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RELATIONSHIP OF WORKING CAPITAL TO CORPORATE PERFORMANCE AND STOCK PRICE: EVIDENCE FROM THE MANUFACTURING SECTOR OF PAKISTAN

Noheed Khan ^{1*}, Muhammad Bilal ², Imran Riaz Malik ², Abdul Rauf Kashif ², and Abdul Rehman Sajid ²

¹ College of Commerce, Government College University Faisalabad (GCUF), PAKISTAN.
 ² Department of Business Administration, Iqra University Islamabad Campus, PAKISTAN.

ARTICLEINFO	A B S T R A C T
Article history: Received 15 October 2019 Received in revised form 19 June 2020 Accepted 06 July 2020 Available online 25 July 2020. Keywords: Current ratio (CR); Cash; Stock Price (SP); Net operating profitability; Working capital management (WCM); Cash conversion cycle (CCC); Inventory turnover.	Working capital plays a significant role in the manufacturing sector. The recent study is based on the manufacturing sector of Pakistan. Thirteen manufacturing sectors were selected for this research. For analyzing the results, a univariate test was performed under a generalized linear model. The results reveal that cash has a negative impact on operating profitability. The Construction & Materials, Automobiles & Parts, Forestry & Paper, and Food Product sectors experience negative impacts on operating profitability. The Pharma & Biotech and the Chemicals sectors see highly negative impacts on operating profitability. Working capital management in some sectors have positive and some have negative impacts on the stock price. Disciplinary: Management Sciences (Finance).
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1. INTRODUCTION

The manufacturing sector is the second-largest sector after the agricultural sector in Pakistan. According to the "2011-2012 Economic Survey of Pakistan", the Pakistani manufacturing sector growth rate was 3.65%, a 23.31% increase compared to the previous year. The modest growth has been observed in the manufacturing sector for 2011-2012. The Quantum Index of the manufacturing sector (QIM) increased by 1.05% compared to the previous year. The base year was revised in 2011 and 2012 because new industries were added (Survey, 2012). Nevertheless, manufacturing sector firms are facing working capital management (WCM) problems. The mismanagement of working capital (WC) can increase production costs. It directly affects firm liquidity and profitability (Afza & Nazir, 2007; Nazari and Jamshidinavid, 2019).

Previous studies have investigated the importance of WCM from different perspectives. For example, Haq et al. (2011) discuss the relationship WCM has with the profitability of a company.

Higher shareholder wealth depends upon current assets and short-term financing (Nwankwo & Osho, 2010). The stock price of a company indicates the shareholder wealth of the company. The stock price can change due to government policies and industry performance. Industry performance can change investor preferences (Bockman, 2011). The objective of this research is to find the association between WCM, profitability and the stock price of companies. This study provides two major contributions. First, this study describes the importance of WCM for operating profitability (OP) and stock price (SP) of companies. Second, this research extends the concept of WCM with respect to stock price. The findings of the study reveal that the current ratio has a positive impact on SP and APPD has a negative impact on SP. Some sectors see a positive and negative impact on the stock price.

2. LITERATURE REVIEW

2.1 WORKING CAPITAL MANAGEMENT

The foundation of WCM is based on "current assets" and "currents liabilities". Current liabilities consist of creditors, bills payable, notes payable, and short term debt. WCM plays a significant role in company profitability and risk. It also plays a significant role in financial planning (Enqvist et al., 2014). WCM practices change over time (Filbeck & Krueger, 2005). High levels of WC utilization of input and increase the production while the uncertain WC decreases the production level (Mahmoudzadeh et al., 2017).

