Pollster j. acad.res. 03(01) 193-205, 2016
© Pollster Journal of Academic Research, Pollster Publications
ISSN: 2411-2259,2016, Vol (03), Issue (01)
www.pollsterpub.com

Impact of Working Capital on Profitability; A case of selected Auto Manufacturing Sector in Pakistan

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Abstract

This study paper is aimed to explore the affect of effective Working Capital Management on Profitability on selected auto mobile sector working in Pakistan and also listed in Karachi Stock Exchange. Further this paper has tried to find and nature of relation between Return on Assets and effective Working Capital Management. For this purpose established Liner Regression Analysis data techniques being employed by using E.Views-6 software. The correlation metrics reveals that all the variables have correlated with profitability. Accounts receivable turnover and debts to equity have significant correlation with ROA. As the profitability and liquidity has inverse relation same like this Cash Conversion Cycle and inventory turnover in time has negative correlation with ROA. The regression analysis results show that accounts receivable turnover and debts to equity has significant relation with return on assets or profitability. Other liquidity variables have negative association, which show if inventory and operating cycle quickly convert the material into cash it will affect positive otherwise negative.

Keywords: ROA, AR in Days, AR in Time, ITO in Days, ITO in Time, Cash Conversion Cycle, Regression, Granger Causality.

Introduction

The customary approach to corporate finance give a weight to the long-term financial decisions similar to the approach of capital budgeting technique and capital structure technique. The importance on WCM was developed over a past two decades (Lyroudi and Lazaridis 2000).The Working Capital can be analysis by two methods: they are dynamic and static. The analysis of liquidity ratio is called static method. Generally in this method teacher used current and quick ratios calculated from the Balance Sheet data of the firm. Cash Conversion Cycle s a vibrant technique for the measurement of the time between cash payment for raw materials and then receiving it from accounts receivable (Moss and Stine 1993, Lancaster, Stevens and Jennings 1999).As far as the dynamics of ongoing liquidity management is concerned, CCC combines both balance sheet and income statement data to measure liquidity with dimension of time (Jose et al., 1996).

The WCM theory is based on the conventional models of the CCC that is initiated by Richards and Laughlin (1980). It is a great measure to know that how fine a corporation is organizing its working capital (Nobanee et al. 2011). Gitman (1974) concluded that CCC is the most important aspect in WCM. In fact, it tells about the investment and credit decisions in the customer, inventory and suppliers, which show average number of days started from the date when the firm starts payments to its suppliers and the date when it begins to receive payments from its regulars.

Padachi (2006) analyzed the trends in the WCM and its influence on business performance for small manufacturers of Mauritius. He reported that firm's needs for working capital of change over time depending on the rate of creation of money and high internal investment in inventories and receivables led to reduced profitability.

Nazir and Afza (2008) studied that operating cycle, ROA, leverage and Tobin's are the features which significantly influence WC requirements in Pakistan, whereas different industries are following different WC requirements. The results are same as concluded by Nazir and Afza (2007).

The main purpose of this study is to look at the relationship between the ROA and Accounts receivable turnover, Accounts receivable in days, Inventory turnover in days, Inventory turnover in times operating cycle, CCC, debts to equity and Firm profitability. A sample of 03 firms of automobile industries was selected covering the period 2004-2013 for Pakistani non-financial firms listed on the Karachi Stock Exchange (KSE). Rest of the paper reviews the existing literature and presents the results.

Therefore, the main objectives of the current study are: to analyze working capital management performance of automobile manufacturing sectors by using different working capital management measures which include Cash Conversion Cycle, Receivable Turnover in Days, Inventory Turnover in Days, Payable Turnover in Days and Return on Total Assets and to compare the ranking of these 03 companies based on working capital management performance in order to sort out the similarities and differences.

Study Hypothesis

The purpose of this paper is to investigate relationship exists or not between effective working capital management and profitability of selected companies of automobiles sector working in Pakistan and also register with KSE-100 index. This study is also tried to find out the causal relation WCM and profitability.

Since the question remained answerable whether effective Working Capital Management have impact on the profitability on the organization or not. Some research thought have view point that the WCM has significant impact while other thought have view that there is no effect. In order to investigate the actual factors which may cause this study is being conducted.

