

Relationship between Cash Conversion Cycle (CCC) with Firm Size and Profitability

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Abstract *There are two main areas in which this article focus (1) checking the length of cash conversion cycle with respect to the size of the firms. (2) Examining the length of CCC with respect to the profitability of the firm. For the purpose of research the data is collected from the listed companies of Karachi Stock Exchange (KSE) over the period of 2012-2016. Descriptive statistics of the study shows that all firms of the sample have favorable Cash conversion cycle but Tobacco sector is at number one with the lowest value of Cash conversion cycle. The Pearson correlation and regression analysis is conducted for the empirically testing of the results. The results of the study show that the relationship of Cash conversion cycle with profitability and size is insignificant. It means that the favorable answers of the Cash conversion cycle is not due to the firm size and favorable answer does not has a positive impact on the profitability of the firms.*

Key words Cash Conversion Cycle (CCC), firm size and profitability

<http://dx.doi.org/10.6007/IJARAFMS/v7-i4/3692> (DOI: 10.6007/IJARAFMS/v7-i4/3692)

1. Introduction

Cash conversion cycle (CCC) is a powerful tool for accessing how well a company managing its working capital. A company's with the shorter CCC time lag is more efficient because it turns its working capital more times in a year and as results they generate more sales and profit from their working capital. Corporate finance mostly focuses on the short term and long terms decisions of the capital budgeting, dividends decisions and the investment decisions. But the (Smith, 2002) is on the view that managing of the working capital is important because it's directly effects on the profitability and risk of the firm. After the argument of the Smith a lots of researcher are focus on the working capital management of the firm. Cash conversion Cycle (CCC) is used as a measurement based in order to measuring the working capital management of any large firm or the small firm. CCC measures the time lag between the expenditures on the purchase of the raw material and collections of the sales on finish goods from the customers. The longer the time lags of CCC than larger the working capital is required by the firm and shorter the time lag of CCC less working capital is required by the firm.

However this factor is explaining by the (Soenen, 2007) more the length of the Cash Conversion Cycle is more the firm's rely on the external finance. There is not too much attention is given previously to the study of the impact of CCC on the working capital management. But now in current era a lot of researchers are not only focus on the larger firm's but also focus on the smaller firm's working capital management. Because the SMEs also facing the challenges of efficient management of the working capital. The (Genesan, 2007) is on the view that the trade credit is more valuable and important for the small firms. For successful managing the firm, liquidity management plays an important role. (Peel *et al.*, 2003) on the view that the smaller firms has higher proportion of the current assets as compare to the larger firms, and the small firms also have the less liquidity and mostly rely on the short terms debts. (Grablowsky *et al.*, 2001) On the view that for the survival and growth of small and large both the firms the cash conversion cycle (CCC) must be reduce for efficiently managing the working capital. Liquidity management refers as a management of the current liabilities and the asset. Due to the poor management of the liquidity many companies are not meet its current liabilities. So the company has to be arranging the external financing sources for meeting the requirements of short terms debts.

Normally the small firms are not able to find external financing sources easily. If they find the external sources for financing due to the heavy cost of borrowing, their profit level will be decreased (Josse *et al.*, 1996). The firms which have long term goals and healthy bottom line are not remain solvent without the better management of time lag of cash conversion cycle to the working capital management.

Cash conversion cycle (CCC) is a very effective tool for accessing the liquidity of the firm. For the credit analyst the cash conversion cycle is an important tool for accessing when companies need cash and when they need to spend for purchasing the inventory and raw material (Stine and Moss, 1993). Cash Conversion Cycle (CCC) means the time period of cash payment for the purchase of an inventory to the supplier and the cash received from the customers (receivables) against the sale of goods and services. Longer the cash conversion cycle means firm can do more sale because the company is now giving more credit to its customers and also giving more time for the credit. In this way a firm can expand their business and profitability but the firm may have shortage of working capital in this way.

