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THE IMPACT OF WORKING CAPITAL MANAGEMENT PRACTICE ON FIRM PROFITABILITY: AN EVIDENCE FROM MANUFACTURING FIRMS IN ISTANBUL STOCK EXCHANGE

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Abstract

The principal aim of the study is definitely to inspect the influence of working capital management practice on firm profitability of the Turkish chemical, petrol, and plastic manufacturing firms listed on Istanbul Stock Exchange (ISE) for a period of five years (2012 – 2016). Hence, working capital components that employed as independent variables were; accounts receivable period (ARP), inventory conversion period (ICP), accounts payable period (APP), and cash conversion cycle (CCC). The profitability measures that destined to be used as dependent variables were; both return on assets (ROA) and return on equity (ROE) and in addition to that, current ratio (CR), debt ratio (DR), and sales growth (SG) were intended to be applied as control variables. Correlation and regression analysis were employed as a statistical testing tool for the study to uncover the association between independent and dependent variables and then reach the possible goals of the study. As a result, the study witnessed that firm profitability has a positive and negative correlation with ARP and ICP variables respectively. The result also disclosed that ROA has a negative and positive correlation with APP and CCC variables respectively whereas ROE has a positive and negative correlation with APP and CCC variables respectively. Finally, the researcher recommends shortening CCC and APP variables and also building strong communication among purchasing, production, and marketing departments to strengthen the entire business operations and overcome scarcity or excessive inventories.

Keywords: Working Capital Management, Profitability, Manufacturing Firms, Istanbul Stock Exchange.

1. INTRODUCTION

A lot of financial experts and researchers have clearly defined "working capital management" as being the process of formulating and developing strategies, policies, regulations, and guidelines of the short-lived assets and short-lived debts in order to positively reinforce the daily projects to be done successfully. In addition, watching over the firm's short-lived assets and short-lived obligations to continue performing daily activities properly is defined as management of working capital.

A reliable and stable working capital management is simply required to make it easy for a firm to maintain its daily operations without any disruption and pay out its short-lived debts to the creditor in a timely manner. As a result, a great number of business firms irrespective of their type and size have seen themselves in challenging circumstances with the creditors mainly in these modern days, simply because management of the firms don't regularly supervise and cope with the liquidity which is usually the sum of working capital.

Working capital management (WCM) is expected to be given extra attention when it comes to the globalization and its fast currency fluctuations as long as the cost of capital is gradually rising and source of funds is really becoming hard to find in an easy way. Thereby, if a business is definitely ineffective in dealing with working capital variables, then it is not going to only cut down profitability but also lead potentially into a financial meltdown which might possibly ruin the entire business. For that reason, both inadequate and irrational excessive working capital is actually detrimental to a firm's existence.

The fundamental target of the study was to certainly uncover the influence level of working capital management practice on firm profitability of the sampled manufacturing firms listed in Istanbul Stock Exchange for a period of five years from 2012 to 2016.

2. LITERATURE REVIEW

Generally speaking, there are plenty of studies inspected the influence level of working capital management on profitability in a number of countries for different business sectors. Therefore, to test the influence of working capital management variables on firm profitability, first of all, the study analyzed a number of studies from both the worldwide and Turkey and then presented these analyzed studies in the

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following paragraphs below in the form of a time sequential order.

Hence, one of the pioneering studies on this topic was written by Jose, L. Manuel, Lancaster, Carol and Stevens, L. Jerry (1996) whom their final target was to appraise the reciprocal connection between aggressive working capital management and profitability for the period between 1974 and 1993 by applying cash conversion cycle as a working capital management variable and both return on assets and return on equity as a profitability variables. Consequently, they witnessed that cash conversion cycle had an unfavorable influence on profitability in a cross-sectional test.

Smith, M. Beaumont and Begemann, E. (1997) looked into the relationship between return on investment (ROI) variable and multiple variables of working capital management for the South African commercial firms for the period between 1984 and 1993. The used working capital management variables were net trade cycle and cash conversion cycle and return on investment as a profitability variable. Thus, the outcomes of the research proved a trade-off association between liquidity and profitability, as well the same association between the WCM variables and profitability.

Shin, Hyun-Han and Soenen, H. Luc (1998) had applied correlation and regression techniques to uncover the influence of firm's net trade cycle (NTC) on profitability for a sample of 58,985 American companies during the period between 1975 and 1994. The study discovered that shorter NTC brings to an excessive present value of net cash flow and excessive shareholders value. Hence, if the companies engaging shorter NTC, this means that the companies can deal with their working capital properly since the company will involve much less financing from outside.