Literature Review

Since last many decades optimal working capital management has been declared as vital part of the profitability of the firm. Working Capital has covered a significant portion of financial research. Like capital budgeting management most of the research teachers have investigated impact of working Capital management on the profitability of the firm in different aspects. Besides largest industrial and services industries working capital or cash management has play very imperative role for small industries because without cash they can't survive. (Peel, Wilson and Howorth,2000). According to the study conducted by Shin and Soenen (1998) and Deloof (2003) has been declared as pioneer study, the results of study concluded that working capital management has significant positive impact on corporate profitability. Therefore, auto mobile industry should address this issue very properly.

This study is being conducted to investigate the association between working capital and profitability of selected auto mobile Industries working in Pakistan. The working capital is consisting of three parts i.e.

- First, Accounts Receivable,
- Second, Accounts Payable and
- Third, Inventory.

From the accounting point of view Accounts Receivables are current assets and recorded in the assets side as a part of Balance Sheet from the finance point of view these are inflow of the firms. Accounts Receivable Management system is being enforced in the company when the firm has sold its product on credit basis. The Accounts payables are also being recorded in the credit side of Balance Sheet and known as current liabilities from the accounting point of view. Accounts Payables are called out flows from the Finance point of view. Accounts Payables Management system is being applicable when the firm has buying its material on credit basis. Inventory is also a part of Balance Sheet and recorded as current assets from the accounting point of view. Inventory management system is being enforced for recording revenue generating from its products sales. The standard for the measurement of better working capital management is known as "Cash Conversion Cycle". The Cash Conversion Cycle is being enforced by the firms to check the time span from disbursement to cash collection. The cash conversion cycle has consisted of the following components:

- Accounts Receivables in Days,
- Accounts Payables in Days ,and
- Inventory Turnover in Days

The cash conversion can be obtained from the following Formula:

(Accounts Receivable in Days+ Inventory Turnover in Days- Accounts Payable in Days).

Several research studies have been conducted on this topic having limited scope.

Eljelly (2004) has conducted a study on the subject "Liquidity-Profitability Trade off: An Empirical Investigation in an Emerging Market" and tried to find out the relationship between profitability and liquidity. The researcher has a sample size of 929 joint stock companies of Saudi Arabia. The researcher employed correlation and regression statistics for data analysis technique. As a result the researcher found significant negative association between the firm profitability and liquidity level. The variable size level of the firms has important effect on the profitability at the industry level.

Padachi (2006) has conducted a study on" Trends in Working Capital Management and its Impact on Firms 'Performance: An Analysis of Mauritian Small Manufacturing Firms". The researcher conducted a study on small manufacturing firms operating in five major groups which are registered and recognized as proprietary/private companies. The researcher employed the data analysis technique on 58 proprietary/private companies covering the period from 1998 to 2003.The researcher employed regression data analysis technique. The researcher takes inventories in days, accounts receivables in days, accounts payable in days and cash conversion cycle as key variables in his

research. The researcher found perfect significant association between working capital and profitability during imperial analysis. In the study of selected 05 industries the paper and printing industry has been found high score on the various components of working capital positively.

Lazaridis and Tryfonidis (2006) has concluded a cross sectional examination by employing correlation and regression tests on the sample size of selected 131 firms listed on the Athens Stock Exchange covering the period from 2001 to 2004. As results a data analysis the researcher found significant association between profitability and working capital.

Rajavathana (2013) has conducted a study on "Effects of working capital management on profitability of select automobile companies in India". The researcher conducted the study on selected two auto mobile industries named as Tata Motors Limited (TATA) and Mahindra and Mahindra Limited (M&M). The research teacher employed the study on secondary data covering the period of nine years started from the financial year 2003-04 and ended on 2011-12.The researcher applied only one technique of data analysis i.e. correlation. The study concluded that there is insignificant association between working capital and liquidity of both selected companies.

