

Impact of Working Capital Management on Profitability: A Case Study on Pharmaceutical Companies of Bangladesh

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Abstract—This study is a modest endeavor to find out the effects of working capital management (WCM) on the profitability of pharmaceutical companies in Bangladesh. 9 pharmaceutical companies listed with Dhaka Stock Exchange (DSE) have been selected for the period of 2001-15. Return on asset (ROA), return of equity (ROE) and earning per share (EPS) have been used as the measures of profitability and average collection period (ACP), average payment period (APP), inventory conversion period (ICP), cash conversion cycle (CCC), and investment in marketable securities (INV) served as the representatives of working capital management. In correlation analysis, negative correlations are found among average collection period, inventory conversion period, cash conversion cycle, investment in marketable securities, and return on asset; inventory conversion period, cash conversion cycle, average payment period, and return of equity; and inventory conversion period, cash conversion cycle, investment in marketable securities, and earning per share. In regression analysis, at 5% significance level, significant negative relationships are observed between return on asset and average collection period, inventory conversion period, and cash conversion cycle; return of equity and average payment period; earning per share and average collection period and average payment period where significant positive relationships are seen between average payment period and return on asset; and cash conversion cycle and return of equity. Therefore, this research concludes that efficient working capital management is critical for the profitability of firms and financial managers can create value for their shareholders by implementation of effective working capital management policy.

Index Terms—Working capital management, profitability, cash conversion cycle, Bangladesh.

I. INTRODUCTION

Working Capital Management (WCM) is a very significant yet highly neglected function performed by financial managers for making the companies competitive in the market. At present, management of working capital is the most pertinent thing in the business world that differentiates one company from another. Cash, one of the very essential components of current assets, is considered as the life blood of business. But,

most of the companies prove to be inefficient in managing cash properly.

Working Capital Management deals with the management of current assets (CA) and current liabilities (CL) along with the measures to finance them efficiently. Usually, a company owns half of its total asset as current assets. Both too much and too less current assets are detrimental for the profitability of the firms. Again, the firms face struggle in managing business operations competently because of inadequate current assets [2]. Basing on these concepts, there are two types of working capital i.e. gross working capital (GWC) and net working capital (NWC). Gross working capital is the total amount of current assets whereas net working capital is the surplus current assets that is the net of current liabilities. Moreover, working capital can also be segregated into another two categories i.e. fixed (permanent) and temporary working capital. Permanent working capital is needed to carry out the regular business operations and temporary working capital is needed to shore up the changes in production and sales activities. Temporary working capital has two variants i.e. seasonal and special working capital. Efficient working capital refers to maintaining the optimum level of current assets and current liabilities to ensure maximum profit for the organizations [1].

In the post independence period of Bangladesh, the pharmaceutical industry had a limited number of multinational companies. However, the industry has been expanded 65 times and has reached from an export volume of BDT 1730 million to BDT 113 billion. Nowadays, people have become increasingly aware of the health issues that have increased the demand of the pharmaceutical products made in Bangladesh. In 2000, there were only 173 licensed allopathic drug-manufacturing companies, but now it has turned into a total of 300. Currently, the pharmaceutical companies of Bangladesh produce around 1500 different types of medications under 22,000 different brands of drugs. It has become a self-sufficient industry that can meet 98% of the local demand. This industry has put significant contribution in reducing unemployment problem in Bangladesh by employing 1,15,000 workers during 2013-14 with a growth rate of around 11.37%. IMS Health Report has estimated a local market of BDT 160 billion by 2018. However, the industry is still importing raw materials from other countries. In this situation, efficient management of working capital can promote this industry's profitability. Therefore, this paper aims to find out the association between working capital management and

Manuscript received December 9, 2017; revised February 27, 2018.

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profitability of the listed pharmaceutical companies in Dhaka Stock Exchange (DSE).

II. LITERATURE REVIEW

Number of studies have been conducted on the exploration of working capital management and profitability relationship. Deloof [3] conducted a study on Belgian non-financial firms for testing the relationship between working capital management (WCM) and profitability. Through correlation and regression analysis, he found a negative relationship of gross operating income with the number of days of account receivables, inventories and accounts payables and concluded that profitability of non-financial firms of Belgium can be improved by reducing the number of days of accounts receivable and inventories.