Lyroudi, Katerina, McCarty, Dan, Lazaridis, John and Chatzigagios, Thomas (1999) dedicated to examining firms which were registered in London stock exchange with the duration of four years. Finally, they concluded that liquidity ratios (CR & QR) and cash conversion cycle have an unfavorable interconnection with profitability namely; return on equity (ROE), net profit margin (NPM), and return in assets (ROA).

Deloof, March (2003) had inspected the interconnection of working capital management and firms' profitability in the period between 1992 and 1996. Finally, His outcomes unveiled a significant negative interconnection of gross operating profit and inventories turnover, accounts payable turnover, and accounts receivable turnover. As a result, it is suggested that the investor's value can be boosted by keeping a minimal number of days of accounts payable, accounts receivable, and inventories.

Eljelly, Abuzar (2004) employed regression and correlation analyses for a statistical test by taking a sample of 929 joint stock companies in Saudi Arabia. As a result, the study pointed out that the interconnection of profitability and its liquidity variables were a significant unfavorable.

Lazaridis, Ioannis and Tryfonidis, Dimitrios (2006) took a sample of 131 firms registered in the Athens Stock Exchange to inspect the interconnection of working capital management and corporate profitability for the duration between 2001and 2004. As a result, they found out that the cash conversion cycle has a significant unfavorable relationship with the firm's profitability namely; gross operating profit. The conclusion uncovered that executives can easily make earnings by managing cash conversion cycle properly for their firms and continuing to keep all other variables of WC namely; inventory, accounts receivable, and accounts payable at the ideal level.

Raheman, Abdul and Nasr, Mohamed (2007) took more than a sample of 94 Pakistani firms registered in Karachi Stock Exchange to study the interconnection of profitability and working capital management (WCM) variables for the period between 1999 and 2004. As a result, the outcomes of the study mentioned that a negative connection is out there between the WCM variables namely; CCC, ARP, ICP, APP and CR and profitability variable namely; net operating profit.

Şamiloğlu, Famil and Demirguneş, Kartal (2008) also took a group of Turkish companies registered in ISE to examine the interconnection of WCM and profitability through the use of a regression analysis tool for the period between 1998 and 2007. The conclusions of the research brought out that there is a negative interconnection of profitability and these WCM variables; ARP, ICP, and leverage ratio, while the interconnection of sales growth variable and profitability is positive.

Uyar, Ali (2009) took both Turkish merchandising and manufacturing firms registered in ISE to explore the interconnection of CCC and profitability and firm size for only 2007 period by making use of ANOVA and correlation analysis as a testing tool. The outcomes of the study showed that the manufacturing firms have longer CCC comparing to the merchandising firms and in addition, the outcomes proved that there is a significant negative link between profitability and CCC variable besides between firm size and CCC.

One more study carried out by Şen, Mehmet and Oruç, Eda (2009) checked out the association between the effectiveness of the WCM and profitability of Turkish firms registered in ISE for the duration between 1993 and 2007 through the use of CCC as a variable of working capital and ROA as a variable for profitability. They witnessed that there is an unfavorable association between the WCM variables namely; ARP, ICP, CCC, net working capital level along with current ratio and ROA variable.

Dong, H. Phuong and Su, Jay-tay (2010) discussed the correlation between the WCM and profitability by working with a group of 130 firms registered in Vietnam Stock Market for the period between 2006 and 2008. They uncovered that there is an unfavorable relationship between the WCM variables namely; CCC, ICP and ARP and operating profit, while the APP variable has a positive correlation with profitability.

Karaduman, A. Hasan, Akbaş H. Emre, Çalışkan, Ö. Arzu and Durer, Salih (2011) inspected the correlation between the WCM and profitability for the Turkish emerging firms for the duration between 2005 and 2009. The CCC was used as a variable of WCM and ROA variable as profitability. They have uncovered a positive relationship between the dwindling CCC variable and the ROA variable.

Karadağlı, Ece (2012) assessed the influence of WCM on profitability by applying a group of Turkish SMEs firms for a period of 9 years between 2002 and 2010. Finally, she identified that the interconnection between the net trade cycle as well as CCC and return on sales as well as stock market return for small firms is a positive, but the CCC and net trade cycle showed a significant unfavorable connection with return on sales as well as, stock market return for bigger firms.