Rehman, Afza, Qayyum & Ahmed (2010) has conducted a study on "Working Capital Management and Corporate Performance of Manufacturing Sector in Pakistan". The researchers have conducted a study on 204 manufacturing companies listed in Karachi Stock Exchange which have been classified into different sectors. In this sector one of them is auto mobile sector. The researchers have analysis the data covering the period from 1998 to 2007. For analysis purpose the researchers had used secondary data collected from the financial statement of the companies. For analysis purpose the researchers have applied Descriptive statistics, correlation and Regression data technique. The researcher found that overall manufacturing sector the working capital of the selected firms have significant impact on their profitability and play vital role in creating value for shareholders.

Methodology

For the purpose to accomplish pre-determined set of objectives of the study, only liner regression techniques and data tests tool is applied. First and primary, to fulfill the study objectives descriptive statistics technique such as a mean, standard deviation, variance, etc are applied to reflect the nature and basic characteristics/behavior of the variables used in the analysis. ADF test is being used to find out the stationary or non stationary variables of data series. Inferential statistics technique is also being used to

inference about the results by using different ways of inferential statistics like Correlation matrix analysis which finds any strength of association between Return on assets and working capital management. Then**,** finally to see the two way relationship between variables by using granger causality test.

Data and Data Collection Source

For the purpose of study, the Secondary data was analyzed to dig out the relationship between exogenous variable and endogenous variable and their significance. The secondary data have been obtained from the company financial statement available on their website for the Financial Year from 2004 to 2013.
From auto mobile manufacturing Companies which are listed on Karachi Stock Exchange (KSE) represented the population of the study. Convenience sampling technique was applied for choice of the sample. A total of three companies i.e, M/s Suzuki Motors, Toyota and Honda covering manufacturing, among the KSE-100 index were selected as sample for this study.

Model Specification

The data of independent and dependent variable comprises the period over July 2004 to June 2013. The Linear regression model for evaluating the relationship between effective working capital management and profitability of selected auto mobile sector is shown below:

$$ROA=\alpha+\beta_i(ITOD)+\beta_{ii}(ITOT)+\beta_{ii}(ART)+\beta_{iv}(DOTE)+\beta_v(CCC)+\beta_{VI}(OPC)++\acute{\epsilon}$$

Where:

ROA= Return on Assets

ITOD= Inventory Turnover in Days

ITOT= Inventory Turnover in Times

ART= Accounts Receivable Turnover in Time

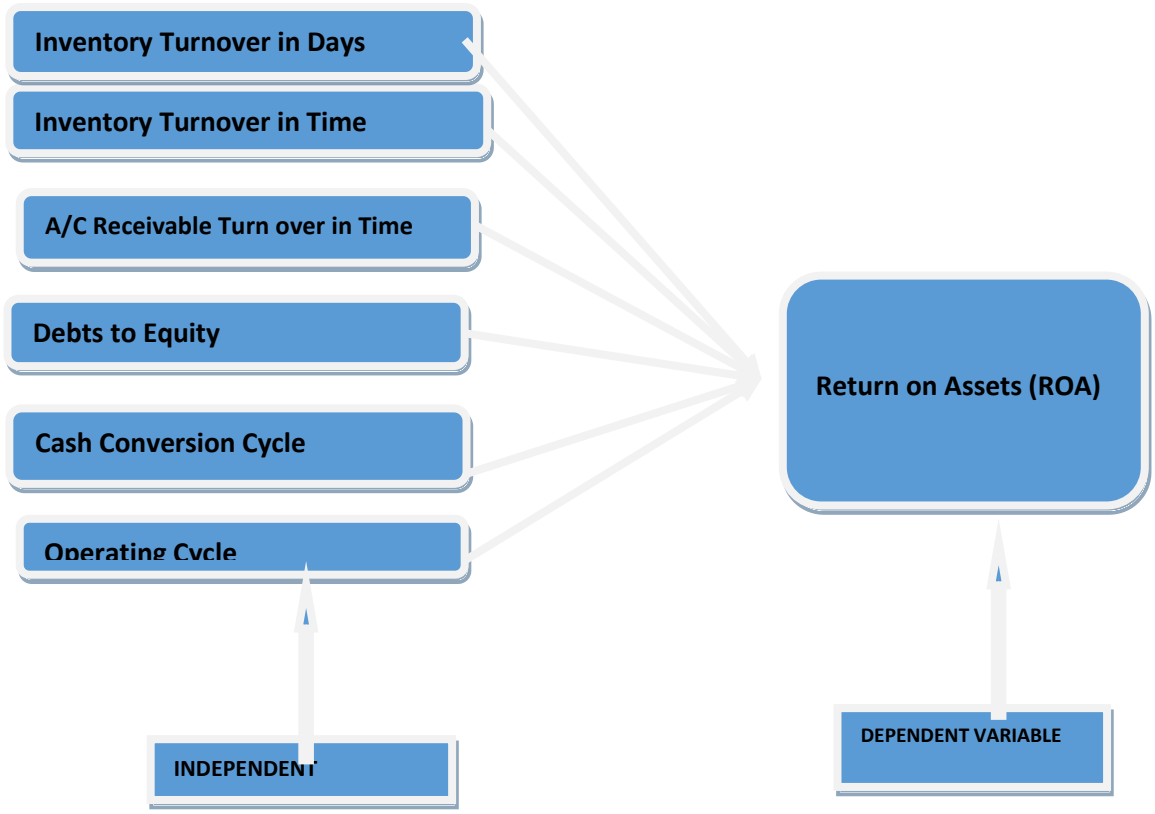
DTOE= Debts to Equity

CCC= Cash Conversion Cycle

OPC= Operating Cycle

$\acute{\epsilon}$ = Stochastic Variable or Error Term

Conceptual Framework:



Estimation

The descriptive statistics results are presented in table 4.01 in this research study for the purpose to see the behavior of data under study. Before evaluating data most researcher have applied descriptive statistics in their study simply to describe that what the data in study shows. The values of Mean, Median, Standard deviation, Skewness, Kurtosis, Jarque-Bera Test and Probability of all variables has been found out by employing the descriptive statistics data analysis techniques. The summary of results of all the variables are reflected in the underneath in table 4.01

Table 4.01: Descriptive Statistics of ROA

Test Name	ROA	ART	CCC	DTOE	ITOD	ITOT	OPC
Mean	2.510333	47.59267	36.93500	0.577667	43.46133	17.57833	49.53733
Median	1.720000	59.63000	23.72500	0.200000	47.46000	12.00500	49.97000
Maximum	13.25000	141.5000	99.36000	2.400000	98.00000	45.63000	100.2500

Minimum	0.350000	0.010000	-31.00000	0.000000	8.000000	3.700000	14.00000
Std. Dev.	2.836849	38.19619	34.00481	0.730520	29.22990	13.95681	26.56857
Skewness	2.790702	0.074673	0.233176	1.383108	0.184265	0.736109	0.214114
Kurtosis	9.841802	2.401719	2.039082	3.488296	1.691448	1.937031	1.996060
Jarque-Bera	97.45290	0.475306	1.426059	9.862978	2.310154	4.121661	1.489092
Probability	0.000000	0.788476	0.490157	0.007216	0.315033	0.127348	0.474950
Sum	75.31000	1427.780	1108.050	17.33000	1303.840	527.3500	1486.120
Sum Sq. Dev.	233.3837	42309.52	33533.48	15.47614	24777.22	5648.984	20470.77
Observations	30	30	30	30	30	30	30

The results of Descriptive statistics tabulated above reflect that the mean value of ROA is 2.510333which comparatively on very low side as compared to other variables except the value DTOE which is 0.577667. The mean values of ART, ITOD and OPC are 47.59267, 43.46133and 49.53733 respectively. It leads to significant variability in the data set. In other words, we can also say that these variables have high volatility as compared to other variables during the period of study i.e. 2004 to 2013. High volatility indicates higher risk. Standard Deviation of Return on Assets (ROA) is 2.836849 which are on very lower side as compared to other variables in the data set. It indicates that return on assets is very close to the mean value of the data (which is 2.510333) and has very narrow variation in the population sets of data. The accounts receivable turnover in time (ART) cash conversion cycle (CCC) and Operating cycle (OPC) have largest range as compared to other variables of data set. The standard deviation value of ART is 38.19619 the value of CCC is 34.00481 and the value of OPC is 26.56857 respectively. It leads that the mean values of these variables are not the finest value to describe the central tendency of these variables. A skewness measure indicates the level of non symmetry in the data set under study. From skewness of the data it reveals that the value is within the critical range i.e. 1.67 to 2.00, all the variables are positively skewed. This shows that the data set under study is asymmetrical. Kurtosis is a measure of the peakedness of the data. The kurtosis values of ROA are 9.841802 and DTOE is 3.488296 which are greater than 3, so these two variables are Leptokurtic distribution. From the result of kurtosis it is easily concluded that the data set of variables are normally distributed. By the results of Jarque-Bera test, it is established that no variables in the data sets are normally distributed since this is based on skewness or kurtosis tests. The P Values of all the variables in test conducted is less than or equal to 5%.