Padachi [4] studied the trend of working capital and its effect on performance in Mauritian firms by analyzing 58 small manufacturing firms for 1998- 2003. He used return on total asset (ROTA) as profitability measure and concluded the negative association of profitability with inventories days and accounts receivables. Raheman and Nasr [5] analyzed 94 firms listed with Karachi Stock Exchange (KSE) for 1999-2004. They used average collection period, inventory turnover in days, average payment period, cash conversion cycle and current ratio as working capital management variables and net operating profitability as profitability variable and identified the existence of strong negative relationship between working capital management and profitability in Pakistani firms.

To explore working capital management and profitability relationship, Falope and Ajilore [6] studied 50 non-financials firms of Nigeria for 1996-2005. They concluded significant negative relationship between return on assets and average collection period, inventory turnover in days, average payment period and cash conversion cycle. They also included that working capital management between larger and small firms has no significant variation. In another study, Zariyawati, Annuar, Taufiq, and Rahim [7] explored this relationship by considering 148 firms for 1996-2006 and found a strong negative significant relationship between cash conversion cycle and firm profitability in Malaysia.

Gill, Biger, and Mathur [8] considered 88 American firms listed with New York Stock Exchange (NYSE) for the period of 2005-07. They used cash conversion cycle (CCC) as a proxy of working capital and gross operating profit as a measure of profitability and found a significant positive relationship among them. Therefore, they opined that it is possible to generate more profit by managing CCC effectively. On the other hand, Ali and Hassan [9] studied 37 Swedish companies listed with OMX Stockholm Stock Exchange for 2004-08. They used CCC and gross profit as the measures of working capital policy and profitability respectively and concluded that there exists no relationship between working capital policy and profitability.

Gul *et al.* [10] studied the dynamics of working capital management and performance for small and medium

enterprises (SMEs) of Pakistan by incorporating 55 SMEs for 2006-12. They considered return on assets (ROA) as profitability indicator and number of days account receivable (ACP), cash conversion cycle (CCC), number of day's inventory (INV) and number of days account payable (APP) were used as working capital management indicator. Through regression analysis, they have found that APP has a positive relationship with profitability whereas ACP, INV, and CCC have negative relationships.

In India, Singhania, Sharma, and Rohit [11] by studying 82 firms listed with Bombay Stock Exchange for 2005-12 concluded a negative relationship between cash conversion cycle and profitability measures i.e. return on assets (ROA), net operating profit (NOP), and gross operating profit (GOP). In another work, Hoang [12] studied the relationship by incorporating 98 manufacturing firms listed with Ho Chi Minh City Stock Exchange for 2009-14. By using Pearson's correlation and fixed effects multiple regression analysis, he concluded significant negative relationships between cash conversion cycle, net trade cycle, average collection period, average inventory period, average payment period, and return on assets in Vietnam.

In perspective of South Africa, Garg and Gumbochuma [13] explored the working capital management and profitability relationship by incorporating 17 companies of the general retail sector listed with Johannesburg Stock exchange (JSE) for 2004-13. They have used cash conversion cycle as a representative of working capital and operating profit margin as a measure of profitability and found a negative relationship between working capital and profitability. Mehtap [14] also studied this relationship for 110 manufacturing companies of Istanbul for 2005-14 and found a significant negative relationship of profitability measured by Operating profit margin with cash conversion cycle, average collection period and days of inventory outstanding. But, a significant positive relationship is found with average payment period.

Mbawuni *et al.* [15] incorporated 5 petroleum retail firms of Ghana for 2008-13 and concluded that return on assets (ROA) has significant relationship with average days payable but insignificant relationship with cash conversion cycle, average days inventory and average days receivables. Kasozi [16] studied the association for 69 manufacturing firms of South Africa for 2007-16 and concluded a negative significant relationship between the average collection period, average payment period, and profitability but a positive statistically significant relationship with the number of days in inventory.