Karadağlı, Ece (2013) assessed the influence of WCM on profitability of 169 Turkish companies for the duratıon between 2001 and 2010 while using panel analysis and she stated an unfavorable connection between the CCC and firm performance with regards to both accounting and market parameters of firm performance and she concluded that a reducing the ARP and APP cause a rise in firm performance with regards to operating income and stock market returns while a cut down in inventory turnover period motives a boost in firm performance relating to stock market returns.

Mengesha, Wobshet (2014) learned the association between the WCM and profitability performance of Ethiopian metal manufacturing firms for the period between 2008 and 2012. The ROA as well ROI were Profitability variables while working capital variables were CCC, ARP, ICP, and APP. Alternatively, control variables used were a CR, firm size, SG, and DR. The research discovered a significant unfavorable connection with the CCC and profitability. Nevertheless, the CCC, ARP, ICP, and APP had nil significant relation with the ROI, but the ARP, ICP, and APP, and CCC were identified to have an unfavorable association with the ROA.

Philip, K. Chemis (2015) took a sample of a Kenyan sugar manufacturing companies to examine the interconnection of the WCM and profitability for the period between 2008 and 2013. The WCM variables used were ARP; APP, ICP, and CCC whereas profitability variables were regarded as ROA. Alternatively, DR, firm size, and the CR was deemed as control variables. Finally, the study identified that APP and ARP have an unfavorable association with profitability, whereas CCC and ICP had shown a positive correlation with profitability.

Öner, Mehtap (2016) took a sample of Turkish manufacturing companies to examine the interconnection of the WCM and profitability for the period between 2005 and 2014. The researcher employed the CCC, ARP, ICP, and APP as independent variables of WCM while operating profit margin was regarded as the dependent variable. The study found out an unfavorable connection between the CCC, ARP, and ICP and the profitability, whereas APP had a positive connection with the profitability variable. The study recommended that companies ought to possibly apply diminishing their CCC, ARP, and ICP to enhance their profitability.

Gorondutse, H. Abdullahi, Ali, A. Rahima and Ali, Abass (2016) looked into the influence of trade receivables and inventory management of Malaysian small and medium manufacturing firms from the duration between 2006 and 2012. The study used CCC, ARP, ICP, and APP as independent variables while dependent variables were ROA, ROE and net operating profit. The outcomes revealed an unfavorable connection between ARP and ICP and profitability. Finally, the researchers recommended that the WC managers ought to reduce the CCC, ARP, APP, and ICP in order to possibly enhance profitability rate.

3. DATA AND METHODOLOGY

This section goes a step in depth by simply demonstrating the techniques to gather data for proving that management of working capital observably is vital for manufacturing firms such as;

chemical, petrol and plastic.

3.1. Research Design

The researcher chose to employ a quantitative approach with an explanatory research design which is often known as "hypothesis-testing" to normally analyze the gathered data and check out the interconnection of working capital management components and profitability.

3.2. Population and Sampling Techniques

The population of the study purely consisted of 20 Turkish chemical, petrol and plastic manufacturing firms registered in ISE for a period of five years (2012 – 2016). The non-probabilistic sampling technique particularly purposive sampling which is known as "homogeneous sampling" was employed to stay away from any sort of incomplete or unrelated data.

3.3. Data Collection and Analysis

The researcher preferred to apply secondary data as a data collection tool in order to gather the required relevant data from externally audited financial statements reported in the form of profit & loss statement and balance sheet. Descriptive statistics, correlation, and regression analyses were employed in the study to check out the interconnection of dependent and independent variables.

3.4. Hypothesis Testing

The researcher formulated the following hypotheses for the study to find out intensely the overall level of influence between working capital management variables and profitability variables.

Thus; the first hypothesis was as the following;

H_0: There is an insignificant connection between the accounts receivable period (ARP) and the firm profitability (ROA and ROE) of the Turkish chemical, petrol, and plastic manufacturing firms in ISE.

H_1: There is a significant connection between the accounts receivable period (ARP) and the firm profitability of the Turkish chemical, petrol, and plastic manufacturing firms in ISE.

The second hypothesis was as the following;

H_0: There is an insignificant correlation between the inventory conversion period (ICP) and the firm profitability of the Turkish chemical, petrol, and plastic manufacturing firms in ISE.

H_1: There is a significant correlation between the inventory conversion period (ICP) and the firm profitability of the Turkish chemical, petrol, and plastic manufacturing firms in ISE.

The third hypothesis was as the following;

H_0: There is an insignificant relationship between the accounts payable period (APP) and the firm profitability of the Turkish chemical, petrol, and plastic manufacturing firms in ISE.