Next section also discusses about the definitions of CCC made by various authors. One way for measuring the liquidity is the current ratio and quick ratio. The current ratio and the quick ratio are the traditional measures of liquidity and are better liquidity indicators of the firms. But they focus on the static balance sheet (Stine and Moss, 1993). The other method for measuring the ongoing liquidity management is the cash conversion cycle (CCC) which combines both the data of balance sheet and the income statement to create results according to the time dimensions (Josse *et al.*, 1996).

For evaluating the cash conversion cycle CCC performance and their future aspects, the industry benchmark plays a crucial role for evaluating the individual firm's CCC; because the length of Cash Conversion Cycle (CCC) is different in each and every industry. That's why it is better to compare each firm with its relevant industry in which it works or operates. The basic purpose of the research paper is to provide the industry benchmark for Cash Conversion Cycle. The industry benchmarks are helpful for the firms to check and evaluate their performance as compared to the industry. Industry benchmark also helps to the firms to avoid the liquidity problems.

Explanation of Cash Conversion Cycle. Different approaches

Different authors explain the cash conversion cycle (CCC) in different ways. According to the (Padachi, 2006) cash conversion cycle used as a measure of working capital because it shows the time lag between the expenses which the companies do for the purchase of the raw material or the inventory and the cash received from customers against the sale of goods and services. Management of the firm's short term assets and liabilities on a day to day basis efficiently is very important for the success of the firms. The firms having long term perspectives and strong bottom line do not remain solvent without better management of liquidity (Josse *et al.*, 1996). More definitions of cash conversion cycle are given below.

Table 1. Perspective of Different authors

Description	Definition/Explanation	Sources of Definitions
Cash Cycle Time	Cash cycle time is the time between the cash received from the customers and the time in which the cash is paid to the suppliers.	(Marton and Bodie, 2000)
Cash Conversion Cycle	Cash conversion cycle is the sum of the days of the sale outstanding means average collection period, less days of payable outstanding.	(Kaown et al., 2003)
Cash Cycle	Cash cycle is basically the measurement of the days when we collect cash from the customers and the days when we pay the cash to the suppliers from	(Jardan , 2003)

Description	Definition/Explanation	Sources of Definitions
	which we purchase inventor or raw materials.	
Cash gap	Cash gap is measures the time period between the cash paid for the expenditure on the purchasing of the raw material and the cash received from the customers against the sale of goods and services to the customers.	(Eljely, 2006)

Cash conversion cycle is more favorable if it is negative because more the period of CCC is shorter more the company's working capital is manage efficiently. Positive CCC means that the company has to pay to its supplier for the purchase of inventory but the company is not received cash from its customers. This situation is not favorable for the any company survival and company may have to borrow funds to pays its supplier. Similarly the negative CCC means that the company received cash from the customers before its pay to its suppliers. This situation is favorable for any firms (Hutchison *et al.*, 2007). So the goals of any firm is to have low CCC and if possible negative. Because firms can manage its cash flow effectively if they have shorter CCC.

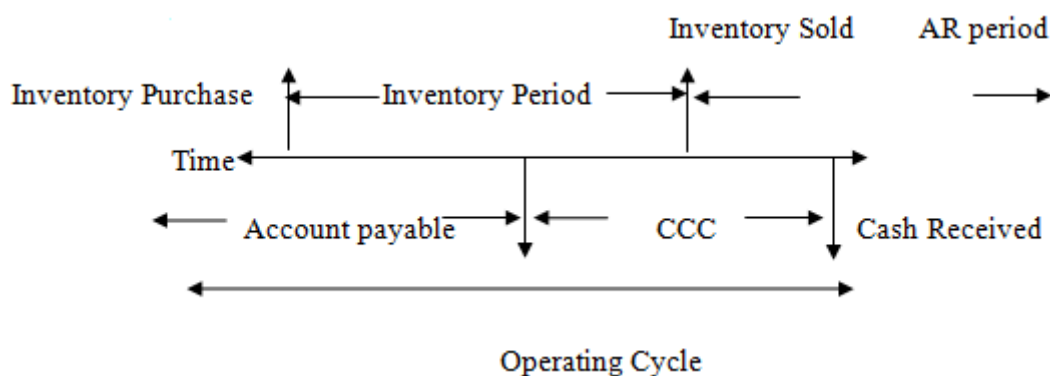


Figure 1. Cash Conversion Cycle (CCC)

