



The Relationship between Modified Cash Conversion Cycle & Firms' Profitability

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Abstract

The paper aims to study the influence of modified cash conversion cycle (mCCC) on the earnings of the; companies in three different sectors of Pakistan includes Automobile, Pharmaceutical and Cement industry. The study uses a panel data from 2009 to 2018 by employing a panel regression model to analyze data covering fourteen registered companies operating in three different industries. The main findings provide empirical pieces of facts that mCCC considerably affects profitability. Moreover, the, firm-level control variables size, significantly affects firm profitability while debt ratio and growth are an insignificant impact.

Findings suggest that efficient working capital policy enhances firm's performance. Profitability can be improved by plummeting mCCC as an improved working capital policy positively affects the firm's value. These practical implications can add value to the existing knowledge of working capital management through the application of panel regression technique to the panel data of three different industries in Pakistan to introduce the concept of the modified cash conversion cycle.

Keywords: Modified cash conversion cycle, firm size, Firm growth ratio, earning per share, liquidity, debt ratio, panel regression

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Introduction

Working capital is a foremost determinant of Profitability and liquidity of an enterprise and its management is a key financial management function. Sufficient amount of working capital is needed either firms are profit making entity or not, regardless of the type and size of firm (Achchuthan & Kajanathan, 2013). Recent intensification in the competition has brought the notice to the explanation of the short run investment offers a significant task to the working capital management of the firm's performance (Appuhami, 2008; Ajilore and Falope, 2009; Banos-Caballero et al., 2011; Jose et al., 1996; Shin and Soenen, 1998; Lazaridis and Tryfonidis, 2006;). In particular, from the view point of investments, it requires a substitution between return and risk. Cash conversion cycle significantly contributes to manage working capital (Gitman, 1974). Decision regarding size of investment in inventory and customer accounts, credit limit of supplier is revealed in the firm's cash cycle. It is the period when cash outflow from the firm till the cash inflow in the firm and it measures the working capital management (Ebben and Johnson, 2011).

In the past few years' firm's interest in working capital has increased due to global financial crisis. For practitioners deal with its prediction, included new variable in the calculation of cash cycle. Beside traditional cash conversion cycle i.e. DIO, DSO & DPO new measure introduce by adding the new variable i.e. cycle time of advance (Karri Timo et al. in 2013).

Account receivable, payable, and inventory turnover time are key drivers of traditional cash conversion cycle and the significant drivers of working capital. However, there are many variables which are vital in efficient operational working capital management, advance payment is the example.

An advance payment is a significant driver of working capital. It is trade flows bargain between a customer and the supplier. In those companies or industries where advance payments have greater weight on the balance sheet should be included. Modified cash conversion cycle is more

significant from traditional cash conversion cycle. Many firms have weight-age of advance payments received, so advances should be included in the computation of cash cycle. In those companies where advance is regularly received so modified cash conversion cycle provides accurate picture of cash cycle.

This study aims to examine the association between modified cash conversion cycle (mCCC) and corporate earnings using panel regression three different industries of Pakistan automobile, cement & pharmaceuticals. According to results modified cash conversion cycle (mCCC) inversely affect earnings of the in three industries in Pakistani namely Automobile, Pharmaceuticals & Cement.

Furthermore, this issue was examined in large countries in most previous researches (e.g. Jose et al., 1996; Shin and Soenen, 1998). Cash cycle is appropriate variable in measuring the working capital but it does not provide accurate picture in all the industries. There is no previous study which uses the (mCCC) to measure its effects on firms' profitability, especially in the context of Pakistani Automobile, Pharmaceuticals & Cement industries. This research gap motivates the researcher to address the issue and contribute to the existing body of knowledge.

Literature Review

Nobanee, Abdullatif & AlHajjar (2011) investigate, as cash cycle and firm's profitability from Japanese companies. Data was collected from 2,123 nonfinancial firms of listed companies from Tokyo Stock Exchange, between 1990 to 2004 and sample containing missing data, which was omitted. GMM (Generalized method of moment system estimation) technique was performed on selected data. There is an important inverse association between the net operating cycle and the investment returns.

Short cash conversion cycle results in higher profitability in different size of companies. The researchers, on behalf of the findings, suggest that working capital manager can enhance a company's performance. Yazdanfar & Öhman (2014) also supports previous research, such as the influence of the cash cycle on company profitability, an experimental study in Sweden. The days of receivable, inventory turnover and days of Payable are independent variables, and company size and age are the control variables of this study. Data was obtained from 23,000 companies, which are neither financial institution nor registered in Sweden. To judge the association between independent and dependent variable, seemingly unrelated regression model. Optimize the net working capital management (WCM) lowers the organization financial risk and improve the company's performance. By improving working capital policies, companies can increase their cash flow, thereby contributing to the profitability of the business.