H_1: There is a significant relationship between the accounts payable period (APP) and the firm profitability of the Turkish chemical, petrol, and plastic manufacturing firms in ISE.

The fourth hypothesis was as the following;

H_0: There is an insignificant association between the cash conversion cycle (CCC) and the firm profitability of the Turkish chemical, petrol, and plastic manufacturing firms in ISE.

H_1: There is a significant association between the cash conversion cycle (CCC) and the firm profitability of the Turkish chemical, petrol, and plastic manufacturing firms in ISE.

3.3. Variables Description and Model Specification

The study was clearly classified the proxy variables into three parts namely; dependent variables, independent variables, and control variables. Therefore, the dependent variables comprised of return on assets (ROA) and return on equity (ROE) which were generally used to calculate profitability percentage. Accounts receivable period (ARP), inventory conversion period (ICP), accounts payable period (APP) and cash conversion cycle (CCC) were the independent variables to point out the statistics which were indeed going to determine the level of efficiency of the working capital management. Finally, current ratio (CR), debt ratio (DR) and sales growth (SG) were control variables of the study which assumed to reveal the statistics that were going to be applied for determining the influence of a firm's liquidity, leverage and sales growth.

The study estimated this model which was drawn in the form of an equation in order to uncover the interconnection between dependent variables and independent variables which were composed of four working capital management variables and three control variables as following:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \beta_4 X_{it} + \beta_5 X_{it} + \beta_6 X_{it} + \beta_7 X_{it} + \varepsilon_{it} \quad \text{(Equation)}$$

The notations of the above formula were described below;

Y_{it}: The dependent variable, X_{it}: The independent variables, β_0: The intercept of the equation, β_1 - β_7: The coefficients of independent variables, and ε_{it}: The error term.

Accordingly, the study used the following specified separate models in accordance with the formulated hypotheses to check out the deeper interconnection of working capital management components and profitability variables:

Model 1: This model was in fact used to test the first hypothesis of the study which identifies if there is an insignificant or significant connection between the accounts receivable period (ARP) and the firm profitability (ROA and ROE) for the sampled manufacturing firms in ISE;

A) $ROA = \beta_0 + \beta_1 (ARP_{it}) + \beta_2 (CR_{it}) + \beta_3 (DR_{it}) + \beta_4 (SG_{it}) + \varepsilon_{it}$

B) $ROE = \beta_0 + \beta_1 (ARP_{it}) + \beta_2 (CR_{it}) + \beta_3 (DR_{it}) + \beta_4 (SG_{it}) + \varepsilon_{it}$

Model 2: This model was indeed used to check out the second hypothesis of the study which confirms if there is an insignificant or significant correlation between the inventory conversion period (ICP) and the firm profitability for the sampled manufacturing firms in ISE;

A) $ROA = \beta_0 + \beta_1 (ICP_{it}) + \beta_2 (CR_{it}) + \beta_3 (DR_{it}) + \beta_4 (SG_{it}) + \varepsilon_{it}$

B) $ROE = \beta_0 + \beta_1 (ICP_{it}) + \beta_2 (CR_{it}) + \beta_3 (DR_{it}) + \beta_4 (SG_{it}) + \varepsilon_{it}$

Model 3: This model came to be used to verify the third hypothesis of the study which ascertains if there is an insignificant or significant relationship between the accounts payable period (APP) and the firm profitability for the sampled manufacturing firms in ISE;

A) $ROA = \beta_0 + \beta_1 (APP_{it}) + \beta_2 (CR_{it}) + \beta_3 (DR_{it}) + \beta_4 (SG_{it}) + \varepsilon_{it}$

B) $ROE = \beta_0 + \beta_1 (APP_{it}) + \beta_2 (CR_{it}) + \beta_3 (DR_{it}) + \beta_4 (SG_{it}) + \varepsilon_{it}$

Model 4: This model came to be used to evaluate the fourth hypothesis of the study which discovers if there is an insignificant or significant association between the cash conversion cycle (CCC) and the firm profitability for the sampled manufacturing firms in ISE;

A) $ROA = \beta_0 + \beta_1 (CCC_{it}) + \beta_2 (CR_{it}) + \beta_3 (DR_{it}) + \beta_4 (SG_{it}) + \varepsilon_{it}$

B) $ROE = \beta_0 + \beta_1 (CCC_{it}) + \beta_2 (CR_{it}) + \beta_3 (DR_{it}) + \beta_4 (SG_{it}) + \varepsilon_{it}$

The notations of the above formulas were described below;

ROA: Return on Assets,

ROE: Return on Equity,

β_0: The intercept of the equation,

β_1 - β_7: The coefficients of independent variables,

ARP: Accounts Receivable Period,

ICP: Inventory Conversion Period,

APP: Accounts Payable Period,

CCC: Cash Conversion Cycle,

CR: Current Ratio,

DR: Debt Ratio,

SG: Sales Growth,

ε_{it}: The error term.