Refer to the above Figure 1 for the cash conversion cycle (CCC) indicates the complete steps about the cash conversion of the working capital. First of all the in the inventories period the inventories are to be purchase than on the second step of inventories are to be sold. Then comes the account receivable period after receiving the cash than finally its pay to the suppliers from which the inventories or raw material are to be purchased. This is the complete picture of the cash conversion cycle. (Kaown *et al.*, 2003). Explains the cash conversion cycle with the help of following equation, most of the researchers also use this equation for explaining the cash conversion cycle.

Cash Conversion cycle = Days of Sales outstanding + days of sales inventory - Days of payables outstanding

In this above equation, CCC is the dependent variable which is defined as fallows:

Days of Sales Outstanding = $\frac{AR \text{ (Accounts Receivables)}}{\text{Sales}} \times 365$.

Days of Sales Inventory = $\frac{\text{Inventories}}{\text{cost of goods sold}} \times 365$.

Days of payable outstanding = $\frac{AP \text{ (Account Payable)}}{\text{Cost of goods sold}} \times 365$.

Any firm can reduce the working capital need if its follow the following guidelines of (Marton and Bodie, 2000).

- Slow down their payment to the suppliers against the purchase of raw material and inventory.

- Reduce the inventory time period. If the firm has stock they should sell them immediately so that it will convertible into cash quickly.
- Make the collection from the customers quickly. Lots of ways can be used to receive cash more quickly from the customer. For example you can give discount to the customers who pay cash earlier than the decided date and the customer who pays late charge extra money with penalty.

2. Literature review

The (Steward, 1995) elaborated the cash conversion cycle in a very simple manner he is on the view that CCC is the average days or time to converting the dollar invested in the raw material into the dollar collected from the customers. Stine and Moss, (1993) investigated the cash conversion cycle as the difference of the time lag between the accounts receivable and accounts payable. The cash conversion cycle (CCC) is the number of inventory days to supply plus the account receivable minus the account payable (Schilling and Seonen, 1993). The CCC is one of the important metric for calculating the liquidity of the firm also helps in the evaluation of the firm. The CCC is also important metric for the supply chain analysis because its works like a bridge, its start its cycle from the suppliers of inventories or raw material and carry until the final products is reach to the customers and cash is receive from the customers and paid to supplier for their inventories (Farris II and Huchison, 2002). The firms who manage the cycle efficiently can manage its short terms debts easily and can increases its sale and profit (Stine and Moss, 1993).

One of the most sensitive areas of the finance is the Cash Conversion Cycle (CCC) in the field of financial management. The cash conversion cycle directly affects the liquidity and the profitability of any firm. Genesan (2007) inquiries that the optimization of the working capital (WC) requirements means reduce the demand for the working capital and also generating the maximum revenue from it via efficiently manages CCC. Furthermore while managing the working capital efficiently the firm growth is increase and also generates good revenue for the stakeholders. The firm who works at the optimal level can manage its cash flow efficiently and there firm's value also increases (Afza and Nazir, 2007). The CCC discuss about how the cash is rotate within the organization. All kinds of businesses whether they are working at the small level, medium or large level liquidity management are the most important for all. In the corporate finance the working capital management is important because it's directly affects the firms risk and profitability. (Appuhami; Rehman and Nasir; Deloof; Christopher and Kamalavalli; Dash and Ravipati, 2003-2009) Because for paying the short terms debts it is compulsory to receive cash from the customers within time. The firms may have cash shortages if they unable to manage its liquidity properly and as a result the firms are unable to pay its short terms and long terms liabilities. For all level of organization Liquidity management is as important as the profitability factor is important for organization. The firms with having the less currents assets may face difficulties in handling the working capital (Horne Van and Wechowicz, 2005).