Vural, Sökmen & Emin Hüseyin (2012) also discuss as past results, the weight of working capital on firms' performance in Turkey also discussed. Dynamic panel data and correlation methods are applied to establish the association among variables. Results suggest substantial association among the working capital and corporation's performance.

Vahid, Elham, Mohsen & Mohammad reza (2012) define the relationship in 2012 which is in support of previous researches, from companies in Iran. Data collection was done from the annual financial statement of 50 companies for the duration of 2006 to 2009. Operating profit, cash cycle, net trading cycle, company growth, company debt, total asset ratio is the variable used in this paper. Multiple regression technique used in this paper for findings the relationship. Result show that performance in term of profitability is negatively related with management of working capital. Shah & Khan (2012) also recommended the bonding among variables as, consequence of working capital policy on corporation's performance in Pakistani textile industry. Data collected from 46 listed textile firms during 2003 to 2009. Regression model is used for finding the relationship among

variables. Cash conversion cycle negatively related with return on assets. Proper allocation of company's resources positively affects the company performance and growth. Khan & Ghazi (2013) perform the studies in chemical sector of Pakistan. Cash conversion cycle, leverage, growth rate, fixed financial asset and gross domestic product are the variables used in this paper. Data collection was done by the annual financial statement of twenty-two firms registered with Karachi Stock Exchange (KSE) of chemical sector for over six years i.e. 2005 to 2010. Descriptive statistics and Tobin's Q techniques used in this research for analyzing the relation among the variables. The study concluded inverse relationship between operating gross profit and cash cycle. After global crisis trend to manage the long term investment as well as short term investment increased which create stable position of the company.

Aghajani, Mahmoudian, & Zabihi (2015) also input their findings in support of previous studies at to some extent as, the rapport among the cash cycle and businesses profitability registered in stock exchange of Tehran (industry wise importance). Cash cycle, debt, growth, size is the independent and control component of this study on the other side business profit as earning per share is the dependent variable used in this study. Data was gathered from 53 enrolled organizations for the time duration of 10 years (2002 to 2012) of three different sectors (sixteen companies from Automobile industry, 20 companies from pharmaceuticals industry & seventeen companies from cement industry) from the stock exchange of Tehran i.e. (TSE). Multivariate linear regression as probe technique used in this study to find out the rapport among variables in defined industries. Observations from study conclusions that inversely significant association between cash cycle and business profit in cement industry and automobile industry on the other hand, variables of pharmaceuticals company have not significantly related. Industry type effect the outcome as in this case pharmaceuticals industry totally depend on other foreign country due to technology, knowledge & raw material and also political and economic factors behind it. Hill, Kelly & Highfield (2010)

slightly differ from others in 2010 as net operating working capital. Data was collected from 3,343 companies (20,710 observations) for the period 1996 to 2006 missing data was omitted. Sales growth, contribution margin, sales, financial distress, market power, capital market assess, cost of external financing & operating cash flow are the variables used in this paper. In this study limited scope of direct correlation between gross profit margin and working capital requirement and also stated that financing capabilities affect the working capital behaviour.

Bellouma (2011) also in the current trend and probe the weight of efficient working capital policy on business improvement (a case from medium small size export enterprises from Tunisia). Gross profit, cash cycle, export & size used as variables in this study. Data was gathered from the financial statement of medium small size export enterprises of Tunisia for the time duration of 2001 to 2008 of 386 listed corporations. Panel regression as evaluation technique used in this paper by the help of Hausman test (appropriate model is also identified). Inversely substantial rapport found among the gross profit & cash cycle. The outcomes also suggest that efficiently working capital and resources management, increases existing goodwill. Working capital affects the Belgian companies' profit.

Gross income, net income, cash cycle, debt, sales variability and fixed financial assets are the dependent and independent components used in this study. This information has been compiled into National Bank of Belgium financial accounts from 1991 to 1996. The Pearson correlation is applied in this article. Result suggests that considerable association between the cash cycle and operating profit (Deloof, 2003). Juan García-Teruel & Martínez-Solano (2007) explained how working capital affects the profitability of Spanish small medium size enterprises. Leverage, firm's size, firm's growth & cash conversion cycle included as factors in this research. Panel data are collected from nonfinancial firms (small medium enterprises) of Spanish from 2002 to 2007. The study concluded that cash conversion cycle and leverage inversely associated with the company's earnings financial

statements in Spanish of small medium enterprises are reduced so that's why financial statement provides less detail so provide complete detail for future studies. Gill & Biger (2012) had drawn the similar conclusion in support of previous studies using the data of American manufacturing firms. Firm size, performance, internationalization, sales growth, account payable & receivable, inventory, current ratio, cash cycle, cash holdings, and efficient cash conversion were used. Data collected from the manufacturing firms of seven industries from 2009 to 2011; Out of 500 companies only 180 financial statements are usable for this research so data consist of 540 observations.