4. FINDINGS

This section proceeded to present the analyzed data from descriptive statistics, correlation and linear regression analyses and then interpreted the results of the study below.

Table 1: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
ROA	100	-7.68	34.72	7.2627	7.11362
ROE	100	-16.08	62.21	13.9567	12.89208
ARP	100	1.54	220.99	81.5987	50.55073
ICP	100	6.09	249.26	83.0183	56.92737
APP	100	17.05	200.27	75.0076	39.07216
CCC	100	-29.59	318.79	89.6092	85.75872
CR	100	38.82	1164.71	193.9672	160.20305
DR	100	8.73	88.73	47.7143	17.37664
SG	100	-12.34	85.60	10.8787	17.02714

The above table pointed that the average value of the return on assets (ROA) is 7.26% of the overall assets with a standard deviation of 7.11%. The minimum value of ROA is -7.68% while its maximum value is 34.72%. The return on equity (ROE) has an average value of 13.96% with a standard

deviation of 12.89%. The minimum and maximum values of the ROE are -16.08% and 62.21% respectively. The accounts receivable period (ARP) has an average value of 81.60 days with a standard deviation of 50.55 days. The minimum time of ARP is 1.54 days, while the maximum time is 220.99 days. The inventory conversion period (ICP) has an average of 83.02 days and the standard deviation of inventory turnover period is 56.92 days. The minimum time of ICP is 6.09 days, while the maximum time is 249.26 days. The accounts payable period (APP) takes an average of 75.01 days with a standard deviation of 39.07 days. The minimum time of APP is 17.05 days, while the maximum time is 200.27 days. The cash conversion cycle (CCC) has an average of 89.61 days with a standard deviation of 85.76 days. The minimum value of the CCC is -29.59 days and the maximum value is 318.79 days.

Table 2: Pearson's Correlation Matrix

		ROA	ROE	ARP	ICP	APP	CCC	CR	DR	SG
ROA	Pearson Correlation	1								
	Sig. (2-tailed)									
ROE	Pearson Correlation	.894**	1							
	Sig. (2-tailed)	.000								
ARP	Pearson Correlation	.072	.109	1						
	Sig. (2-tailed)	.479	.282							
ICP	Pearson Correlation	-.084	-.113	.179	1					
	Sig. (2-tailed)	.405	.264	.075						
APP	Pearson Correlation	-.099	.091	.157	.085	1				
	Sig. (2-tailed)	.328	.368	.120	.400					
CCC	Pearson Correlation	.031	-.052	.637**	.730**	-.307**	1			
	Sig. (2-tailed)	.757	.606	.000	.000	.002				
CR	Pearson Correlation	.219*	.038	.057	.303**	-.317**	.379**	1		
	Sig. (2-tailed)	.029	.707	.573	.002	.001	.000			
DR	Pearson Correlation	-.355**	.013	.205*	-.062	.533**	-.163	-.621**	1	
	Sig. (2-tailed)	.000	.899	.041	.540	.000	.105	.000		
SG	Pearson Correlation	.241*	.206*	.143	.080	.062	.109	.033	-.018	1
	Sig. (2-tailed)	.016	.040	.157	.427	.537	.280	.744	.861	
**. Correlation is significant at the 0.01 level (2-tailed).										
*. Correlation is significant at the 0.05 level (2-tailed).										

