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Cash Conversion Cycle Management in Auto Mobile Industry: Relationship with Firm Performance, Leverage, Liquidity and Capital Employed

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Abstract
The business entities seek for different tools to maximize the shareholder wealth. The management of cash conversion cycle is one of the tools that play an essential role to generate maximum earnings to business firm. The recent paper is an effort to find out the different determinants that persuade cash cycle in automobile division in Pakistan. This industry provides employment opportunities to more than 192000 people directly and 1200000 indirectly. The data of eleven companies from this sector is analyzed to establish a relationship between profitability, leverage, capital employed, liquidity and cash conversion cycle. The data selected for this purpose ranges between 2008 and 2013. Multiple linear regression model is adopted for results. The outputs confirm that a negative considerable relation exists between return on assets, liquidity and cash cycle, whilst leverage and capital employed present a positive significant association with cash conversion cycle.
Keywords: Cash Conversion Cycle (CCC), Profitability, Liquidity, Leverage (debt) and Capital Employed

1. Introduction

Cash conversion cycle (CCC) is tool that is used to check the performance of a company with respect to its capital management. CCC is an imperative financial metric because it depicts organizational performance in financial terms and these results can be drawn from that data which is available in financial statements. One important aspect of finance is to collect cash immediately from account receivables and postpone the outflow of cash towards creditors. A firm with petite CCC vis-a-visextensive CCC typically highlights the organization is receiving cash immediately and paying on the date. Similarly, an organization with a shorter CCC is demonstrating efficient management of internal operations and ultimately it brining's liquidity in its operations.
CCC evaluates the time duration of funds that tied up with inventories and receivables, less the time duration that belongs to the payment of suppliers. Although companies and specially their financial managers mostly focus on long term investment and gave less attention towards working capital management but now firms are trying to focus on their short term investment because it help them to transfer one investment to other investment rapidly. Today companies are countering numerous challenges like prompt change in demands, cost behavior, market competition and specially their goal of maximizing shareholder's wealth.

Organizations are indulged in the usage of number of methods like Supply chain management (SCM) for achieving their goals. This method has the power to improve the three key components of financial performance which are profitability, growth and capital utilization. Though SCM is a good method to control their operations but CCC helps them to evaluate the efficiency of the management with respect to capital management. The idea of C2C leads towards the authenticity that a reduction in the time slot of CCC will lead toward operational as well as financial improvement while the reduction of C2C time can be achieved without increasing sales and reducing cost as well (Soenen 1993).

Traditionally there are two measures were taken to check the liquidity position of an organization such as current and quick ratio but according to the (Aziz and Lawson 1989) and (Largay III and Stickney 1980)the results of these measures are questionable. In this paper the liquidity of automobile sector is checked on the basis of net balance position while net balance position expressing excess or shortage of cash after financing in working capital needs and fixed assets. (Hager 1976) was the person who introduced this dynamic liquidity measure with a name of CCC.

1-Background of the industry

Pakistan's automotive industry sector is depicting more growth as compare to other sectors because demand of all type of vehicles increasing day by day. Automotive industry is the second largest tax payer after the oil and petroleum sector of Pakistan. Though Pakistan is indulged to produced number of vehicles but still mostly vehicles, auto spare parts and components are imported from foreign countries which ultimately increase cost of production.

This sector is providing jobs more than 192000 people directly and 1.2 million indirectly. The total investment in this sector is more than Rs 98 billion while it contributes Rs 63 billion as an indirect tax. Though in Pakistan there are 10 cars for 1000 people and this ratio is less than the other emerging economies but in

reality it speaks more potential of growth in auto sector in coming years. The Auto Industry development Program (AIDP) and National Trade Corridor Improvement Program (NTCIP) are two major initiatives taken by the government for the development of automotive sector in Pakistan.

I-Significance

This paper has too much importance for automobile companies of Pakistan because it will help to rank them on the basis of their time duration of CCC and ultimately the results of regression or descriptive stats assist them to understand the impact of liquidity, capital employed and profitability on CCC. The results of this research paper also help the automotive industry to understand which one is the important variable of the CCC.

II-Research Question

I. How does CCC effect as a liquidity tool?
II. What is the impact of profitability, liquidity, capital employed and leverage on CCC.?

III. Research Objective

To examine CCC as a liquidity tool.