In Malaysia, Jakpar *et al.* [17] analyzed the association between working capital management and profitability based on 164 manufacturing firms for the period of 2007-11. Through discriminatory panel regression and Pearson correlation, they found significant positive relationship between average collection period, inventory conversion period and profitability i.e. return on assets (ROA) but cash conversion cycle is found to be insignificantly and negatively associated with profitability. Sarwat *et al.* [18] studied 18 cement companies listed with Karachi Stocks Exchange (KSE) for 2007-11. They have used ROA as profitability indicator

and through panel regression found that ROA has significant positive relationship with assets turnover ratio (ATO) and current ratio (CR) while the relation is insignificant for inventory, account receivable and payable for cement industry of Pakistan.

Dalayeen [19] studied three real estate companies of Jordan for 2000-15 and used return on capital employed (ROCE) as profitability measure and current ratio (CR), inventory turnover ratio (ITR), and debtors turnover ratio (DTR) as working capital measures. This study has concluded a significant impact of working capital on profitability. Lamptey *et al.* [20] studied this relationship by considering 400 SMEs of Ghana for 2011-15. Through ordinary least square regression they have found significant negative relation of profitability (average return on capital employed) with cash conversion period, account receivable days and inventory turnover days where positive relation is identified with account payable days.

In Bangladesh perspective, Quayyum [21] studied 28 Dhaka Stock Exchange (DSE) listed firms of cement, food, pharmaceuticals, and engineering industry for 2005-09 and concluded that except for food industry all other selected industries have a significant level of relationship between the profitability indicators i.e. return on asset, net profit margin and working capital measures i.e. receivables collection period, inventory turnover period, payable deferral period, cash conversion cycle, current ratio, and quick ratio.

Amin and Islam [22] studied the association by considering 15 fuel and power companies listed with DSE for 2007-11. They used time interest ratio (TIE), quick ratio (QR), cash conversion cycle (CCC), accounts receivables collection period (ARCP), accounts payable payment period (APP), inventory processing period (IPP), cash to current liability (CCL), cash to sales (CTS) ratios and net working capital (NWC) turnover as measures of working capital efficiency and return on assets (ROA) and net profit margin (NPM) as profitability measures. They concluded that TIE have significant positive relationship with ROA while QR, IPP, NWC turnover have significant negative relationships but other measures have no significant relationship with ROA. On the other hand, CCL, APP have significant positive impact on NPM and ARCP has a significant negative impact while others have insignificant impact.

Hamid and Akhi [23] explored this relationship by considering 10 pharmaceuticals and chemicals companies listed with DSE for the period of 2005-14 and found no significant relationship between working capital management measured by current ratio, quick ratio, and working capital ratio and profitability measured by return on assets, return on equity, and return on capital employed. Karim *et al.* [24] examined the relationship for 2 pharmaceuticals companies of Bangladesh i.e. Square Pharmaceuticals Limited and Beximco Pharmaceuticals Limited and found the existence of significant relationship between working capital management and profitability for both firms.

Through the review of relevant and contemporary literatures,

it can be understood that the endeavor to study the relationship between working capital management and profitability measured by return on assets (ROA), return on equity (ROE) and earnings per share (EPS) is new and exclusive in the context of Bangladesh. In addition, a few researches are available on the relationship between working capital management and profitability in the pharmaceutical industry. For this, the focus of this study has been fixed in determining the relationship between working capital management and profitability which would help the financial managers to prioritize their efforts in managing working capital well.

III. OBJECTIVE

The objective of this study is to find out the relationship between working capital management and profitability in Pharmaceuticals industry of Bangladesh.

IV. METHODOLOGY

A. Sample

Both qualitative and quantitative methods have been used in this research. Currently, 12 Pharmaceutical companies are listed under Pharmaceuticals and Chemicals sector in Dhaka Stock Exchange (DSE). So, the population size was 12. From these, this study has incorporated 9 pharmaceutical companies of varying sizes. The variation in the sizes has been considered to construct a reliable representation of the pharmaceutical industry.