The positive correlation between ARP and ROA claims that there is a correlation coefficient of 0.072 with P-value of 0.479 and this result signifies that these two variables which are the ARP and ROA have an insignificant positive correlation. There is also a positive correlation between the CCC and ROA with a correlation coefficient of 0.031 and P-value of 0.757 and this translates that the CCC and ROA have an insignificant positive correlation. The negative connection between the ICP and ROA comments that there is a correlation coefficient of -0.084 with P-value of 0.405 and this seems to indicate that the ICP has an insignificant negative correlation with the ROA. The APP has a negative association with the ROA which indicates a correlation coefficient of -0.099 and P-value of 0.328, in addition to, this outcome highlights that the APP has an insignificant negative correlation with the ROA. The ROE has a positive association with the ARP which discloses that there is an insignificant positive correlation between both of these variables with an R-value of 0.109 and P-value of 0.282. There is a positive association between the APP and ROE with an R-value of 0.091 and P-value of 0.368 and this claims that the APP and ROE have an insignificant positive correlation. There is a negative connection between the ICP and ROE with an R-value of -0.113 and P-value of 0.264 and this denotes that both the ICP and ROE have an insignificant negative correlation. Finally, there is a negative connection between the CCC and ROE with an R-value of -0.052 and P-value of 0.606 and both of these variables which are the CCC and ROE have an insignificant negative correlation.

In conclusion, the correlation analysis outcomes accept all the null hypothesis and reject all the alternative hypothesis of the study.

The regression between ARP and ROA was studied here by employing model 1 (A) in the analysis.

Table 3: Model Summary[b]

Model 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
A	.442[a]	.196	.162	6.51275
a. Predictors: (Constant), ARP, CR, DR, SG				
b. Dependent Variable: ROA				

Table 4: ANOVA[a]

Model 1		Sum of Squares	DF	Mean Square	F	Sig.
A	Regression	980.256	4	245.064	5.778	.000[b]
	Residual	4029.506	95	42.416		
	Total	5009.762	99			
a. Dependent Variable: ROA						
b. Predictors: (Constant), ARP, CR, DR, SG						

The R-value of 0.442 suggests that the predictors have an association with the ROA. Additionally, the Adjusted R Square is 0.162 (16.2%) which claims that the executed formula is a modest fit for forecasting the ARP. This simply means 16.2% of the variance in the ROA is described by the predictors of the model. In the ANOVA table 4, the executed model 1 (A) is fit for forecasting the ARP with F-value of 5.78 and zero P-value. In conclusion, the exposed result proves that the model 1 (A) fits to clarify the connection between the predictors and the ROA since the overall level of significance is approximately 0.001. As a result, when the P-value is lower than 0.05, there exists a solid proof against the null hypothesis, thus the null hypothesis is rejected and the alternative hypothesis is accepted.

The regression between ARP and ROE was inspected here by employing model 1 (B) in the analysis.

Table 5: Model Summary[b]

Model 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
B	.224[a]	.050	.010	12.82709
a. Predictors: (Constant), ARP, CR, DR, SG				
b. Dependent Variable: ROE				

Table 6: ANOVA[a]

Model 1		Sum of Squares	DF	Mean Square	F	Sig.
B	Regression	823.609	4	205.902	1.251	.295[b]
	Residual	15630.755	95	164.534		
	Total	16454.364	99			
a. Dependent Variable: ROE						
b. Predictors: (Constant), ARP, CR, DR, SG						

The R-value of 0.224 confirms that the predictors have a relationship with the ROE. Furthermore, the Adjusted R Square is 0.10 (10%) which declares that the implemented formula is an extremely poor fit for forecasting the ARP. This simply means 10% of the variance in ROE is described by the predictors of the model. In the ANOVA table 6, the implemented model 1 (B) is definitely not fit for forecasting the ARP with 1.25 of F-value and 0.295 of P-value. In conclusion, the exposed result proves that the model 1 (B) does not essentially fit to clarify the relationship between the predictors and the ROE since the overall level of significance is approximately 0.295. Eventually, when P-value is higher than 0.05, there exists a poor proof against the null hypothesis, thus the alternative hypothesis is rejected and the null hypothesis is accepted.

The regression between ICP and ROA was discovered here by employing model 2 (A) in the analysis.

Table 7: Model Summary[b]

Model 2	R	R Square	Adjusted R Square	Std. Error of the Estimate
A	.445[a]	.198	.165	6.50169
a. Predictors: (Constant), ICP, CR, DR, SG				
b. Dependent Variable: ROA				

Table 8: ANOVA[a]

Model 2		Sum of Squares	DF	Mean Square	F	Sig.
A	Regression	993.919	4	248.480	5.878	.000[b]
	Residual	4015.843	95	42.272		
	Total	5009.762	99			

a. Dependent Variable: ROA
b. Predictors: (Constant), ICP, CR, DR, SG

The R-value of 0.445 suggests that the predictors have a connection with the ROA. Besides, the Adjusted R Square is 0.165 (16.5%) which asserts that the employed formula is a modest fit for forecasting the ICP. This simply means 16.5% of the variance in ROA is described by the predictors of the model. In the ANOVA table 8, the employed model 2 (A) is definitely fit for forecasting the ICP with F-value of 5.88 and zero P-value. In conclusion, the found out result proves that the model 2 (A) fits to clarify the link between the predictors and the ROA since the overall level of significance is approximately 0.001. Subsequently, when the P-value is lower than 0.05, there exists a solid proof against the null hypothesis, thus the null hypothesis is rejected and the alternative hypothesis is accepted.