2.2 WORKING CAPITAL MANAGEMENT AND PROFITABILITY

Prior research examined the elements of WCM. For example, the CCC is a main element of WC. Cash holdings have always had less value for investors (Pinkowitz et al., 2003). Sayaduzzaman (2007) reveals a negative association between WCM and profitability. Raheman and Nasr (2007) argue that WC has a relationship with capital expenditures. WCM policies always enhance the profitability of companies. Appuhami (2008) finds a negative association between WC policies and firm profitability, using aggressive financing policy and investment policy for WCM. Afza and Nazir (2008) found a negative relationship between aggressive investment and financial policies, from examining seventeen industry groups on the Karachi Stock Exchange. The result suggests that CCC affects an organization's operating cycle. Aggressive WCM policies increase corporate performance. The cash conversion cycle negatively impacts on corporate profitability and SP of the company (Zeidan & Shapir, 2017).

Banomyong (2005) argues that companies can perform better with a short conversion cycle. Raheman et al. (2010) examine the association between WCM and profitability, using CCC and ACP for investigating the link with profitability. The study finds that the CCC directly affects the performance of a manufacturing firm. Manufacturing firms normally face collection and payment problems. Uyar (2009) finds a negative association between CCC and profitability of a firm and also a negative association among the CCC and firm size. Alipour (2011) found a negative association between CCC and ACP with profitability. Charitou et al. (2010) examine the association between WCM and firm performance using cash conversion and company profitability. Keown, Martin, Petty, and Scott (2003) explains the importance of the CCC. Ortín-Ángel and Prior (2004) identify problems with the CCC and suggest some assumptions for the CCC.

Gill et al. (2010) observe the association between WCM and profitability. The findings recommend that when companies have a long collection period, then companies do lose profit. The long collection period always decreases the profitability of the companies. Mathuva (2015) shows that the CCC, ITORD, sales outstanding, and APPD, all have links with company performance. Farris (2002) suggests that companies can enhance the collection with fast payment periods if companies allow discounts to debtors. Deloof (2003) found that profitability decreases the number of accounts receivable. ACP directly affects the CCC and this CCC affects the company profit.

A large proportion of current assets creates negative impacts on profitability, while a small proportion of current assets can create liquidity problems for a firm. Eljelly (2004) argues that "current assets and current liabilities" are a major component of WCM planning. The INTORD plays a vibrant role in WCM. Chen et al. (2005) argue that inventory levels decline when companies change their inventory turnover ratio from 96 to 81 days. Randall and Ulrich (2001) examine the association between supply chain structure and a classical inventory model. Proper WCM in manufacturing companies can increase the profitability of companies.

The level of cash is very important for profitability (Mun & Jang, 2015). Theodore Farris and Hutchison (2002) suggest that if companies use electronic payment methods, then they can decrease the time of the payment period. Gill et al. (2010) argue that profitability has a negative association with a firm's APPD and a positive relationship with the CCC. Charitou et al. (2010) indicate that the CCC and its major components, for example, ITORD, day's sales outstanding, and APPD, are connected with firm profitability. The changes in bank credit also effect on WCM (Chen & Kieschnick, 2017). Nazir and Afza (2009) find a negative association between firm profitability and aggressive WCM policy. According to Afza and Nazir (2011), WCM affects the cement industry of Pakistan. Haq et al. (2011) discuss the association between WCM and profitability. We thus propose the hypothesis

H1. Working capital management has a negative relationship with profitability.

2.3 WORKING CAPITAL MANAGEMENT AND STOCK PRICE

Literature has provided evidence about WCM and stock prices. Mohamad and Saad (2010) examine the association between WCM policies and stock returns in Swedish firms. They suggest that WC correlates with the stock returns of companies. Moreover, WC does not correlate with stock performance in the manufacturing sector. Karchani and Givaki (2014) describe the association between WCM and SP, using a sample of 179 manufacturing companies listed on the Tehran stock exchange. The findings show that moderating and aggressive policies do not associate with SP but conservative WCM policies have a strong relationship with SP. The low-level investment in WC increases firm market performance (He et al., 2017). We thus propose the hypothesis

H2: Working capital management has a positive relationship with the stock price.

