

Working Capital Management and its affect on firm's profitability and liquidity: In Other food sector of (KSE) Karachi Stock Exchange

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Abstract

This paper aims to extend the Rehman and Nasr finding regarding Working capital management and its affect on profitability and liquidity of Pakistani firms. For the purpose of our analyses we have been selected the other food sector and selected the data from 2006-2010 of 18 companies of this sector listed on Karachi Stock Exchange. For this purpose we examine the effect of different variables of working capital management like Average collection period, average payment period, inventory turnover in days, cash conversion cycle, debt ratio, financial asset to total asset ratio, current ratio and net operating profitability. We have used pooled least square regression and common effect model. We found that there is significant positive affect of working capital management on profitability and liquidity of the firms. Size of the firm and financial asset to total asset ratio have significant positive effect on firm's profitability while average collection period has significant negative effect on firm's profitability. Size of firm and cash conversion cycle has significant positive effect on firm's liquidity.

Key Words: WCM, ACP, ARP, CCC, DR, FATA, CR, NOP, Pooled Least Square Regression, Common Effect Model.

1. Introduction:-

In the past, the corporate financial management literature has only focused on the study of long term financial assets however many studies have studied the topics related to investments, mutual funds performance, earning per share, firm's financial structure and valuation of the firms. Meanwhile, the short-term assets of the firm that have maturity less than a year in the form of current assets are also account for significant proportion of total assets on the balance sheet of a firm.

The firm' performance mainly depends on the way its working capital has been managed. A firm should must managed effectively and efficiently its working capital if it is unable to manage efficiently and effectively of its working capital than this may result in not only reduction in profitability but May also lead to severe result like financial crisis for a firm. Then it's a matter of greater concern and importance that how can firms manage their working capital in a way that will lead to ultimate prosperity of a firm.

Each and every business needs short-run financial resources to finance daily operations. Investment in form of cash, payments to debtor and for inventories of a firm etc., is called working capital. Net working capital is the net difference of current asset and current liabilities. We can further elaborate it in these wording:

Net working capital = Account receivables + inventory – account payables

“Working capital is equal to the value of raw materials, work in progress, finished goods inventories and Trade debts (Account receivable) less accounts payable”.

Many researchers have searched for the effect of working capital management on profitability in the past three decades after the work done by Verlyn and Laughlin (1980) both highlighted the topic of “cash conversion cycle” which is the important variable of working capital. They explained that although working capital management received less attention of scholars in the literature than longer-term investment and financing decisions, it occupied the major portion of a financial manager's attention and time.

Working Capital Management is very important topic of financial management because it directly relates and affect on a firm's liquidity and profitability. It is simply the difference of current asset and current liability. Working capital management is important for several reasons. Current asset accounts for half of firm's total asset so it is very important to manage them in such a way that leads to profitability. A firm with too short current asset can bear difficulties in maintaining its day to day operations (Horne and Wachowicz2000). We have two main concerns for which Working capital management is necessary. Manage current asset and current liabilities in a manner that will not only reduce the risk of inability to meet day to day expenses but also can avoid excessive investment in these asset that may result in loss in form of opportunity cost. Current asset are short term investment that are subject to continually convert into cash and with regard to current liabilities. Firms are also responsible for paying off their obligations on the prescribed dates.

A firm should have an optimal level of working capital. The ultimate objective of a corporate firm is to increase profitability. Huge level of inventory and smooth credit policies leads to high level of sales volume. High inventory eliminate the risk of stock out and generous credit policies allow firm's customer to pay after assessing the quality of product. Account payable is another component of working capital. According to (Rehman & Nasr 2007) a firm may delay in payments to supplier to assess the quality of good purchase, inexpensive and a valuable source of financing but on the other hand it may be expensive for a firm if supplier grant discount on early payments.