Correlation Matrix

The usual technique used for determining the relationship between two or more quantitative variables is correlation. The Correlation results quantify the strength of the linear relationship between a pair of variables. Before going ahead to the research, we first check the correlations between all the variables which are under consideration. The results are tabulated below:

Table 4.02: Correlation Matrix

Variables	ROA	ART	CCC	DTOE	ITOD	ITOT	OPC
ROA	1	0.618693	-0.27259	0.684193	0.192199	-0.36414	0.162552
ARTD	-0.32529	-0.68616	-0.36411	-0.2855	-0.54778	0.541088	-0.58825
ARTT	0.618693	1	0.22486	0.548904	0.660166	-0.8453	0.731797
CCC	-0.27259	0.22486	1	-0.2971	0.714466	-0.4499	0.666329
DTOE	0.684193	0.548904	-0.2971	1	0.350947	-0.49119	0.254631
ITOD	0.192199	0.660166	0.714466	0.350947	1	-0.87939	0.896309
ITOT	-0.36414	-0.8453	-0.4499	-0.49119	-0.87939	1	-0.86787
OPC	0.162552	0.731797	0.666329	0.254631	0.896309	-0.86787	1

The table reflected above shows the relationship of return on assets (ROA) with accounts receivable turnover in time (ART), cash conversion cycle (CCC), debts to equity (DTOE), inventory turnover in days (ITOD), inventory turnover in times (ITOT) and operating cycle (OPC). The results show that accounts receivable turnover (ART) has significant positive association with return on assets (ROA), profitability acts as an inverse relationship with liquidity or the cash conversion cycle, our results proves that cash conversion cycle of all three firms has negative relation with return on assets. Debts to equity is required a strong relation with ROA. Our results show that DTOE (0.684193) has significant positive relation with profitability. Inventory turnover in days has weak positive relation with ROA. Operating cycle is main source of regenerating the cash for reinvestment as the low time of operating cycle it is best for the company so our study prove that it has weak positive relation with profitability correlation with stock prices

Regression analysis

Regression analysis technique is a statistical tool which is being applied for studying the linear relationship between two or more variable. If the variables are equal to two it is called univariate regression but if the variable are more than two then it is called

multivariate regression. It starts by the general assumption form of relationship which is known as regression model. It can be written as in the equation form as:

Equation No.4.01

$$Y = \alpha + \beta_1 X_1 + ... + \beta_k X_k + \varepsilon .$$

Whereas:

Y= Dependent variable

α = Constant

$\beta_1 X_1$ + to.+ $\beta_k X_{k=}$ These are explanatory variable

ε .= Residual Term

The regression results of the data are tabulate in table 4.03 as:

Table 4.03: Regression analysis

Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/01/01 Time: 00:21
Sample: 2004 2013
Periods included: 10
Cross-sections included: 3
Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.223601	9.531657	0.967681	0.3433
ART	0.066003	0.017654	3.738587	0.0011**
CCC	0.026262	0.026338	0.997105	0.3291
DTOE	2.424353	0.884611	2.740587	0.0117**
ITOD	-2.716351	2.376750	-1.142885	0.2648
ITOT	-0.056576	0.127740	-0.442900	0.6620
OPC	-0.036977	0.032790	-1.127679	0.2711
R-squared 0.694592		Mean dependent var		2.510333
Adjusted R-squared 0.614920		S.D. dependent var		2.836849
S.E. of regression .760401		Akaike info criterion		4.169924
Sum squared resid 71.27728		Schwarz criterion		4.496870
Log likelihood-55.54886		Hannan-Quinn criter.		4.274517
F-statistic8.718176		Durbin-Watson stat		1.451607
Prob(F-statistic) 0.000052				