To investigate the impact of profitability, liquidity, capital employed and leverage on CCC

IV-Problem Statement

The purpose of this paper is to explore the CCC of automobile companies. Furthermore, the problem statement is to identify the impact profitability, liquidity, leverage and capital employedon CCC. One the company has a shorter CCC it means the company is recovering its cash from the debtors immediately as compare to pay cash to the vendors. Hitherto, shorter or negative CCC means lower time duration for account receivables, inventory and longer time duration for payables.

2: Literature Review

Independent Variables:

1) **Liquidity (Net Balance Position):**
   In this study, contrary to traditional measures such as current and quick ratios, net balance position (NBP) is used to measure liquidity (Ebben and Johnson 2011). NBP estimates the excess and shortage of cash after financing to firm's assets and working capital needs. It is calculated as available working capital (AWC) minus required working capital (RWC). AWC is taken as long term debt plus equity minus fixed assets whereas RWC is receivables plus inventory plus minimum cash cushion minus payables. Minimum cash cushion is 5 days of sales consistent with (Johnson, Nenide et al. 2004). NBP demonstrates the firm's ability to meet short term cash obligation more effectively than traditional measures.
2) **Profitability**:
   ROCE is taken as measure of profitability. ROCE is obtained as earnings before interest and tax (EBIT) divided by capital employed. Capital employed is equal to total assets less current liabilities or long term liabilities plus owner's equity. It is measured as independent variables in many literatures as evidence given by (Lyroudi and Lazaridis 2000; Nazir and Afza 2009; Baños‐Caballero, García‐Teruel et al. 2010). According to our assumption profitability has negative relation with CCC. It means when the time duration of CCC increases then the profits of the company will decrease.
3) **Leverage:**
   Debt equity ratio is used as a dimension of leverage. DER is obtained as total debt divided by total equity (Lyroudi and Lazaridis 2000; Nazir and Afza 2009; Baños‐Caballero, García‐Teruel et al. 2010). According to our assumption there is positive relation of CCC with leverage which mean company needs less amount of debt in case of shorter CCC.
4) **Capital Employed:**
   Capital employed is formulated as total assets less current liabilities or long term debt plus equity. It has a positive relation with CCC.

Dependent Variable:

1: Cash Conversion Cycle (CCC)

CCC is selected as dependent variable in the study as it was used in literature (Lyroudi and Lazaridis 2000). CCC is measured as days of sales outstanding plus days of inventory outstanding less days of payment outstanding. A shorter CCC indicates good business position as compare to positive one.

Richards and Laughlin (1980) recommended that cash conversion cycle provides dynamic insight as compare to the other traditional but static liquidity measures. They confirmed that there is positive relation between CCC and quick and current ratios. The characteristics of a good liquidity measure and he introduced Lambda as a new liquidity measure. Lambda is the ratio of cash flow funds to potential cash flow requirements, demonstrating the extent to which a firm's funds cover its potential cash requirements. A greater value of lambda is depicting high liquidity position of a corporation (Emery 1984).

Belt (1985) investigated the cash conversion cycle for the period of 1950 to 1983 for those US Manufacturing, Trade Corporations and Mining firms that had quarterly financial reports. He found that mining

as well as retail and wholesale firms had shorter cash conversion cycle. He also concluded that CCC increased in recession period and CCC is unstable in the case of durable goods while it persistently decreased in case of non-durable ones.

Kamath (1989) examined the relationship between traditional measures of liquidity and cash conversion cycle. He also identified the relation of net trade cycle and cash conversion cycle as well. There were six larger US retailer firms used in this paper with a period of 1970 to 1984. He confirmed that there is negative relation between traditional measures of liquidity and CCC. There is positive relation between profitability and quick and current ratio. The results of net trade cycle were similar to the results of CCC and both cycles had negative relation with profitability.