B. Data Collection

Data have been collected from the annual reports of the sample companies for the period of 2001-2015. Those annual reports were obtained from DSE library. Two exceptions were made for the recently listed firms because of the limited availability of historical data. To maintain the integrity and accuracy of the models, financial data for Beacon Pharmaceuticals Limited was considered for the period of 2009-2015. Another exception was made for Central Pharmaceuticals Limited, for which only the data from 2011-2015 was considered.

C. Variables

To explore the relationship, 12 variables have been selected from the domain of working capital management and profitability indicators. Here, widely used profitability indicators i.e. return on assets (ROA), return on equity (ROE), and earnings per share (EPS) were used and to represent working capital management average collection period (ACP), inventory conversion period (ICP), average payment period (APP), cash conversion cycle (CCC), and investment in marketable securities (INV) were considered. In addition, sales growth (GROWTH), firm leverage (DR), current ratio (CR), and firm size (SIZE) were incorporated as control variables. The variables are depicted in Table I.

TABLE I: VARIABLES OF THE STUDY

Variable	Measurement
ROA	Earnings before Interest & Taxes/Total Assets
ROE	Earnings before Interest & Taxes / (Total Asset – Total Liabilities)
EPS	(Net Income-Preferred Dividends) / Weighted Average Number of Outstanding Common Shares
ACP	(Accounts Receivable / Net Sales) *365
ICP	(Inventory / Cost of Goods Sold) *365
APP	(Accounts Payable / Cost of Goods Sold) *365
CCC	ACP + ICP - APP
INV	Total investment in marketable securities in Taka
GROWTH	(Salest– Salest-1) / Salest-1
DR	Total Liabilities / Total Assets
CR	Current Assets / Current Liabilities
SIZE	Natural Logarithm of Total Assets

D. Conceptual Framework

The conceptual framework that has been used to understand and explain the relationship between working capital management and profitability of the pharmaceutical companies in Bangladesh is shown in Fig. 1.

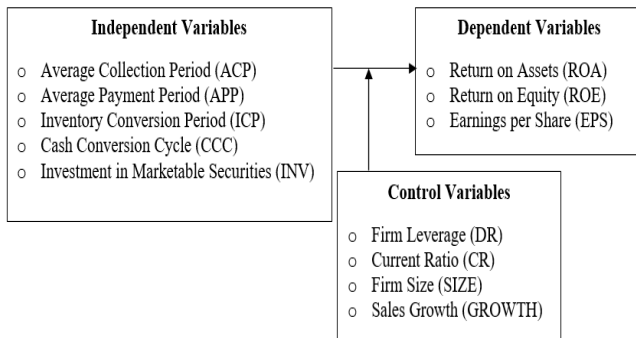


Fig. 1. Conceptual framework of the study.

E. Model Specifications

To study the working capital management and profitability relationship following model is used.

$$Y_{it} = \alpha_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \dots + \beta_n X_{nit} + e_{it}$$

where,

- Y represents the dependent variable;
- α_0 is the intercept;
- $\beta_1, \beta_2, \beta_3, \dots, \beta_n$ are regression coefficients;
- $X_{1it}, X_{2it}, X_{3it}, \dots, X_{nit}$ are independent variables;
- e_{it} is the estimation error.

Here, profitability indicators i.e. ROA, ROE, and EPS have been used as dependent variables and working capital management indicators i.e. ACP, ICP, APP, CCC and INV have been used as independent variables. The working capital management indicators have been individually regressed against the profitability indicators separately along with the control variables i.e. GROWTH, DR, CR, and SIZE. So, against 3 profitability indicators with 5 independent variables total 15 regressions have been run to explore the relationship. The regression models can be shown in simple form as

$$ROA = f(ACP, ICP, APP, CCC, INV, GROWTH, DR, CR, SIZE)$$

$$ROA_{it} = \alpha_0 + \beta_1 ACP_{it} / ICP_{it} / APP_{it} / CCC_{it} / INV_{it} + \beta_2 GROWTH_{it} + \beta_3 DR_{it} + \beta_4 CR_{it} + \beta_5 SIZE_{it} + e_{it}$$