3. METHODOLOGY

3.1 DATA

This research is based on data from thirteen manufacturing sectors in Pakistan. Data were collected from companies' websites from 2006 to 2011. Forty-three manufacturing companies' data were used for recent empirical investigation. Every company is included in the KSE100Index. The

sector-wise detail of the companies is as follows. Construction & Materials sector has seven companies; three companies are included in Automobile & Parts sector, General Industries has two companies, one company belongs to Forestry & Paper, Food Products sector consists of the four companies, one company belong to Households Goods, Personal Goods consists of the three companies, two companies related to Pharma & Biotech sector, four companies have associated with Chemicals, Oil & Gas sector consists of the ten companies, two companies link with the Tobacco sector, Industrial Engineering has three companies, and one company belongs to Beverages sector.

3.2 VARIABLE

This research uses WCM as an independent variable. We select the proxies for WCM in the context of previous literature. Deloof (2003) and Eljelly (2004) used CR, cash, ACP, ITORD, and APPD. We use OP and stock price as dependent variables. We use thirteen manufacturing sectors as control variables. If the company belongs to the Construction & Materials, Automobiles & Parts, General Industries, Forestry & Paper, Food Products, Households Goods, Personal Goods, Pharma & Biotech, Chemicals, Oil & Gas, Tobacco, Industrial Engineering, or Beverages Sectors then the dummy variable is 1, otherwise 0. Table 1 represents the variable measurements.

Table 1:	Variable measurement and abbreviations	
Variables	Measurement	Abbreviations
Operating profitability	Gross profit – Operating expenses	OP
Average stock price	The total daily Closing stock price of the company in	SP
	year t / Total number of working days in year t.	
Current ratio	Current assets /current liabilities	CR
Cash	Total cash in year t	Cash
Inventory turnover in days.	Inventory/Cost of goods sold *365.	ITORD
Average collection period in days.	Accounts receivable/Credit sales*365	ACP
Average payment period	Accounts payable/Credit purchases*365	APPD
Cash conversion cycle	ACP + ITORD - APPD	CCC

3.3 PEARSON CORRELATION ANALYSIS

Before the analysis, the data were checked for normal distribution. Data were not properly distributed. The log transformation is applied for OP and SP. To check for multicollinearity, the Pearson Correlation was applied to Models #1 and #2. The Pearson Correlation results are reported in Tables 2 and 3. The Pearson results for Model #1 show that CR, S1, S2, and S4 are negatively correlated with operating profitability providing preliminary support for Hypothesis 1. Cash, APP, CC, S5 and S13 are positively correlated with operating profitability. The Pearson results for model 2 reveal that CR, INTOR, ACP, S5, S6 and S9 have a positive correlation with the stock price which initially supports Hypothesis 2. APP and S13 has a positive correlation with the stock price. Models #1 and #2 (Tables 2 and 3) indicate that there is no serious multicollinearity problem. After the Pearson Correlation, we then ran a univariate regression for Model #1 and #2. Correlation does not show the proper multicollinearity issue. The variance inflation factor confirms the multicollinearity problem. VIF is applied for checking the robustness of the results.

Table 2: Model #1 Pearson (Correlation
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Variable	Op	CR	Cash	INTOR	ACP	APP	CCC	S1	S2	S 3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
Ор	1.00																			
CR	10	1.00																		
Cash	.03	.08	1.00																	
INTOR	.10	.01	.02	1.00																
ACP	06	.33	.07	06	1.00															
APP	.08	.05	.19	.42	.19	1.00														
CCC	.09	.36	.08	.48	.35	.04	1.00													
S1	02	.43	.07	.03	33	.01	38	1.00												
S2	04	.01	.05	.04	21	06	04	09	1.00											
S3	26	.10	.12	.14	.06	.05	.11	.12	.05	1.00										
S4	04	.17	08	.05	.13	01	.12	08	03	04	1.00									
S5	.07	12	19	11	16	11	02	16	07	08	06	1.00								
S6	16	.17	.18	.06	.05	.03	01	.07	.03	.04	.02	.05	1.00							
S7	26	.09	.01	04	.11	13	.04	11	05	06	04	08	03	1.00						
S8	15	.21	.05	.11	02	08	.16	.09	.04	.05	.03	.07	.03	05	1.00					
S9	04	06	.20	.09	.05	08	.17	10	04	05	04	07	03	05	05	1.00				
S10	.34	.28	.19	21	.39	03	.18	19	08	11	07	14	06	09	08	09	1.00			
S11	.16	.03	.19	.25	29	.22	.07	08	03	04	03	07	03	04	03	04	08	1.00		
S12	.23	.01	.13	06	19	08	06	09	03	05	.04	06	03	05	04	04	08	4	1.00	
S13	.09	.08	.17	.21	.19	.59	.17	05	02	03	02	03	01	02	02	02	0.04	02	02	1.00