Another study concluded that corporate governance is a crucial determinant of working capital in US firms. Similar to past researches Growth rates, revenues, inventories, payments, cash cycles, liabilities and asset returns were the variables used in this study (Juan García-Teruel & Martínez-Solano, 2007). Data was collection from the European companies, economic and financial database. After omitted outliers from the data, panel data consist of 38,464 observations for the period of 1996 to 2002. Generalize least square technique used in this paper for finding the relationship among the reliant variable and independent variables. Small medium enterprise has significantly inverse association between profitability, times inventory and days of account receivable.

Wasiuzzaman (2015) also supports that net operating working capital negatively impact the firm value. Conservative working capital strategy attracts investors for financing so design policy in the interest of investors. Variables used included are receivables, inventory, payables, cash cycle, and return on assets. Data was gathered from the fifty-eight small manufacturing firms from 1998 to 2003, panel data of 348 observations used in this study. Result of regression determines that earning can be increased by shorten the cash cycle (Padachi, 2006). Sharma & Kumar (2010), in contrary to other supportive researches, disclosed that the, shorten the cash cycle negatively affect the profitability. Lazaridis & Tryfonidis (2006) observed the link between working profitability and

capital of registered businesses in the equity market of Athens. Financial debt ratio, cash cycle & operating profit are the variables. Because of reliability and accessibility of financial statement data was gathered from the 131 registered companies of stock exchange in Athens for four years (2001 to 2004). Total number of observation in this study is five-hundred and twenty-four observations. Regression analysis was done to examine the correlation between the company's performance and cash cycle. Study statistically support that the noteworthy association between the gross profit and cash cycle. Bandyopadhyay and Barua (2016) find that any company's performance depends on its ability to leverage operations.

Devereux et al. (2018) find a positive and significant effect on the capital structure of long-term income tax. Given Sukhtankar's (2016) research on the Indian background, upstream suppliers' economic results were contrasted with cooperatives and public mills by private owned sugar mills, and a positive result was found.

Vo and Ellis (2017) empirical shreds of evidence analyze the capital structure and shareholder-value relationship of the Ho Chi Minh City stock exchange. Their analysis shows a negative relationship which indicates that low leveraged companies are likely to generate value for shareholders. Likewise, Rahman and Rajib (2017) reviewed index and business performance revisions and noticed a significant relationship between business performance and leverage. Rahman and Rajib (2018) analyzing index revisions and equity capital costs observed a negative association between leverage and equity costs.

Variable selection

The dependent variable is profitability of the firm represented as a earning per share. Independent variables are classified as the main include modified cash conversion cycle and control variables are size, debt ratio and growth of a firm. The dependent variable: profitability &

Independent variable: modified cash conversion cycle. We can define modified cash conversion cycle as:

$$mCCC = CCC - DAO \dots\dots\dots (1)$$

$$CCC = DIO + DSO - DPO \dots\dots\dots (2)$$

On the basis of previous study we find the inverse association between the cash conversion cycle profitability and profitability (Al Hajjar Maryam, Abdullatif Modar & Nobanee Haitham, 2011; Ohman Peter & Yazdanfar Darush, 2014). We define firms’ profitability as earning per share as on previous studies (Aghajani, Mahmoudian, & Zabihi, 2015).

Control Variables

Mainstream past researches uncovered the direct link between the firm size and profitability (Vijayakumar and Tamizhselvan, 2010; Garcia-Teruel and Martinez-Solano, 2007; Mathuva, 2014). Therefore, we establish the following hypothesis.

$$Size_{j,t} = Ln(Sale_{j,t}) \dots\dots\dots (3)$$

Most of the past studies considered the direct link between sales growth and the firms’ profitability (Robson and Bennett, 2000; Cox et al., 2002; Liu and Hsu, 2006; Cowling, 2004). Firm size can be calculated by log of sale of (i) company for (t) year, and (Ln) represent the log of sales. Sales growth of the company can be calculated by net sale less previous year sale and the result after subtracting will be divided by previous year sale.

$$g_{i,t} = (S_{i,t} - S_{i,t-1}) / S_{i,t-1} \dots\dots\dots (4)$$

$g_{i,t}$ = growth of i company, year t

$S_{i,t}$ = Net sales of i company, year t

$S_{i,t-1}$ = Net sales of i company, year $t-1$

Previous studies have a disagreement about the relationship between the leverage and the profitability. Studies show negative are (Samuel & Baker, 1973; Wald, 1999; Sheel, 1994), in the favor of positive relationship includes (Larry & Stulz, 1995; Mangalam & Govindasamy, 2010). So mostly we can say results are in favor of negative relationship in different studies, we will expect inverse relationship between leverage and firm profitability. Debt ratio can be calculated as, the total liabilities divided by total assets.