Cash conversion cycle is also an important measure of working capital management. Main contribution of Working Capital is toward Cash conversion cycle (CCC). Larger investment required for longer CCC. Cash conversion cycle can significantly affect profitability, a longer cash conversion cycle can increase firm's profitability while cash conversion cycle can also lead to decrease profitability if cost of CCC increase from its benefit. The purpose of our study is to examine the effect of working capital management on profitability in the OTHER FOOD PRODUCTS (N.E.S) of Pakistan except sugar industries.

The research work is focus on effect of working capital management on profitability for a Sample of 18 Pakistani firm in Food products sector. Very few researcher take into account this sector, sector is neglected in the past research so we want to identify WCM affects on this sector's profitability and liquidity. Many researchers tried to explore this important aspect of firm's structure but still much of work has to be done in this particular area because of its importance.

2. Historical Review of Literature:

Here is the overview of past research that has been done by different scholars in the past. There is too little research in this field of study. However we tried to present a clear image of research in this particular field.

Rehman and Nasr (2007) examined the relationship of cash conversion cycle, Average payment period, Average collection period, Inventory turnover in days, on profitability and liquidity of Pakistani firms. For this purpose they collected data of 94 Pakistani firms listed on Karachi stock exchange for a period of 6 year 1999 to

2004. For analysis of their data they use the following model Pearson's correlation, and regression analysis {Pooled least square, general least square and cross section weight models). They concluded that there is significantly negative relationship between firm's operation profit and inventory turnover in days, cash conversion cycle and average payment period.

Samiloglu and Demirgunes (2008) explore the effect of working capital management and profitability on Turkish firms. For this purpose they used the data of manufacturing firms listed on Istanbul stock Exchange (ISE) from the period of 1998-2007. They used multiple regression models for analyzing the data. Their study revealed that there is significant relationship between working capital indicators and profitability. Further their study showed that account receivable period, account payable period and leverage significantly and negatively affect profitability. Their study reveals that profit can be increased by shorting the account receivable and account payable periods.

A. Danulețiu (2010) examined the relationship between working capital management and profitability of companies from Alba County. They used Pearson correlation model and sample of 20 company's financial statement from period of 2004-08. They used different variables of working capital and divide firms on the basis of offensive and defensive policy. They conclude that there is negative relationship between working indicators and profitability.

A. Gill et al., (2010) seek the relationship of working capital management on gross operating profit of 88 American firms listed on New York stock exchange for a period of three years from 2005-07. They use regression analysis and cash conversion cycle as a proxy of working capital and concluded that a firm with slow collection of account receivable is negatively correlated with profitability. However they found that account payable in days and inventory turnover in days has no significant affect on firm's profitability.

Phuong et al: (2010) made an attempt to show the significance relationship between firm's profitability, cash conversion cycle and its components. For this purpose they collect secondary data from Vietnam stock market for a period of 2006-2008. They use correlation analysis and multiple regression analysis. Their study also revealed negative relationship as many before. They found that there is negative relationship between firms profitability with cash conversion cycle, number of days account receivable and number of days inventory handled.

The impact of overall working capital on profitability in different sector has been examined by Rahman et al.,(2011) their study covers a period of 10 years from 1998 to 2007 for 204 manufacturing and trading firms listed at KSE and classified them in 24 sectors. They identified different sector that are performing well in term of working capital management and certain sector that is laggard in managing working capital. They conclude that All Textile sectors are among the laggard sectors in terms of working capital management measures.

The main findings of the study are: Oil and Gas Exploration & Refinery and Oil and Gas Marketing sectors have the shortest Cash Conversion Cycle and Net Trade Cycle because these sectors do not manufacture goods so they have shortest CCC and NTC. All textile sectors are among laggard while power generation sector is efficient in term of profitability. Pharmaceutical, cable and electric goods have problems and inefficient in their inventory and collection policy so they are also among laggard sector. Automobile parts and pharmaceutical goods have been positive relation between cash conversion and profitability because they have longest cash conversion cycle and excessive sales. Sugar and Vanaspati & Allied sectors are efficient in managing working capital but they are laggard in term of profitability.