Notes. Dependent variable, OP indicates operating profitability of the company in year t.

CR, cash, INTOR, ACP, APP, CCC represent, respectively, current ratio, cash in year t, inventory turnover ratio, average collection period, average payment period, cash conversion cycle. S1 to S13 represent, respectively, Construction & Materials, Automobiles & Parts, General Industries, Forestry & Paper, Food Products, Household Goods, Personal Goods, Pharma & Bio-tech, Chemicals, Oil & Gas, Tobacco, Industrial Engineering, Beverages sectors.

Тя	hle	3.	Model	#2	Pearson	Correlation
		•••	Triouci		I Cui bon	Continuiton

Variable	SP	CR	Cash	INTOR	ACP	APP	CCC	S1	S2	S 3	S4	S 5	S6	S7	S8	S 9	S10	S11	S12	S13
SP	1.00																			
CR	.06	1.00																		
Cash	.17	.07	1.00																	
INTOR	.06	01	.03	1.00																
ACP	.02	.31	.02	09	1.00															
APP	06	.03	.20	.40	.10	1.00														
CCC	03	.33	09	.44	.40	.041	1.00													
S1	02	43	.08	01	31	.01	33	1.00												
S2	12	.05	.06	.05	21	06	03	09	1.00											
S 3	16	.11	11	.14	.05	.05	.11	12	.05	1.00										
S4	26	.18	09	.06	.12	01	.12	08	04	04	1.00									
S5	.05	12	22	11	13	11	02	16	07	08	06	1.00								
S6	.06	17	18	.06	.05	.04	01	07	.03	04	03	05	1.00							
S7	.05	.09	.01	04	.11	13	.04	11	05	06	04	08	03	1.00						
S8	08	.20	.05	.05	.08	09	.17	12	05	06	04	08	04	06	1.00					
S9	.07	06	.20	.09	.05	08	.16	11	04	05	04	07	03	.05	05	1.00				
S10	15	.28	.19	21	.36	02	.17	19	08	11	07	14	06	09	11	09	1.00			
S11	09	.01	.20	.26	39	.25	04	08	04	05	03	06	03	04	04	04	08	1.00		
S12	26	.03	.13	06	19	07	06	09	04	05	.03	06	03	05	04	04	08	04	1.00	
S13	04	.09	.17	.21	.18	.58	.17	05	02	03	02	03	01	01	02	02	0.04	02	02	1.00

Notes. The dependent variable, SP indicates the average stock price of the company in year t.

4. RESULT AND FINDINGS

4.1 MODEL #1: WORKING CAPITAL IMPACT ON NET OPERATING PROFITABILITY

Figure 1 describes that the Beverages sector indicates the maximum mean and highest standard deviation, but Pharma & Biotech sector shows the lowest mean and highest standard deviation. Forestry & Paper has the lowest SD. Next, we analyze the WCM and profitability by following the regression Equation (1). For detail of variables (see Table 1). The regression results are presented in Table 4.

$$y = \alpha + b1(CR) + b2(Cash) + b3(ITORD) + b4(ACP) + b5(APP) + b6(CCC) + \varepsilon$$
(1),

symbols α , *b*1, *b*2, *b*3, *b*4, *b*5, *b*6 are to be determined from the regression and ε represents the error term.