The regression between ICP and ROE was explored here by employing model 2 (B) in the analysis.

Table 9: Model Summary[b]

Model 2	R	R Square	Adjusted R Square	Std. Error of the Estimate
B	.264[a]	.070	.031	12.69324
a. Predictors: (Constant), ICP, CR, DR, SG				
b. Dependent Variable: ROE				

Table 10: ANOVA[a]

Model 2		Sum of Squares	DF	Mean Square	F	Sig.
B	Regression	1148.127	4	287.032	1.781	.139[b]
	Residual	15306.237	95	161.118		
	Total	16454.364	99			
a. Dependent Variable: ROE						
b. Predictors: (Constant), ICP, CR, DR, SG						

The R-value of 0.264 approves that the predictors have an association with the ROE. In addition, the Adjusted R Square is 0.031 (3.1%) which declares that the applied formula is an extremely poor fit for forecasting the ICP. This simply means 3.1% of the variance in ROE is described by the predictors of the model. In the ANOVA table 10, the applied model 2 (B) is absolutely not fit for forecasting the ICP with 1.78 of F-value and 0.139 of P-value. In conclusion, the uncovered result proves that the model 2 (B) does not fit to clarify the interconnection between the predictors and the ROE since the overall level of significance is approximately 0.139. Therefore, when the P-value is higher than 0.05, there exists a poor proof against the null hypothesis, hence the alternative hypothesis is rejected and the null hypothesis is accepted.

The regression between APP and ROA was tested here by employing model 3 (A) in the analysis.

Table 11: Model Summary[b]

Model 3	R	R Square	Adjusted R Square	Std. Error of the Estimate
A	.435[a]	.189	.155	6.53908
a. Predictors: (Constant), APP, CR, DR, SG				
b. Dependent Variable: ROA				

Table 12: ANOVA[a]

Model 3		Sum of Squares	DF	Mean Square	F	Sig.
A	Regression	947.606	4	236.902	5.540	.000[b]
	Residual	4062.156	95	42.760		
	Total	5009.762	99			
a. Dependent Variable: ROA						
b. Predictors: (Constant), APP, CR, DR, SG						

The R-value of 0.435 specifies that the predictors have a relationship with the ROA. Moreover, the Adjusted R Square is 0.155 (15.5%) which highlights that the utilized formula is a modest fit for forecasting the APP. This simply means 15.5% of the variance in ROA is described by the predictors of the model. In the ANOVA table 12, the utilized model 3 (A) is definitely fit for forecasting the APP with F-value of 5.54 and zero P-value. In conclusion, the found result proves that the model 3 (A) fits to clarify the connection between the predictors and the ROA since the overall level of significance is approximately 0.001. Consequently, when the P-value is lower than 0.05, there exists a solid proof against the null hypothesis, hence the null hypothesis is rejected and the alternative hypothesis is accepted.

The regression between APP and ROE was verified here by employing model 3 (B) in the analysis.

Table 13: Model Summary[b]

Model 3	R	R Square	Adjusted R Square	Std. Error of the Estimate
B	.228[a]	.052	.012	12.81357
a. Predictors: (Constant), APP, CR, DR, SG				
b. Dependent Variable: ROE				

Table 14: ANOVA[a]

Model 3		Sum of Squares	DF	Mean Square	F	Sig.
B	Regression	856.534	4	214.133	1.304	.274[b]
	Residual	15597.830	95	164.188		
	Total	16454.364	99			
a. Dependent Variable: ROE						
b. Predictors: (Constant), APP, CR, DR, SG						

The R-value of 0.228 determines that the predictors have a connection with the ROE. Furthermore, the Adjusted R Square is 0.012 (1.2%) which declares that the exploited formula is a tremendously poor fit for forecasting the APP. This basically means 1.2% of the variance in ROE is described by the predictors of the model. In the ANOVA table 14, the exploited model 3 (B) is completely not fit for forecasting the APP with 1.30 of F-value and 0.274 of P-value. In conclusion, the disclosed result proves that the model 3 (B) does not fit to clarify the association between the predictors and the ROE since the overall level of significance is approximately 0.274. As a consequence, when the P-value is higher than 0.05, there exists a poor proof against the null hypothesis, hence the alternative hypothesis is rejected and the null hypothesis is accepted.