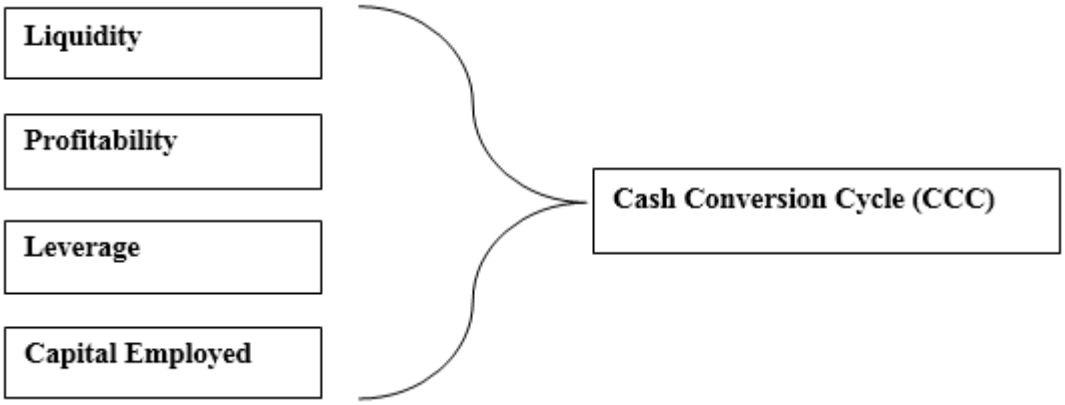
Schilling (1996) argued that CCC is a technique of working capital management which shows the average liquidity position of a company. One advantage of this technique is that it helps to estimate changes in circulating capital and ultimately management can take measures for batter handling. (Moss and Stine 1993) examined CCC of US relating firms on the basis of firm size. The results demonstrating that bigger companies have shorter CCC as compare to small companies so these smaller companies need to focus on their cyclical period of cash.

Net Trade Cycle (NTC) is the alternative of Cash Conversion Cycle that introduced by the (Shin and Soenen 1998). They evaluated profitability and efficient working capital in their study. The results showed negative relation between NTC and profitability. Furthermore, they confirmed shorter NTC gave higher stock returns.

Deloof (2003) conducted a research in which he tried to find a relationship between working capital management and performance of Belgian companies. A sample of non-financial firms is used for the time duration of 1992 to 1996. He found a negative significant relation of gross profit and cash conversion cycle. The results confirm that if the mangers reduced the time duration of inventories and receivables then ultimately they brought value for stockholders.

Ganesan (2007) examined the efficiency of firm's working capital management and a sample of telecommunication equipment corporations is used. He found that days working capital have negative but insignificant relation with profitability. They conducted a research to find out association of working capital management with profitability in Brazilian companies. The dependent variable profitability defined into 3 different parts like return on asset (ROA), return on equity (ROE) and return on sales (ROS) while independent variables were CCC, debt ratio (DR), day's receivables, day's inventory and days of working capital. The results identify that there is a negative relation between these variables.

Conceptual Framework



3: Methodology

Development of Hypothesis

H1: There is a negative relation between CCC and profitability (ROCE).
H2: There is a positive relation between CCC and leverage (DER).
H3: There is a positive relation between CCC and capital employed.
H4: There is a negative relation between CCC and liquidity (NBP).

Sample

The main aim of this study is to discover the relationship of CCC with profitability (ROCE and ROA), liquidity (NBP), capital employed (CE) and leverage (DAR and DER). For this purpose, the Automobile sector has been chosen from KSE 100 index in Pakistan. Out of 15 companies in this sector, data of 11 companies is obtained from their annual reports. The time period selected for the study ranges between 2008 and 2013. The companies are selected on convenient based sampling. Variables have been selected on the basis of past study in this

field.E-views software and linear regression model is used for analysis.

4 Analysis Data

Model and Equation:

In the present study, we are trying to single out the association of CCC with profitability, liquidity, capital employed and leverage. The CCC is taken as predicted whereas the other variables are used as independent variables. For this purpose, linear regression model is tested. The equation is demonstrated below:

$$CCC = \beta_0 + \beta_1 ROCE + \beta_2 DER + \beta_3 CE + \beta_4 NBP + \varepsilon$$

Where, CCC= Cash conversion cycle, ROCE= Return on capital EmployedDER= Debt to equity ratio, CE= Capital Employed, NBP= Net balance position

Formulas of the variables:

CCC	DSO + DIO – DPO
Days sales outstanding	(average account receivable/ sales)*365
Days inventory outstanding	(average inventory/ cogs)*365
Days payable outstanding	(average inventory / cogs)*365
Capital employed	Total assets – current liabilities
Return on CE	Earnings before interest and tax (EBIT) / capital employed
NBP	WCA-WCR
WCA	Long term debt+OE-fixed assets
WCR	Minimum cash cushion+AR+inventory-AP
DER	Total debt/ total equity

Results Discussion:

The current study is an attempt to investigate the association of CCC with profitability, liquidity, capital employed and leverage. The automobile industry is the target of this study. Eleven companies from this sector are selected on convenient based sampling.