$$ROE = f(ACP, ICP, APP, CCC, INV, GROWTH, DR, CR, SIZE)$$

$$ROE_{it} = \alpha_0 + \beta_1 ACP_{it} / ICP_{it} / APP_{it} / CCC_{it} / INV_{it} + \beta_2 GROWTH_{it} + \beta_3 DR_{it} + \beta_4 CR_{it} + \beta_5 SIZE_{it} + e_{it}$$

$$EPS = f(ACP, ICP, APP, CCC, INV, GROWTH, DR, CR, SIZE)$$

$$EPS_{it} = \alpha_0 + \beta_1 ACP_{it} / ICP_{it} / APP_{it} / CCC_{it} / INV_{it} + \beta_2 GROWTH_{it} + \beta_3 DR_{it} + \beta_4 CR_{it} + \beta_5 SIZE_{it} + e_{it}$$

F. Hypotheses

The models stated above were used to test following 15 hypotheses developed in combination of different working capital measures and profitability measures. These hypotheses have been tested with appropriate testing tools and discussed in the relevant section. The hypotheses are-

- H_{O1} There is no significant relationship between ACP and profitability (ROA)
- H_{A1} There is significant relationship between ACP and profitability (ROA)
- H_{O2} There is no significant relationship between ICP and profitability (ROA)
- H_{A2} There is significant relationship between ICP and profitability (ROA)
- H_{O3} There is no significant relationship between APP and profitability (ROA)
- H_{A3} There is significant relationship between APP and profitability (ROA)
- H_{O4} There is no significant relationship between CCC and profitability (ROA)
- H_{A4} There is significant relationship between CCC and profitability (ROA)
- H_{O5} There is no significant relationship between INV and profitability (ROA)
- H_{A5} There is significant relationship between INV and profitability (ROA)
- H_{O6} There is no significant relationship between ACP and profitability (ROE)
- H_{A6} There is significant relationship between ACP and profitability (ROE)
- H_{O7} There is no significant relationship between ICP and profitability (ROE)
- H_{A7} There is significant relationship between ICP and profitability (ROE)
- H_{O8} There is no significant relationship between APP and profitability (ROE)
- H_{A8} There is significant relationship between APP and profitability (ROE)
- H_{O9} There is no significant relationship between CCC and profitability (ROE)
- H_{A9} There is significant relationship between CCC and profitability (ROE)
- H_{O10} There is no significant relationship between INV and profitability (ROE)
- H_{A10} There is significant relationship between INV and profitability (ROE)
- H_{O11} There is no significant relationship between ACP and profitability (EPS)
- H_{A11} There is significant relationship between ACP and profitability (EPS)
- H_{O12} There is no significant relationship between ICP and profitability (EPS)

H_{A12} There is significant relationship between ICP and profitability (EPS)

V. EMPIRICAL ANALYSIS

H_{O13} There is no significant relationship between APP and profitability (EPS)

H_{A13} There is significant relationship between APP and profitability (EPS)

H_{O14} There is no significant relationship between CCC and profitability (EPS)

H_{A14} There is significant relationship between CCC and profitability (EPS)

H_{O15} There is no significant relationship between INV and profitability (EPS)

H_{A15} There is significant relationship between INV and profitability (EPS)

A. Descriptive Statistics

Descriptive statistics of the variables are shown in table II. Return on assets (ROA) has showed impressive results with a mean of 22.16% and a standard deviation of 9.75%. Return on equity (ROE) has scored a little lower because of the entrance of a lot of new firms in the market during 2000 to 2010 and incurring losses as well debts. A more reliable measure would be the median, which is closer to 13.9%. Earnings per share (EPS) is showing a mean of Tk. 49.03 which means that on average the companies are generating earnings of Tk. 49.03 per share.