Shahid (2011) explores the effect of working capital management and profitability of textile sector in Pakistan. His study covers the periods of 6 years from 2000-06 of 160 textile firms for this purpose. He used the following model for this purpose of ordinary least squares model and a fixed effect model. He concluded the following results that longer the cash conversion cycle higher will be the profit and through regression analyses

he also concluded that average payable and average receivable have a significant economic impact on ROA (return on asset). He also ranked different textile organization on the basis of different variables of working capital management.

A. Saghir et al.; (Dec 2011) attempted to show the significance of working capital management on profitability of 60 textile firms listed on Karachi stock exchange for a period of 5 years from 2001-2006. They used Pearson approach and ANOVA to examine the relationship of WCM and profitability. Their study concluded that there is significant negative relationship between cash conversion cycle and profitability. If a firm has longer account receivable and payable in days than it'll be less profitable.

V. Mojtabehzadeh et al .;(2011) conduct a study on the relationship of WCM and profitability. For the statistical purpose they collect data of 101 firms during the period of 2004-08 listed on Tehran stock Exchange. For supporting their hypothesis they use Pearson correlation and Multivariate regression Analysis. Their findings also showed a negative relationship between cash conversion cycle, A/R in days and A/P in days with profitability. However their study also concludes that Average Period of inventory retention has no significant relation or affect on Profitability.

3. Objective of study:-

The main objective of our study is to reveal the effect of working capital management on the profitability and liquidity for other food sector in Pakistan because heavy investments have been made in the working capital in this sector and this sector is also neglected in research in the past. So it is very important to have knowledge of how different indicators of working capital affecting the profitability in this sector and to know the basic short coming of not managing working capital in the efficient manner. Our study aims to build significant relationship between different components of working capital management and profitability. It is also aim of our research to find out relationship between profitability and size of firms in this sector and to draw the conclusion and findings about affects of working capital management, profitability and liquidity.

4. Significance:-

The research is significant in regard to other food sector N.E.S because data that has been gathered and analyzed under great precautions and we tried our level best to minimize chances of errors during this process. All the data on which statistical toll has been run is available from Stock Exchange. We hope that in coming future our research will help out corporations coming under this sector to manage their working capital. This will prove a roadmap and firms can enhance their performance regarding short-term assets.

5. Data sampling and methodology:-

We aim to contribute towards a very important topic of financial management which is Working Capital Management in reference to other food sector N.E.S of Pakistani firms listed at Karachi Stock Exchange. We have gathered 6 year data from 2006-2010. Here we will seek out the effect of working capital management of profitability and liquidity. The following sections will discuss the data patterns, statistical method applied by us and our findings regarding this sector.

I. Gathering of data:-

For the purpose of effect of working capital we gathered secondary data from Karachi Stock Exchange (KSE), past publications, annual reports and from internet. We used more recent data that were available from period of 2006-2010 for the purpose of our study. Our data is limited to 2010 because we have certain restrictions in extracting more recent data so due to this reason we are limited to that period.

II. Variable

The research takes into account the key variables that possibly can affect and has influence on Working capital management. Choice and selection of variables is influence by the past research and different study conducted by different scholars on Working capital management.

All the variables stated below have been used to test and examine the analyses of hypothesis of our study. These include dependent, independent and some control variables.

Average Collection Period {ACP} it is approximately time that business takes to received payments owed by it. It is an independent variable that used as a proxy for collection policy. It is calculated by dividing account receivable by net credit sale and multiplying with 365.

$$= \text{Account receivable} / \text{Net credit sale} * 365$$

Net Operating Profitability {NOP} it is a dependent variable and a measure of net operating profitability of a firm. It is calculated as operating income plus depreciation and divided by total asset minus financial assets.

$$= \text{Operating Income} + \text{depreciation} / \text{Total Asset} - \text{financial asset}$$

Inventory Turnover in days {ITD} it is a ratio that determine how many times inventory of a company is sold and replaced over a given period of time. It is an independent variable and used as a proxy for inventory policy of a firm. It is calculated by dividing inventory with (CGS) cost of goods sold and multiplying with 365.