$$Debt_{i,t} = TL_{i,t} / TA_{i,t}$$

TL = Total liabilities & TA = Total assets

Methodology

Data and sample

Secondary data was collected from published financial reports from the Karachi Stock Exchange or company’s official website of the three different industries automobile, pharmaceutical & cement for the period 2009 to 2018. For cement industry we have seven companies which are Attock Cement, Lucky Cement, Pioneer Cement, Kohat Cement, Maple Leaf Cement, Gharibwal Cement, and Fauji Cement. For automobile we also have five companies including Millat Tractors, Atlas Honda, Pak Suzuki, Gandhara Nissan Ltd and Indus Motor. For Pharmaceutical sector include six companies are Ferozsons, Otsuka Pakistan, Sanofi-Aventis, Highnoon, GSK (GlaxoSmithKline) and Abbott Laboratories. Panel data regression model is applied for the data analysis.

Model Specification

$$EPS_{i,t} = \beta_0 + \beta_1 mCCC_{i,t} + \beta_2 Size_{i,t} - \beta_3 Debt_{i,t} + \beta_4 Growth_{i,t} + \mathcal{E}_{i,t} \dots \dots \dots (5)$$

Where *EPS* is earning per share represent firms' profitability, *mCCC* is modified cash conversion cycle, *size*, *debt ratio*, and *growth* of the firms' for *i* company and *t* year. & ε is residual of regression equation. Managers can control the company's profit by proper handling of cash cycle.

Methodology

The panel regression model technique used for data analysis in this study. Data comprises across the space and time both (Brooks, 2015). Below are the techniques for analyzing on-board data. Seemingly unrelated regression (SUR) initially suggested by Zellner (1962). It is commonly used in the finance where numerous closely associated variables modeled over the time. Fixed effect models permits the intercept vary cross-sectionally in the regression model but not over the time, however the slope estimates both over the time and cross-sectionally are fixed. This approach is superior to SUR evidently (Brooks, 2015). Alternative to fixed effect model is random effect model which also known as error component model is different from the fixed effect in that it is assumed that intercept of each cross-section result from a common intercept α which is constant over the time and cross-sectionally in addition to a random variable i that changes across the time and the entities (Brooks, 2015).

Results

Random Effect Model

- a. Random & Fixed effect model.
- b. Seemingly unrelated regression (SUR).

Hausman test (Table.1) suggest the Random effect model because p-value is greater than 5%.

Results from the Table.2 suggest negative significant influence of modified cash cycle of the business on company’s profitability results are in line with (Zabihi, Aghajani & Mahmoudian, 2015, Bellouma (2011); similar to Bandyopadhyay and Barua (2016); Rahman and Rajib (2018) positive significant influence of growth on companies Profitability, positive significant effect of size and negative significant relationship of debt ratio on the profitability, contrary to Vo and Ellis (2017); Rahman and Rajib (2017). As the P-value of debt, growth, size and mCCC is less than 5% level of significance, we can reject the null hypothesis. Furthermore, the debt and mCCC have negative coefficient sign, which implies negative relationship between debt and mCCC on firms’ profitability. However, growth and size have positive coefficient sign, which implies positive relationship between size and growth on firms’ profitability

Table 1: Hausman Test

Test Summary	Prob.	Chi-Sq. Statistic	Chi-Sq, d.f.
Cross-section random	0.6154	2.664	4

Table 2 – Result of Random Effect Model

Dependent Variable = EPS				
Method : Panel EGLS (Cross-section random effects)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.9870	7.9268	0.3768	0.7067
GROWTH	0.8098	0.25488	3.1774	0.0017
SIZE	2.0091	0.75914	2.6466	0.0088
MCCC	-0.0345	0.01487	-2.3199	0.0214
DEBT	-16.496	5.01467	-3.2897	0.0012

Conclusion

Cash conversion cycle is useful tool to assess performance of the firms but trend of receiving advance payment has increase so modified cash conversion cycle provide accurate picture. In this

study we examined the relationship between modified cash conversion cycle (mCCC) and the firm's profitability in three different industries of Pakistan, which are automobile, cement & pharmaceuticals. To achieve the aim of the study we use the panel regression model. According to the results there is significant negative impact of the modified cash conversion cycle (mCCC) on companies' performance in term of earning per share in all three industries (Automobile, Pharmaceuticals & cement).

On the basis of the results, we can conclude that shorten the cash cycling process increase businesses performance. In other words collection period and selling period should be shorter on the other side payment period and goods delivery period (against advance payment received) should be longer to increase businesses performance.

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