Table 1: Cash conversion cycle

Companies	2013	2012	2011	2010	2009	2008	AVG
Gandhara Nissan ltd	-26	-200	-267	-117	-125	-109	-141
INDUS MOTOR CO LTD	-30	-158	-191	-22	-18	-17	-73
Sazgar Auto ltd	-41	-28	-25	-29	-25	-17	-27
Atlas Honda	-19	-20	-17	-12	-16	-12	-16
General Tyre	-4	-12	-5	9	18	20	4
PAK SUZUKI	30	22	24	24	26	22	25
Atlas Battery	29	26	25	26	37	40	30
Exide Pak	39	49	58	54	49	79	55
AGRIAUTO INDUSTRIES LIMITED	90	70	70	65	70	68	72
Balochistan Wheels	188	145	125	105	93	78	123
GHUNI AUTOMOBILE IND LTD	183	91	82	101	171	149	130
Average CCC							= 17

Table 1 shows the average CCC of sample companies. Average cash cycle of the sample companies is 17 days. It means the companies fall in automobile sector recovering their funds after 17 days. The one principal of finance is to collect cash as quickly as possible whereas delay payments as long as possible. In case of positive cash cycle, the company needs to take loans for meeting its current expenditures, whereas in negative case, companies receive amount against its product in advance as compare to payment to the vendors.

The CCC of Ghani Automobile Ltd is 130 days whereas the lowest CCC is of Gandhara Nissan Ltd which is -141. The Ghani Automobile has a very high CCC period which means that they are not managing their inventory efficiently as well as their receivable period is high whereas they make their payments quickly that's why CCC period is high. The negative cash cycle means that Gandhara Nissan Ltd has a negative cash conversion cycle which ensures that this company receiving cash from its customers in advance before giving its goods and services. This negative CCC also confirms the efficiency of the management to control its operations because in this scenario the company has the ability to invest other projects and as well as it can fulfil its short term obligations immediately.

Table 2: Descriptive Stat

	CCC	ROCE	DER	CE	NBP
Mean	2.268943	1.310471	0.002713	6.789746	8.488426
Median	1.985773	1.426638	0.021776	6.403850	7.131113
Maximum	4.854644	3.004954	1.349815	8.811050	16.01670
Minimum	0.936288	-0.092077	-0.876841	5.807482	2.209515
Std. Dev.	0.951873	0.474649	0.497572	0.847655	3.306534
Skewness	1.254466	0.207999	0.293132	1.017861	0.734892
Kurtosis	3.826721	6.388200	2.979991	2.916289	2.703078
Jarque-Bera	19.19007	32.04561	0.946293	11.41573	6.183175
Probability	0.000068	0.000000	0.623039	0.003320	0.045430
Sum	149.7502	86.49109	0.179071	448.1232	560.2361
Sum Sq. Dev.	58.89410	14.64394	16.09256	46.70374	710.6557
Observations	66	66	66	66	66

Table 2 depicts the values of mean, median, kurtosis and skewness which give indication about the normality of data. We take log of variables to make them normal. The skewness value must be between -1 to +1 for normal data. Another source to check the symmetry of data is the values of mean andmedian. If they are near to each other, it means that data is symmetric. Standard deviation shows how much the value far away from their center. The data is normal as we can see from this table because there is no difference between the values of mean and median and even the values of skewness also fall under the standardize values.

Table 3: Correlation

	CCC	ROCE	DER	CE	NBP
CCC	1.000000				
ROCE	-0.264470	1.000000			
DER	0.406899	0.042775	1.000000		
CE	0.222715	0.104890	0.074062	1.000000	
NBP	-0.058894	0.170124	0.435233	0.302908	1.000000

This table explains the correlation of variables. The standardized value of correlation is -1 to +1. Negative value shows that there is an inverse relation between two variables, whilst positive figure tells positive relation. Profitability and liquidity give inverse relation with cash cycle, while capital employed and leverage are demonstrating positive one. In the above table, all variables confirm our assumptions about their relation with CCC.