$$= \text{Inventory} / \text{CGS} * 365$$

Average Payment Period {APP} it is the short term liquidity measure that explain the rate at which company paid off to its suppliers. It is an independent variables and used as a payment of proxy policy. It is calculated by dividing account payable by purchase and multiplying with 365.

$$= \text{Account payables} / \text{purchase} * 365$$

Cash Conversion Cycle {CCC} it is a measure that explain amount of time needed to convert company resources into cash flows. It is another independent variable and used as a comprehensive measure of Working capital management (WCM). It is measured by Inventory turnover in days and Average collection period and subtracting average payment period from it.

$$= \text{ITID} + \text{ACP} - \text{APP}$$

Current Ratio {CR} it is a measure of company liquidity or ability to payoff short-term obligations. It is calculated by dividing current asset by current liabilities. It is a dependent variable in our study.

$$= \text{Current Asset} / \text{Current liabilities}$$

Furthermore we also use variables like Sale size or volume {Log of Sale (LOS)} is used as a proxy for leverage, Debt ratio (DR) calculated by dividing Total Debt(Short-term + long-term) by Total Assets and (FATA) ratio of financial asset to total asset are used in our study as the independent variables

All the above variables have somewhat relationship that affects firm's operating profitability and liquidity.

III. Hypothesis:-

The purpose of our study is to explain and examine the affect of working capital on profitability and liquidity. Past study enable us to build two possible set of hypothesis (Null hypothesis H_0 and alternative hypothesis) to pool out our findings.

Hypothesis # 1:-

H_{11} = There exist significant positive relationship among working capital management and profitability among firm under food sector. Corporation that is more efficient in managing their working capital are more profitable and vice versa.

H_{01} = There is no relationship among working capital management and profitability.

Hypothesis # 2:-

H_{12} = Firms working capital management has possible positive effect on firm's liquidity for firms under this heading.

H_{02} = There is no relationship among firm's working capital management and liquidity.

IV. Results of Statistical Tests:-

For the purpose of our analysis we run Pooled least square regression along with common, fix and random effect. All the results are given below and interpreted in much of detail and ease that a common person can easily understand these concepts.

Pooled least squares (Regression):-

We used pooled least squares regression to check the significance of our model; we use three types of regression common, fix and random methods to check the significance of effect of working capital on profitability and liquidity. We use Net operating profitability (NOP) and Current ratio (CR) as dependent variables separately and apply all above mentioned regression types separately on both of them. However we used Average collection period (ACP), Average payment period (AOP), Cash conversion cycle (CCC), Inventory turnover in days (ITID), Ratio of Financial asset to total asset (FATA), Debt Ratio (DR) and Log of sale (LOS) as independent variables.

This regression model has been build using pooled least square with no weights.

A. Net Operating Profitability: - (As independent variable)

Following model has been used for Net operating profitability:-

$$NOP = a + \beta_1 (FATA) + \beta_2 (ACP) + \beta_3 (CCC) + \beta_4 (APP) + \beta_5 (DR) + \beta_6 (LOS) + \beta_7 (ITID) + \epsilon$$

Where NOP = Net operating profitability

FATA = Ratio of financial asset to total asset

ACP = Average collection period

CCC = Cash conversion cycle

APP = Average collection period
 DR = Debt ratio
 LOS = log of sale (size of firm)
 ITID = Inventory turnover in days

1. Common pool Regression:-

The components of net operating profitability have been analyzed and investigated for 18 firms. Different coefficients are established for the selected variables.