Figure 1: Mean and Standard Deviation of Model #1.

Table 4 shows that cash is positively significant at the 1% level. It means that cash has a positive impact on OP. If cash increases, then OP in the manufacturing sector also increases. The CR is negatively significant and the APPD is positively significant at the 10% level. It means that the current ratio has a negative relationship and the APPD has a positive relationship with OP. Construction & Materials, Automobiles & Parts, Forestry & Paper, Pharma & Biotech, Chemicals & Food Products are all negatively significant at the 1% level. WCM decreases the OP in these sectors. If the WC components increase in these sectors, then the OP of the firm will decrease. If WC components decrease in these sectors, then the OP of the firm will increase. The findings related to the current ratio, Construction & Materials, Automobiles & Parts, Forestry & Paper, Food Products, Personal Goods, Pharma & Biotech and Chemicals sectors support the first hypothesis.

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Variables	В	S.E.	t	р
Intercept	17.25	1.24	13.88	0.00
#CR	-0.18	0.11	-1.67	0.09*
Cash	0.00	0.00	2.43	0.01**
ITORD	-0.02	0.01	-1.54	0.12
ACP	-0.02	0.01	-1.15	0.25
APPD	0.02	0.01	1.77	0.07*
CCCD	0.02	0.01	1.63	0.10
Construction & Materials	-2.24	1.44	-2.76	0.00***
Automobiles & Parts	-4.32	1.23	-3.49	0.00***
General Industries	-0.73	1.22	-059	0.55
Forestry & Paper	-4.13	1.47	-2.80	0.01**
Food Products	-2.52	1.23	-2.05	0.04**
Household Goods	0.24	1.48	0.163	0.87
Personal Goods	-2.10	1.23	-1.70	0.09*
Pharma & Bio-tech	-5.48	1.31	-4.18	0.00***
Chemicals	-4.83	1.24	-3.90	0.00^{***}
Oil & Gas	-1.31	1.14	-1.14	0.25
Tobacco	-1.99	1.29	-1.54	0.12
Industrial Engineering	-2.25	1.59	-1.40	0.16
Beverages	0^{b}			

Table 4:	Working	capital	and profi	tability.
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Notes. "*, **, *** "represent significance at the 10%, 5 % and 1% levels, respectively"

a. "Dependent variable" –Net operating profitability

b. "R Squared" = 0.348 ("Adjusted R Squared" =0.310)

4.2 MODEL #2: WORKING CAPITAL AND STOCK PRICE

Figure 2 shows that Food Products indicates the highest mean and SD. Tobacco has the

minimum mean and a maximum SD. Next, we analyze the WCM and stock price by following the regression Equation (2). The regression results are presented in Table 5.





 $y = \alpha + b1(CR) + b2(Cash) + b3(ITORD) + b4(ACP) + b5(APP) + b6(CCC) + \varepsilon$ (2)

Variables	В	S.E	t	р
CONST	4.85	0.54	8.95	0.00
CR	0.09	0.04	1.98	0.04**
Cash	0.35	0.10	1.33	0.18
ITORD	0.01	0.01	1.72	0.08*
ACP	0.01	0.01	1.84	0.06*
APPD	-0.01	0.01	-2.06	0.04**
CCCD	-0.01	0.01	-1.87	0.06*
Construction & Materials	-1.20	0.53	-2.27	0.02**
Automobiles & Parts	-0.40	0.54	-0.75	0.45
General Industries	-0.35	0.53	-0.65	0.51
Forestry & Paper	-0.68	0.64	-1.05	0.29
Food Producer	1.66	0.54	3.09	0.00***
Households Goods	0.32	0.63	0.50	0.61
Personal Goods	-0.38	0.54	-0.70	0.48
Pharma & Bio-tech	-0.17	0.57	-0.28	0.77
Chemicals	-1.42	0.54	-2.63	0.00***
Oil & Gas	-0.17	0.50	-0.33	0.73
Tobacco	-1.70	0.56	-3.05	0.02**
Industrial Engineering	0.30	0.70	0.43	0.66
Beverages	0^{b}			