The rate of return on an investment is called as the profitability. Vishnanni (2007) argued that in the current asset unwarranted high investment would reduce the rate of return. For creating the desire level in the profitability and the risk of the firm the currents accounts should be manage efficiently and maintain the working capital. Ricci and Vito (2000) and Shinn and Soanen (1998) argued that, for creating the corporate strategy and creating the stakeholders value working capital plays an important role. Following are the main component of the cash conversion cycle (CCC). The time which is taken to collect cash from the customer is known as the Average Collection Period (ACP). The Average collection period (ACP) is used as an independent variable in the previous study. The period to convert the inventories into the sales is known as the Inventory Conversion Period (ICP). The time in which the payment is made to its suppliers is known as the Average Payment Periods (APP). This is also consistent with the study of (Rao, 1989). Firms set an optimal level of working capital that maximizes its value. According to (Lancaster *et al.*, 1999) and (Marton and Bodie, 2000) huge inventory stock prevents the problem of stock-out and efficient credit trade policy helps to increase the sales. Credit trade enhances the level of sales because it allows the customers to check the product quality before making the payment. Late payments to the supplier allows the firm an opportunity of financing while late payments in the case of purchases is not in the favor of the firm if discount is offered on early payments. Conversion cycle is the measure of working capital management. Conversion cycle is the difference between the payment of purchases and the collection of the sales.

Longer the lag means larger investment in working capital. A longer cash conversion cycle may increase or decrease the profitability. Sales will increase as a result of longer cash conversion cycle that will lead to high profitability. Profitability may be reduced when cost of investment in working capital is higher than the benefits of investment in working capital. This discussion of working capital management and its impacts on profitability leads to the problem which will be analyzed in this study.

The firms should avoid on the one hand too much investment in their current assets because if their investment is short then the firms may be unable to meet its short term debts and obligations, on the other hand they efficiently manage the working capital involves the planning to control the current assets and the current liabilities to minimize the risk for the firms (Eljely, 2006). For solving the problems of day to day operations managers must involve with the working capital decisions (Rehman and Nasir, 2007). The basic purpose is that the current asset is the short lived investment which is continually converted into the other assets types. As well as liabilities are concerns the firms are responsible to pay them on the timely basis. Decision making on the different levels of the cash conversion cycle (CCC) is difficult and time consuming.

Static and dynamic views are the two different and distinct ways for examining the corporate liquidity (Lancaster *et al.*, 1999; Hutchison *et al.*, 2007; Stine and Moss, 1993). Current ratio and the quick ratio are the static view which is most commonly used as a traditional ratio calculated from the balance sheet figures. This static view analysis gives results of liquidity measures at a given point in time. The dynamic view measures the liquidity from the firm's operations. For measuring the dynamics measures of time it takes a firm to go from cash out-flow to the cash in-flow which is also measured by cash conversion cycle (CCC).

The firm size is an important factor in the length of the Cash Conversion Cycle. This study is conducted by the (Stine and Moss, 1993) on the retail firms which show that the larger firms have shorter cash conversion cycle. A significant positive relationship was found when the cash conversion cycle is compared with the current and quick ratio. The empirical study of (Eljely, 2006) shows the relationship between the profitability and liquidity. Their results showed that there is a negative relationship between the profitability and cash conversion cycle. Another study conducted by the (Hutchison *et al.*, 2007) over the 21 public companies demonstrated the results of direct correlation between shorter cash conversion cycle and high level of profit for the 75 percent of the industries.