Table 4: Regression

Dependent Variable: CCC				
Method: Panel Least Squares				
Date: 02/26/15 Time: 23:33				
Sample: 2008 2013				
Periods included: 6				
Cross-sections included: 11				
Total panel (balanced) observations: 66				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ROCE	-0.524942	0.205275	-2.557257	0.0131
DER	1.044449	0.214469	4.869928	0.0000
CE	0.353688	0.119049	2.970929	0.0042
NBP	-0.100005	0.034116	-2.931328	0.0047
C	1.401468	0.797801	1.756663	0.0840
R-squared	0.381986	Mean dependent var		2.268943
Adjusted R-squared	0.341460	S.D. dependent var		0.951873
S.E. of regression	0.772450	Akaike info criterion		2.394234
Sum squared resid	36.39738	Schwarz criterion		2.560117
Log likelihood	-74.00973	Hannan-Quinn criter.		2.459782
F-statistic	9.425814	Durbin-Watson stat		0.701445
Prob(F-statistic)	0.000005			

The results of regression model explain the impact of predictors on predicted one that is CCC. There is 38 percent variation in the dependent variable due to independent ones. The value of F statistic is 9 while the probability of F statistic is 0 it means the model is fit to check the impact of predictors on predicted variable.

The adjusted R squared give a modification to the R squared value, if predictors has the relation with dependent variable then the value of adjusted R square will increase otherwise decrease. Durbin Watson explains the autocorrelation between the variables and its values fall between 0 and 4. If value is two then there is no autocorrelation, if value towards zero then there is a positive autocorrelation and value toward four shows negative autocorrelation.

According to the regression model return on capital employed and net balance position give a negative significant relation with cash cycle that justify our assumption,while debt equity ratio and capital employed show positive considerable association with cash cycle.

5: Discussion and Conclusion

The basic objective of this paper is to check the performance of the management or a company that is based on capital management. Though current and quick ratio is used as a liquidity measure but according to some researchers their results are static and questionable. So these researchers recommended CCC as dynamic measure for liquidity. The first part of this paper is based on the measurement of CCC which ultimately depicts the time duration of a company to turn back cash into cash. The results confirmed that Gandhra Nissan Ltd has a negative CCC which means that this organization received cash in advance for future services or products.

To check the association of cash cycle with firm's performance, liquidity, capital employed and debt, this study analyze the regression model by using E-views software. Automobile sector is selected for this purpose. 11 company's data for six years are tested to single out the relation among selected variables. On the basis of results, we find out a positive significant relation of capital employed and leverage with CCC. It explains that the firms with lower investment and debt have lower cash cycle. The second findings of the study give significant inverse relation of liquidity and performance with cash cycle (Lyroudi and Lazaridis 2000).

It tells that high liquid and profitable firms have lower cash cycle. The outcomes provide a negative but significant relation between ROCE and CCC. It clarify that high profitable firms manage its cash cycle proficiently. The time period of its CCC is low.The results provide essential information to the finance management. By managing cash conversion cycle efficiently, a firm provides high profit and liquidity. The required investment to finance working capital becomes low when CCC is managed proficiently. The length of cash cycle can be reduced by making good long term business relations with vendors and creditors. It can be achieved through constructing longer loan repayment time period. But this approach only works when business is stronger and larger than supplier's and they depend on your business. The cash cycle can also be shortening by offering some benefits and incentives to customers for making their payments fast. The third technique that can be used to minimize cash cycle period is proper inventory handling. Inventory holds a considerable working capital portion. By using appropriate tools for inventory management, cash cycle can be optimized.

Limitations and Recommendations

In this paper only eleven companies out of fifteen companies taken due to non-availability of data of other four companies. The data of this paper is depicting 73 percent of the whole population. In future the researchers can expand this work with the help of other variables and even with a change in the position of variables like they can use CCC as an independent variable and profitability, leverage and liquidity as a dependent one. In future, one can check the relation of net trade cycle (NTC) and CCC and after that with profitability as well. This paper is based on the data of one sector while the time duration ranges from 2008 to 2013 but in future one can take other sectors that listed in Karachi Stock Exchange and increases time duration for more authentic results.

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