The regression between CCC and ROA was checked here by employing model 4 (A) in the analysis.

Table 15: Model Summary[b]

Model 4	R	R Square	Adjusted R Square	Std. Error of the Estimate
A	.429[a]	.184	.150	6.55865
a. Predictors: (Constant), CCC, CR, DR, SG				
b. Dependent Variable: ROA				

Table 16: ANOVA[a]

Model 4		Sum of Squares	DF	Mean Square	F	Sig.
A	Regression	923.249	4	230.812	5.366	.001[b]
	Residual	4086.513	95	43.016		
	Total	5009.762	99			
a. Dependent Variable: ROA						
b. Predictors: (Constant), CCC, CR, DR, SG						

The R-value of 0.429 confirms that the predictors have a correlation with the ROA. Further, the Adjusted R Square is 0.150 (15%) which remarks that the developed formula is a modest fit for forecasting the CCC. This essentially means 15% of the variance in ROA is described by the predictors of the model. In the ANOVA table 16, the developed model 4 (A) is simply fit for forecasting the APP with 5.37 of F-value and 0.001 of P-value. In conclusion, the presented result proves that the model 4 (A) fits to clarify the relationship between the predictors and the ROA since the overall level of significance is precisely 0.001. As a result, when the P-value is lower than 0.05, there exists a solid proof against the null hypothesis, hence the null hypothesis is rejected and the alternative hypothesis is accepted.

The regression between CCC and ROE was exposed here by employing model 4 (B) in the analysis.

Table 17: Model Summary[b]

Model 4	R	R Square	Adjusted R Square	Std. Error of the Estimate
B	.235[a]	.055	.015	12.79189
a. Predictors: (Constant), CCC, CR, DR, SG				
b. Dependent Variable: ROE				

Table 18: ANOVA[a]

Model 4		Sum of Squares	DF	Mean Square	F	Sig.
B	Regression	909.277	4	227.319	1.389	.244[b]
	Residual	15545.087	95	163.632		

	Total	16454.364	99			
a. Dependent Variable: ROE						
b. Predictors: (Constant), CCC, CR, DR, SG						

The R-value of 0.235 confirms that the predictors have a connection with the ROE. Besides that, the Adjusted R Square is 0.015 (1.5%) which expresses that the hired formula is a vastly poor fit for forecasting the CCC. This almost means 1.5% of the variance in ROE is described by the predictors of the model. In the ANOVA table 18, the hired model 4 (B) is entirely not fit for forecasting the CCC with 1.39 of F-value and 0.244 of P-value. In conclusion, the unveiled result proves that the model 4 (B) does not fit to clarify the interconnection between the predictors and the ROE since the overall level of significance is 0.244. Accordingly, when the P-value is higher than 0.05, there exists a poor proof against the null hypothesis, hence the alternative hypothesis is rejected and the null hypothesis is accepted.

5. CONCLUSION

According to the linear regression analysis results, the statistically positive correlation between the ARP and firm profitability (i.e. ROA and ROE) signifies that increasing the accounts receivable collection period will probably level up the firm profitability of the Turkish chemical, petrol, and plastic manufacturing firms or vice versa. The statistically negative correlation between the ICP and firm profitability signifies that if the chemical, petrol, and plastic manufacturing firms hold excessive stocks, these firms will generate insufficient earnings but if they shorten the ICP, they will boost their earnings. Furthermore, the statistical correlation between the APP and firm profitability signifies that if the Turkish chemical, petrol, and plastic manufacturing firms prolong the time period to pay off their outstanding payment balance, it will have an effect on their ROA in an unfavorable way but oppositely it will have a favorable influence on their ROE. Finally, the statistical correlation between the CCC and firm profitability signifies that if the sampled chemical, petrol, and plastic manufacturing firms extend the time period to convert their resources into cash, it will have an influence on their ROA in a favorable way but oppositely it will have an unfavorable effect on their ROE. As a result, it's concluded that the financial managers or working capital responsible personnel should definitely have huge attention for watching over and managing these kinds of working capital management elements properly since they have at least a positive or negative influence on the profitability of the Turkish chemical, petrol, and plastic manufacturing firms registered in Istanbul Stock Exchange.

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