Schilling (1996) explained about the sufficient level of the liquidity position means the minimum level of the liquidity which is required to fulfill the minimum requirements of the business. He is on the view that it is doubtful to deploy the resources between the working capital and the capital investment because usually the return on the investment may be less than the return on the capital investment. So according to him deploy only the resources which fulfill the optimum level of the liquidity. Then he establishes the relationship between the cash conversion cycle (CCC) and minimum level of the liquidity in such a way that, if the CCC is lengthens the minimum liquidity requirements increase and if the CCC is shortens then the minimum liquidity requirements decrease.

3. Methodology of research

This research article mainly focuses on the cash conversion cycle (CCC) of any firms with respect to the size of the firms and the firm's profitability. Total assets and total sales revenue average is considered as the size of the firm's whereas the return on assets and the return on equity are considered as the profitability factor of the firm. The data is collected from the listed companies of Karachi Stock Exchange (KSE) that is international stock exchange for the 5 years from 2012 to the 2016. The manufacturing and the merchandising companies are to be selected for evaluation of our results. Four sectors are to be selected which include the textile, paper, transportation and tobacco sectors. Total thirty (30) companies are selected for the evaluation of our results. Firm size is to be measured with the help of total asset and total sales revenue, and profitability is measured with the help of return on asset (ROA) and return on equity (ROE).

4. Analysis and discussions

Four sectors textile, transportation, tobacco and paper industry are used for the analysis of the CCC with the firm's profitability and the firm's size. As explain in the earlier that the negative CCC is favorable as compare to the positive CCC. Shorter the CCC more it is better for the firm's success. In the following analysis as all the firms show the negative means value of CCC. It means all have their better cash conversion cycle (CCC) time. Twenty (20) companies are taken for the analysis of the textile sector. The mean value of the textile industry is -736.84 which shows that all the textile industry that they receive the payments from the customers before they pay it to its suppliers.

Table 2. Mean value by industry

Variables	Textile	Transport	Tobacco	Paper
CCC	-736.84	-812.603	-1642.32075	-335.2707405
ROE	-0.19717	-16.9785	0.647333333	0.155
ROA	0.01376	0.065053	0.316666667	0.107071429
T.A	3970.88	75335.11	9077.277778	10202.47143
Sale	6.672333	9.539732	10.19939594	7.143983073

Among the entire sector the tobacco industry shows the better results as compare to the other sector. There are two tobacco companies are working successfully one is tobacco Pak Ltd and the other one is the Lackson tobacco company. The tobacco industry shows the relatively shorter period as compares to the others sectors the means value for the tobacco industry is -1642.32 percent. As the tobacco sector and industry is the most successful industry of the region. They also make collections from their customers before it pay to its suppliers. But the paper industry has lesser CCC as compare to the other sectors but it is also in negative which is better for the efficient management of the working capital. It is a good indication for the firms of having the negative CCC and they should maintain that position in the future.

Correlation Analysis

The other most important factor in this article is the relationship between the cash conversion cycle with the size of the firm. For that purpose net sales and total asset are to be used. Pearson correlation analysis is conducted for calculating the total asset and total sales (See Table 3).

Table 3. Correlation Matrix

		CCC	ROE	ROA	TA	Sales.
CCC	Pearson Correlation	1	-0.031	-0.11	-0.065	0.022
	Sig. (2-tailed)		0.71	0.188	0.437	0.795
ROE	Pearson Correlation	-0.031	1	0.127	-.217**	-0.137
	Sig. (2-tailed)	0.71		0.128	0.009	0.101
ROA	N	145	145	145	145	145
	Pearson Correlation	-0.11	0.127	1	-0.031	0.023
TA	Sig. (2-tailed)	0.188	0.128		0.713	0.786
	Pearson Correlation	-0.065	-.217**	-0.031	1	.567**
SZ	Sig. (2-tailed)	0.437	0.009	0.713		0
	Pearson Correlation	0.022	-0.137	0.023	.567**	1
	Sig. (2-tailed)	0.795	0.101	0.786	0	

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

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

Source: Author's own calculation

The analysis shows that there is an insignificant and negative correlation between the cash conversion cycle and asset of the firms. With the sales there is an insignificant but the positive relationship between the cash conversion cycle (CCC). It means that CCC of firms in the sample does not consider firm size. If CCC is favorable it is not because of total assets and total sales. There are other factors which are responsible for the favorable CCC which may be efficient working capital management.

