sectorial groups in term of company size are not statistically significant.

Company size variable analysis in term of sectorial groups has given on Table 15. Based on ANOVA table (P) value is (P = 0,000), which (P<0,05) indicate that variability of company size is statistically significant between sectorial groups. The result from mean of Tukey test shows that, the size of three sectors of the model are slightly different from each others. On contrary Uğurlu and Demir (2016) had tested the firms' size anomaly of ISE Listed companies for three periodical time span, from (1993-2008), (1993-2003) and from (2003-2008). Finally the result from statistical analysis concluded that, the differentiation of portfolio return of small-scale companies, medium size and large scale companies are statistically significant during all three time intervals. Chiou, Cheng and Wu (2006) and Deloof (2003) had also founded that, large companies have higher bargaining power, and get benefit from economies of scale, and can generate higher level of WC than SMEs'.

Conclusion

The study sought to made a comparative analysis on working capital management (WCM) in term of sectorial groups for a sample of 29 ISE listed firms during 2008-2016. And the study conducted based on three main industries like; technology, production and retails sectors. The result form one-way ANOVA analysis found that P = 0,000 and the relationship betwen predictive and outcome variable are significant in all ANOVA tests on this study. The result from table.2 of one-way ANOVA test shows that, the mean of current ratios are different between three sectors. Normally the current ratio of retailers required to be high, but on this analysis, is the lowest which is an interesting point. On table.4 manufacturing sector has the lowest debt ratio. On table .5 technology sector has the lowest mean value of interest coverage ratio. The result of ANOVA on table.7 indicated that technology sector has the longest inventory period (129 days). On table. 11 retail sector has the shortest operating cycle (40 days) compare to other sectors. On table. 12 of the ANOVA analysis again the retail sector has an optimal CCC period. Table. 13 indicated that, manufacturing sector has the highest profit margin. Finally on table number 14 and 13 of ANVOA test present that, manufacturing sector has the highest ROA and ROE compare to other sectors.

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