The significance of variable results obtained by statistical method can be verified by the Coefficient, standard error test, t-statistics, Adjusted R-squared, F-statistic, Prob.(Statistic)and the Durbin-Watson statistics. Briefly, the econometric test technique applied in this study is through E-views-6 reveals statistically significant relationship between the endogenous variable and exogenous variables from the model. The above regression results shows that ART and DTOE has significant positive impact on ROA..while other variables have insignificant impact on ROA. The R-Square value shows that overall variable independent variable effect dependent variable by 69.46%. Durbin Watson results show the value is within the range i.e.1.451607. The F-statistics results show that all variables individual are significant.

Pair-Wise Granger Causality Test

Testing of causality is one of the kinds of statistical tools which are broadly used in the predicting historical models of time series data. Granger (1969) and Sim (1972) have finalized the application of causality tests in economics. Granger Causality Data Test Technique is widely employed to test whether time series has significant in the forecasting of other data sets of time series (Granger, 1969). In the year 1988 Standard Granger Causality Test technique has been finalized by the Granger and became able to predict whether past values of the variables helps to predict changes in another variable. The definition of causality test speaks that in the restrictive delivery, the lagged values of Yt add number in a row to account for activities of Xt beyond that provide by the lagged values of Xt itself (Green, 2003).The fact should be noted is that the Granger causality technique measures the information given by one variable and keeping in view of this information it explains the latest value of another variable. Besides, variable Y is Granger caused by variable X subject to the condition that variable X assists in predicting the value of variable Y. In view of above condition the lagged values of variable X are statistically significant in explaining variable Y. The null hypothesis (H0) that we test in this case is that the X variable does not Granger cause variable Y and variable Y does not Granger cause variable X. In short, one variable (Xt) granger cause another variable (Yt), if the lagged values of Xt can predict Yt and vice-versa. The results of this test are tabulated in table 4.03 as:

Variables	Obsv.	F. Stat.	P. Value	Decision	Type of Causality
ROA Vs. CCC	24	0.77153	0.4763	DNR Ho	Uni-directional causality
CCC Vs. ROA	24	1.59899	0.1807	DNR Ho	Uni-directional causality

ROA Vs. DTOE	24	28.0689	2.E-06	Reject Ho	Bi-directional causality
DTOE Vs ROA	24	0.04238	0.9586	DNR Ho	Uni-directional causality
ROA Vs. ITOD	24	1.32800	0.2885	DNR Ho	Uni-directional causality
ITOD Vs ROA	24	1.05372	0.3681	DNR Ho	Uni-directional causality
ROA Vs ITOT	24	0.27197	0.7648	DNR Ho	Uni-directional causality
ITOT vs ROA	24	0.84122	0.4466	DNR Ho	Uni-directional causality
ROA Vs OPC	24	0.36956	0.6959	DNR Ho	No Causality
OPC Vs ROA	24	1.14101	0.3404	DNR Ho	Uni-directional causality

Results of Pair-wise Granger Causality Test

Alpha (α) = 0.05
Decision rule: reject H0 if P-value < 0.05.
Key: DNR = Do not reject;

Conclusion and Recommendation

Based on previous studies and their results the hypothesis of this study is being presented as below:

- The set of data analysis results revealed that there is a significant positive relationship among accounts receivable turnover (ART) on return on assets (ROA), between debts to equity ratio.
- The T-Value of inventory turnover in days and time show negative impact which is good. As we hold shortest day our inventory, resultantly cash will be blocked less days and will remained in circulation and create more profit.
- Like inventory turnover the operating cycle has also negative T Value is a good sign for the model it reveals that less days our cash will remain in circular and have good impact on profitability. Hence, the test results of this research study pointed out that through proper effective working capital management, company can enhance its profitability.
- The above study will beneficial and donate knowledge by pointing out how auto mobile manufacturing companies manage their working capital effectively and efficiently which leads to enhance the profitability in business.

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