Relationship of CCC with the firm's profitability

Return on the Asset (ROA) and the Return on Equity (ROE) two measurements of profitability to check the relationship of cash conversion cycle and the profitability. Pearson correlation analysis is to be conducted for checking the relationship between the cash conversion cycle and profitability. The result indicates that there is a negative relationship between profitability and cash conversion cycle. But this relationship is also insignificant. It shows that cash conversion cycle does not affect the profitability of the firms of the sample. Results of Pearson's correlation show that relationship of Cash conversion cycle with profitability and size is insignificant, if a firm maintain good Cash conversion cycle then this favorable CCC does not has a positive impact on profitability and size of the firm.

Regression Analysis

To check the relationship of Cash conversion cycle with size and profitability one more statistical tool is applied that is regression analysis. The regression analysis is showing the same picture which we observe in the correlation matrix.

Table 4. Regression Model

Variables	Coefficients	Std. Error	t-stat	Sig.
ROE	-2.136	5.759	-0.371	0.711
ROA	-1487.3	1120.357	-1.328	0.186
TA	-0.007	0.005	-1.242	0.216
Sales	72.688	79.873	0.91	0.364
	0.024			
R Square				
Adjusted R Square	-0.004			

Source: Author's own calculation

ROE and ROA are taken as a measure of profitability and the relationship of Cash conversion cycle with these two measures is negative but insignificant relationship. Negative coefficients of ROE and ROA are showing the negative relationship but t-stat and p-value against these measures shows the relationship is insignificant. Our finding is against the work of (Josse *et al.*, 1996) who said that there is significant and negative relationship between profitability and Cash conversion cycle. Same results are observed in the case of total assets and sales. The negative coefficients of both measures of size are negative but values of t-stat and p-value shows that this relationship is insignificant. Our findings are against the predictions of (Stine and Moss, 1993) who found that the Cash conversion cycle is shorter of larger firms.

5. Conclusions

The basic purpose of this article is to checking the time lags of cash conversion cycle with respect to the working capital. The data is collected from the listed companies from the Karachi Stock Exchange that is International stock exchange. The positive thing of the study is that all the companies have negative CCC it means they have shorter Cash Conversion Cycle (CCC) time which is favorable for the any firm. The tobacco industry has the shortest period of CCC as compare to other industries like paper, textile and transportation industries. All others industries should also shorten their CCC to manage the working capital efficiently and increasing the profit level. Moreover the findings indicate that there is a negative and not significant relationship between the length of the CCC and the firm's assets; whereas the relationship of the length of the CCC to the firm sales is positive but not significant.

The last part of the findings shows that there is an insignificant negative correlation between the length of the cash conversion cycle and with the profitability. It means that the firms with longer cash conversion cycle (CCC) have less profitability. The main reason of this factor is that the firms are slow in receiving there receivables from the customers, slow to sells the inventories and quick to pay their short terms and long terms debts. Results of our study show that there is insignificant relationship between profitability and Cash conversion cycle. Theoretically there should be a positive relationship between cash conversion cycle and profitability. In case of favorable Cash conversion cycle the firm receives its receivables earlier than payments of liabilities. If Average collection period of a company is lesser than its Average payment period then that company can invest for short term. This short term investment can increase the profitability of

the firms, but results of our study shows those favorable answers of Cash conversion cycle does not affect the profitability of the firms which are taken in sample. The same results are shown in the relationship of Cash conversion cycle and Size.

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