Table 5: WC and SP

*Notes.**, **, *** "represent significance at the 10%, 5 % and 1% levels, respectively" "Dependent variable": Stock price "R Squared" = 0.454 ("Adjusted R Squared" =0.424)

Table 5 shows that the CR is positively significant with the stock price at the 5% level. A high CR shows the financial strength of the firm. Investors collect financial information for investing in companies. If companies are financially strong, then more investors invest in these companies and the SP of the companies increases. The average payment period is negatively significant, with the stock price at the 5% level. If the APPD increases then the SP of the firm decreases and if the APPD decreases then the SP increases. The ITORD and ACP have a positive effect at the 10% significance level. If inventory turnover in days and ACP in days increases then the SP of the company increases. The CCC is negatively significant at the 10% level. If the CCC in days increases then the SP of the company increases, if the CCC in days decreases then the SP of the company increases. The CCC is Materials and Tobacco sectors show negatively significant

relationships with SP at a 5% level. The Food Products sector is positive and the Chemicals sector is negatively significant at the 1% level. It means that WC components have a positive relationship with OP in the Food Products sector and a negative relationship in the Chemicals sector.

The findings of the CR, INTORD, ACP, APPD, and CCC in the Construction & Materials, Food Products, Chemicals and Tobacco sectors support the second hypothesis.

4.3 ROBUSTNESS TESTS

To check the robustness of the results, we use the variance inflation factor (VIF). It is used when there is a strong linear relationship with predictor variables. If the value of VIF exceeds 4, it warrants investigation for multicollinearity. If the value of VIF is more than 10, it indicates that there is a serious problem of multicollinearity. The results listed in Table 6 highlight that all the values lie below four, so there is no concern with multicollinearity for Models 1 and 2.

l able 6:	variance infl	ation I	actor.	
Variables	Model1 (VIF)	1/VIF	Model2 (VIF)	1/VIF
CR	1.63	0.61	1.60	0.63
Cash	1.63	0.62	1.63	0.61
ITORD	1.80	0.56	2.36	0.42
ACP	2.32	0.43	2.74	0.37
APPD	2.33	0.43	2.62	0.38
CCC	2.28	0.44	2.70	0.37
Construction & Materials	2.21	0.45	2.20	0.45
Automobiles & Parts	1.38	0.73	1.41	0.71
General Industries	1.29	0.77	1.29	0.77
Forestry & Paper	1.16	0.86	1.19	0.84
Food Products	1.55	0.65	1.55	0.64
Household Goods	1.14	0.87	1.14	0.88
Personal Goods	1.24	0.81	1.27	0.79
Pharma & Bio-tech	1.38	0.73	1.42	0.70
Chemicals	1.48	0.67	1.48	0.68
Oil & Gas	1.94	0.52	1.91	0.52
Tobacco	1.71	0.58	1.40	0.71
Industrial Engineering	1.42	0.70	2.02	0.50
Beverages	1.23	0.81	1.84	0.54
Mean VIF	1.64		1.78	

Table 6: Variance inflation factor.

Notes. Model 1 Dependent variable Op represents Operating profitability. Model 2 "Dependent variable "SP represents a stock price.

"CR, cash, INTOR, ACP, APP, CCC represent the respectively current ratio, cash in year t, inventory turnover ratio, average collection period, average payment period, cash conversion cycle".