TABLE II: DESCRIPTIVE STATISTICS

Variables	Mean	Median	Std. Deviation	Minimum	Maximum
ROA	0.2216	0.2177	0.0975	0.0465	0.3776
ROE	0.0383	0.1390	1.2413	-3.8450	1.8686
EPS	49.0302	58.5429	26.9829	12.3089	85.0950
ACP	60.3574	59.3339	13.4013	42.7447	94.2614
ICP	208.7354	198.1831	37.2402	146.0903	283.4727
APP	54.2404	52.0239	11.5860	37.4751	80.6081
CCC	214.8523	217.9636	39.1170	120.8947	271.2951
INV	264344544	160038526	270353389	30349889	1082694387
GROWTH	0.1565	0.1829	0.0840	0.0163	0.2825
DR	0.8658	0.7964	0.2331	0.4224	1.3654
CR	1.5810	1.4737	0.4349	1.1794	2.9026
SIZE	20.6748	20.4832	0.6768	19.5734	21.7606

Source: Primary

Average collection period (ACP) on an average, is 60.4 days with a standard deviation of 13.4 days. Inventory conversion period (ICP) averages at 208.8 days with a standard deviation of 37.2 days. Average payment period (APP) has a mean of 54.24 days with a standard deviation of 11.6 days. The aforementioned variables have make CCC, on average, 214.9 days long with a standard deviation of 39.1 days. Investment in marketable securities (INV) clocks in at BDT 264,344,544 with a standard deviation of 270,353,389 which has been reflected in the minimum and maximum values. A median of 160,038,256 that is lower than both measures including the standard deviation, shows the general firm's reluctance in maintaining a high-volume investment in marketing securities. Companies have an average growth rate (GROWTH) of 15.65% with a standard deviation of 8.4%. Firm leverage (DR) is 86.58% with a standard deviation of 23.3%. Mean current ratio (CR) is 1.58 times with a standard deviation of 0.43 times and mean for natural logarithm of total assets (SIZE) is 20.67 with standard deviation of 0.68.

B. Correlation Analysis

Table III shows that ROA is negatively correlated with ACP, ICP, CCC, and INV but positively related to APP. All control variables i.e. GROWTH, DR, CR, and SIZE are positively

related to ROA. On the other hand, ROE is negatively related to ICP, CCC, APP, and INV but has a positive relationship with ACP. Unlike ROA, GROWTH, DR, CR, and SIZE are negatively related to ROE. Again, EPS is positively related to ACP and APP but negatively related to ICP, CCC, and INV. Among the control variables, GROWTH and SIZE is negatively correlated with EPS but positively correlated with DR and CR.

C. Regression Analysis

To identify the cause-effect relationship between working capital management and profitability in pharmaceutical companies of Bangladesh regression analysis have been conducted by considering working capital management (WCM) indicators i.e. ACP, ICP, APP, CCC, and INV as independent variables and profitability indicators i.e. ROA, ROE, and EPS as dependent variables. GROWTH, DR, CR, and SIZE served as control variables. Table IV shows the summary regression analysis result of WCM indicators with ROA. Model 1 to Model 5 considered single WCM indicators subsequently. It can be observed that ACP, ICP, CCC, and INV have negative coefficients with ROA and APP has positive coefficients. But, at 5% significant level, only ACP, ICP, APP, and CCC are found significant.

TABLE III: PEARSON CORRELATION ANALYSIS

	ROA	ROE	EPS	ACP	ICP	APP	CCC	INV	GROWTH	DR	CR	SIZE
ROA	1											
ROE	.154	1										
EPS	.426	.065	1									
ACP	-.100	.222	.082	1								
ICP	-.193	-.250	-.214	-.163	1							
APP	.444	-.293	.394	-.412	.157	1						
CCC	-.349	-.076	-.292	.309	.850*	-.288	1					
INV	-.057	-.087	-.552*	-.248	.170	.003	.076	1				
GROWTH	.394	-.081	-.050	-.377	.241	.532*	-.057	.296	1			

	ROA	ROE	EPS	ACP	ICP	APP	CCC	INV	GROWTH	DR	CR	SIZE
DR	.157	-.178	.350	-.026	-.215	.236	-.283	-.482	-.174	1		
CR	.444	-.127	.394	-.034	-.140	.236	-.215	-.194	-.045	.253	1	
SIZE	.279	-.009	-.308	-.530*	.401	.378	.088	.609*	.581*	-.162	-.181	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed)

Table V highlights the regression result of WCM indicators against ROE. Like the earlier, here, Model 6 to Model 10 considered single WCM indicators separately. APP and INV have negative coefficients with ROE and ACP, ICP and CCC have positive relationships. But, only the relationships of APP and CCC with ROE are significant among these five.