Method: Pooled Least Squares

Variable	Coefficient	t-Statistic	Prob.
C	-0.269500	-1.481316	0.1417
FATA?	1.413200	4.699059	0.0000
DR?	0.001190	1.420419	0.1587
CCC?	-0.000351	-0.455529	0.6497
ITID?	-0.000512	-0.832215	0.4073
ACP?	-0.003638	-2.317459	0.0226
LOS?	0.058495	4.687326	0.0000
APP?	-0.000227	-0.297534	0.7667
R-squared	0.375072		
Adjusted R-squared	0.330435		
F-statistic	8.402595		
Prob(F-statistic)	0.000000		

The finding of this regression reveals that ratio of financial asset to total asset is positively correlated and accurately significant which means that as the ratio of financial asset to total asset increased firm's profitability will raise. So firm's should increased their financial assets. Firm size is also accurately significant and positively affecting firm's profit which means that firm with greater sales volume are more profitable in this sector. Whereas average collection period is also significant but negatively correlated which means that as the firm's collection period increase firm will bear loss so firms in this sector should try to reduce their collection period. Common regression F-statistic shows that overall model is significant and Adjusted R² which is the coefficient of determination and also shows the % of variance in dependent variable due to independent variable is 37%. Overall this model is significant.

2. Fix pool Regression:-

Method: - Pooled least square

Variable	Coefficient	t-Statistic	Prob.
FATA?	1.146840	3.972011	0.0002
DR?	0.000148	0.099878	0.9207

CCC?	0.000149	0.233164	0.8162
ITID?	-0.001551	-1.927021	0.0575
ACP?	0.002363	0.847987	0.3989
LOS?	0.101281	2.415605	0.0180
APP?	-1.440006	-0.002424	0.9981
R-squared	0.790877		
Adjusted R-squared	0.728914		
F-statistic	51.05522		
Prob(F-statistic)	0.000000		

Under this model (fixed pooled least square regression model) is also ratio of financial asset to total asset ratio and size of firm both are significant and also affecting positively to net operating profit of firms is significant.. R-square value is also 79% which means that all independent variables have 79% affect on profitability which shows the greater significance of this model. This is also a valid model.

3. Random pool regression:-

Method: - Least square model

Variable	Coefficient	t-Statistic	Prob.
C	-0.353917	-1.434214	0.1547
FATA?	1.020735	4.092133	0.0001
DR?	0.001063	0.980064	0.3295
CCC?	8.72E-05	0.141650	0.8876
ITID?	-0.000918	-1.763465	0.0809
ACP?	-0.001117	-0.617130	0.5386
LOS?	0.065098	3.576145	0.0005
APP?	1.170005	0.020141	0.9840
R-squared	0.727391		
Adjusted R-squared	0.707919		

Under this model also p-value of Financial asset to total asset and log of sale is significant and here also affecting positively to net operating profitability while all other variables are insignificant regarding this model. All independent variables have 72% affect on net operating profitability.

B. Current Ratio: - (As independent variable)

Following model has been used for current ratio which has been used as a measure of liquidity:-

$$CR = a + \beta_1 (FATA) + \beta_2 (ACP) + \beta_3 (CCC) + \beta_4 (APP) + \beta_5 (DR) + \beta_6 (LOS) + \beta_7 (ITID) + \varepsilon$$

Where CR = Current Ratio

FATA = Ratio of financial asset to total asset

ACP = Average collection period

CCC = Cash conversion cycle

APP = Average collection period

DR = Debt ratio

LOS = log of sale (size of firm)

ITID = Inventory turnover in days

1) Common pool Regression:-

Method: - Pooled least square

Variable	Coefficient	t-Statistic	Prob.
C	0.059964	0.223813	0.8234
FATA?	-0.590590	-1.348965	0.1805
DR?	-0.000154	-0.125664	0.9003
CCC?	0.002297	2.047143	0.0433
ITID?	-0.000525	-0.585388	0.5596
ACP?	-0.001809	-0.791187	0.4308
LOS?	0.082455	4.494658	0.0000
APP?	0.001458	1.311502	0.1928
R-squared	0.396213		
Adjusted R-squared	0.352641		
F-statistic	9.093234		
Prob(F-statistic)	0.000000		

Common pool regression for dependent variable Current ratio which is a measure of liquidity of firms shows that this is valid model and significant. Here only Log of sale of firm is significant which means that firms with huge or greater sales volume are more efficient regarding liquidity of asset in the food sector while all other independent variable are insignificant. All these dependent variables have 40% affect on firm’s liquidity.