5. DISCUSSION

The recent study develops the association among WCM, profitability and the stock price of companies. The findings of the study suggest that cash has a positive impact on OP. Prior studies discussed the relationship in different manners. For example, Afza and Nazir (2007) investigate the negative association among WC components such as CR and profitability. Mathuva (2015) finds that cash has a positive association with the profitability of companies. It means if cash increases, then OP in the manufacturing sector also increases. In the sector-wise analysis, findings suggest that the Construction & Materials, Automobiles & Parts, Forestry & Paper, Pharma & Biotech, Chemicals and Food Products sectors all see negative impacts on OP. These results are in line with prior literature. For example, Afza and Nazir (2007) and "Rahman" find a negative association between WC and profitability. It means WC decreases the OP in these sectors. If WC components increase in these sectors, then the OP of the firm will increase.

In the Food Products and Beverages sectors, WC has a positive effect on the SP. If the CR rises, then the SP of the company will also increase. Financial managers in these sectors should maintain maximum CR to increase the stock price of their companies. A high CR shows the financial strength of the companies. The Construction & Materials, Automobiles & Parts, Forestry & Paper and Food Products sectors all experience the negative impact of WC on OP. Financial managers should maintain a minimum CR to increase the OP of their companies. They should avail themselves of short-term loans for manufacturing to enhance the operating profitability of their companies. The Construction & Materials, Chemicals and Tobacco sectors all experience the negative impact of WC on SP. Financial managers should maintain a maximum CR to increase the SP of their companies. A high CR shows the financial strength of the companies. When investors collect a company's financial information, if a company has strong financial information, then more investors will be interested in investing in this company. An APPD has a negative impact on the SP of the company. If companies have less than APPD, then their stock price will increase, showing the financial strength of the company. Financial managers should maintain less than APPD to increase stock prices for their companies.

6. CONCLUSION

WCM plays a significant role in every manufacturing organization. This research objective is to analyze the impact of WC on profitability and SP. The findings of this study reveal that the CR has a positive impact on SP and the APPD has a negative impact on the stock price. The findings of this study suggest that WCM in some sectors has a positive impact and some sectors have a negative impact on SP. Financial managers should maintain minimum current ratios for increasing the OP of their companies. They should avail themselves of short term loans for manufacturing; then they can enhance the operating profitability of their companies. Financial managers should maintain lower than average payment periods for increasing the SP of their companies.

7. AVAILABILITY OF DATA AND MATERIAL

Data can be provided upon contacting the corresponding author.

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^{*}Corresponding author (N. Khan). Tel: +923219728450. Email: noheed_khan@hotmail.com ©2020 International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies. Volume 11 No.13 ISSN 2228-9860 eISSN 1906-9642 CODEN: ITJEA8 Paper ID:11A13U http://TUENGR.COM/V11/11A13U.pdf DOI: 10.14456/ITJEMAST.2020.267

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Dr. Noheed Khan is an Assistant Professor in Government College University Faisalabad (GCUF), Pakistan. He has completed his PhD in Business Administration from Beijing Institute of Technology, Beijing, China in 2018. His research is related to Corporate Governance, FDI, and others.



Dr. Muhammad Bilal is a Researcher/Trainer in the field of Qualitative and Quantitative data analysis. He received his BS (CS) degree from PMAS-UAAR, Pakistan. He continued his MS/PhD study at Iqra University Islamabad Campus Pakistan where he obtained his PhD in Business Administration (Finance). Dr. Bilal's interests involve Risk Management and Capital Budgeting in Financial Institutions.



Dr. Imran Riaz Malik is an Associate Professor of Finance at Iqra University Islamabad Campus. He earned his PhD (Finance) degree from Institute of Management Sciences, Peshawar, Pakistan. His interests involve Financial Risk Management and Financial Econometrics.



Abdul Rauf Kashif is a PhD Scholar at Iqra University Islamabad Campus. He got an MS (Finance) degree from Iqra University Islamabad Campus Pakistan. His current interests involve Risk Management and Portfolio Management.



Abdul Rehman Sajid is a PhD Scholar at Iqra University Islamabad Campus. He holds an MS (Finance) degree from Iqra University Islamabad Campus Pakistan. His current interests involve Islamic Finance and Credit Management.