Table VI summarizes the regression result of WCM indicators i.e. ACP, ICP, APP, CCC, INV against EPS. Here also Model 11 to Model 15 considered individual WCM indicators. Here, ICP and CCC have positive coefficients against EPS and ACP, APP, and INV have negative. At 5% level of significance, the relationships of ACP and APP are found significant.

TABLE IV: REGRESSION ANALYSIS WITH ROA

	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value
Constant	.790	.027	.131	.668	.130	.659	.303	.292	.237	.460
ACP	-.001	.005**								
ICP			-.213	.017						
APP					.294	.001***				
CCC							-.330	.000***		
INV									-.006	.951
GROWTH	.133	.124	.163	.060	.152	.073*	.137	.099	.173	.058
DR	.343	.002**	.481	.000***	.393	.000***	.422	.000***	.443	.000***
CR	-.031	.730	-.012	.894	.032	.714	-.004	.962	-.009	.921
SIZE	-.214	.064	.012	.911	-.038	.700	-.039	.685	-.054	.620
Adjusted R2	.252		.236		.276		.304		.192	
F-Value	8.222		7.603		9.141		10.352		6.072	
D-W Statistic	1.166		1.130		1.201		1.266		1.033	
Firm Years	115		115		115		115		115	

*, ** & *** denote significance level at 10%, 5%, and 1% levels respectively

TABLE V: REGRESSION ANALYSIS WITH ROE

	Model 6		Model 7		Model 8		Model 9		Model 10	
	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value
Constant	-1.5	.755	3.026	.735	4.097	.294	2.144	.592	1.735	.681
ACP	.179	.115								
ICP			.068	.508						
APP					-.334	.001***				
CCC							.216	.028		
INV									-.084	.427
GROWTH	.003	.974	-.019	.853	.001	.992	.001	.990	-.005	.965
DR	-.036	.782	-.112	.371	-.044	.710	-.087	.474	-.085	.495

	Model 6		Model 7		Model 8		Model 9		Model 10	
CR	.067	.514	.054	.600	.007	.945	.050	.621	.050	.628
SIZE	.027	.840	-.096	.432	-.095	.397	-.085	.459	-.046	.707
Adjusted R2	-.010		-.031		.073		.013		-.029	
F-Value	.786		.363		2.683		1.284		.402	
D-W Statistic	1.943		1.875		2.021		1.949		1.882	
Firm Years	115		115		115		115		115	

*, ** & *** denote significance level at 10%, 5%, and 1% levels respectively

TABLE VI: REGRESSION ANALYSIS WITH EPS

	Model 11		Model 12		Model 13		Model 14		Model 15	
	β	p-value	β	p-value	β	p-value	β	p-value	β	p-value
Constant	79.195	.557	-42.965	.728	-12.518	.920	-55.213	.656	-111.216	.381
ACP	-.244	.021								
ICP			.155	.121						
APP					-.201	.050				
CCC							.129	.190		
INV									-.181	.083
GROWTH	.080	.414	.099	.317	.112	.258	.103	.300	.136	.183
DR	-.178	.161	-.134	.289	-.090	.473	-.111	.376	-.080	.527
CR	-.135	.188	-.143	.169	-.187	.075	-.157	.133	-.157	.129
SIZE	.022	.862	.095	.436	.101	.397	.116	.336	.189	.128
Adjusted R2	.079		.050		.064		.043		.056	
F-Value	2.746		2.081		2.405		1.927		2.213	
D-W Statistic	.479		.493		.518		.487		.542	
Firm Years	115		115		115		115		115	

*, ** & *** denote significance level at 10%, 5%, and 1% levels respectively

VI. RESULT OF HYPOTHESES TESTING

The summary results of hypothesis testing are shown in table VII. At 5% significance level, it can be observed that there are evidences of significant relationships between ROA

and ACP, ICP, APP, CCC; ROE and APP, CCC; EPS and ACP, APP, and INV. On the other hand, insignificant relationships are detected for ROA and INV; ROE and ACP, ICP, INV; and EPS and ICP, CCC.