2) Fix pool regression:-

Method: - Pooled least square

Variable	Coefficient	t-Statistic	Prob.
FATA?	-0.834419	-2.722065	0.0080
DR?	0.001194	0.636256	0.5264
CCC?	-0.000705	-1.040670	0.3012
ITID?	-0.001281	-1.498506	0.1379
ACP?	0.001889	0.638749	0.5248
LOS?	0.054493	1.223938	0.2246
APP?	-0.000922	-1.459568	0.1483
R-squared	0.892736		
Adjusted R-squared	0.860557		
F-statistic	110.9710		
Prob(F-statistic)	0.000000		

Under fix pool regression model to check the firm’s liquidity is a significant model. Under this regression model ratio of financial asset to total asset (FATA) is significant and negatively correlated which means that as firm will increase its financial asset the firm’s ability of liquidation will decrease. We can further collaborate that firm’s liquidity and profitability has inverse relationship between each other because increment of financial asset leads to higher profitability on one hand while this increment lead to decrease the liquidation ability of a firms. All independent variables have 90% affect on firm’s liquidity.

3) Random pool regression:-

Method: - Pooled least square

Variable	Coefficient	t-Statistic	Prob.
C	0.285932	0.767631	0.4446
FATA?	-0.858607	-3.081548	0.0027
DR?	0.000279	0.182565	0.8555
CCC?	-0.000408	-0.622838	0.5349
ITID?	-0.001546	-2.447109	0.0162
ACP?	0.001436	0.605582	0.5462
LOS?	0.076198	2.752691	0.0071
APP?	-0.000695	-1.133840	0.2597
R-squared	0.870762		
Adjusted R-squared	0.861435		

Under the random least square model the ratio of financial asset to total asset (FATA) and inventory turnover in days (ITID) both are significant and negatively correlated to firm’s liquidity. Increase in firm’s financial asset relevant to total asset will decrease firm’s liquidity power and as the firm intend to increase its inventory holding days than the firm’s capacity of liquidity will decrease. However firm size is significant and positively correlated which means that firm’s with huge volume of sales has higher capacity of liquidity than low sales volume firm in this sector.

6. Conclusion:-

There has trend that heavy amount has been invested in working capital in most of corporations in Pakistan so it is important to manage working capital in most favorable manner. We have found that there is negative relationship between net operating profitability and inventory turnover in days, average collection period and cash conversion cycle. These result can further be elaborated in following words that financial manager can create profit for firms by reducing collection period to a minimum level. They can also create profit by managing inventory turnover days to possible minimum days and by reducing cash conversion cycle. Average payment period is also negatively correlated but its affect is very minor so we didn’t talk much about it.

As we relate our findings to our hypothesis no 1 we can judge that there is significant positive relationship between working capital management so our hypothesis (H₁₁) that there exist significant positive relationship among WCM and NOP is accepted while (H₀₁) that there is no relationship among working capital management and profitability is rejected on the basis of our findings.

We also found through analyses of our data that there is negative relationship between average collection period and liquidity so as the firm's collection period minimize firm's liquidity capacity will increase. We also find that average payment period and cash conversion cycle both has positive relationship with firm's liquidity so we can say that by managing working capital firm liquidity capacity will rises. Size of firm is also significant and positively correlated which means that as firm's sale increases firm's capacity of liquidity will automatically increase.

When we relate our findings about liquidity with our hypothesis we can make sense that firm's working capital management positively affecting liquidity we can say that (H₁₂) that firm's working capital management has possible positive effect on firm's liquidity is accepted and Null hypothesis is ultimately rejected.

The above findings will be more strengthened if firms affectively manage their working capital. If firms are able to manage more efficiently different components of working capital they will be more successful in terms of profitability and performance. Still much of worker has to be done for this dominant factor of capital structure.

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