TABLE VII: SUMMARY OF HYPOTHESES TESTING

Hypotheses		Decisions	Level of Significance (P-value)
HO1	There is no significant relationship between ACP and profitability (ROA)	Rejected	0.005
HA1	There is significant relationship between ACP and profitability (ROA)	Accepted	
HO2	There is no significant relationship between ICP and profitability (ROA)	Rejected	0.017
HA2	There is significant relationship between ICP and profitability (ROA)	Accepted	
HO3	There is no significant relationship between APP and profitability (ROA)	Rejected	0.001
HA3	There is significant relationship between APP and profitability (ROA)	Accepted	
HO4	There is no significant relationship between CCC and profitability (ROA)	Rejected	0.000
HA4	There is significant relationship between CCC and profitability (ROA)	Accepted	
HO5	There is no significant relationship between INV and profitability (ROA)	Accepted	0.951
HA5	There is significant relationship between INV and profitability (ROA)	Rejected	
HO6	There is no significant relationship between ACP and profitability (ROE)	Accepted	0.115
HA6	There is significant relationship between ACP and profitability (ROE)	Rejected	
HO7	There is no significant relationship between ICP and profitability (ROE)	Accepted	0.508
HA7	There is significant relationship between ICP and profitability (ROE)	Rejected	
HO8	There is no significant relationship between APP and profitability (ROE)	Rejected	0.001
HA8	There is significant relationship between APP and profitability (ROE)	Accepted	
HO9	There is no significant relationship between CCC and profitability (ROE)	Rejected	0.028

HA9	There is significant relationship between CCC and profitability (ROE)	Accepted	
HO10	There is no significant relationship between INV and profitability (ROE)	Accepted	0.427
HA10	There is significant relationship between INV and profitability (ROE)	Rejected	
HO11	There is no significant relationship between ACP and profitability (EPS)	Rejected	0.021
HA11	There is significant relationship between ACP and profitability (EPS)	Accepted	
HO12	There is no significant relationship between ICP and profitability (EPS)	Accepted	0.121
HA12	There is significant relationship between ICP and profitability (EPS)	Rejected	
HO13	There is no significant relationship between APP and profitability (EPS)	Rejected	0.050
HA13	There is significant relationship between APP and profitability (EPS)	Accepted	
HO14	There is no significant relationship between CCC and profitability (EPS)	Accepted	0.190
HA14	There is significant relationship between CCC and profitability (EPS)	Rejected	
HO15	There is no significant relationship between INV and profitability (EPS)	Accepted	0.083
HA15	There is significant relationship between INV and profitability (EPS)	Rejected	

VII. CONCLUSION AND RECOMMENDATIONS

This study tried to explore the dynamics of working capital management and profitability by incorporating 9 pharmaceuticals companies of Bangladesh for 2001-15. Though descriptive, correlation, and regression analysis, at 5% significance level, this study has found significant positive relationship of APP with ROA and significant negative relationship with ACP, ICP, and CCC [4], [6], [10], [11], [12], [16]. With ROE, only APP has shown significant negative and CCC has depicted significant positive relationship. On the other hand, ACP and APP have significant negative relationships with EPS.

It can be stated that efficiency of working capital management is very significant to ensure profitability. If the average collection period, inventory conversion period, and cash conversion cycle can be reduced to a reasonable level with improvement of average payment period, greater profitability of the firms can be attained. In general, the variables of working capital management may have some apparent short-term impacts but do not have enough momentum in the long run. However, among five independent variables, maximum number (80%) of variables has shown significant relationships with ROA which is a more stable variable comparing to ROE and EPS. Therefore, it can be concluded that financial managers will be able to create value for their shareholders through the efficient management of working capital by exploiting the relationships between profitability and working capital variables. For this, companies need to dedicate considerable amount of resources in developing effective working capital management policy.

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