

Determinants of Working Capital Management: Evidence from Ethiopian Corporate Sector

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ABSTRACT

Working capital management is an integral part of the overall management of a company. Its efficient management is believed to be detrimental to its survival. This study was conducted to investigate determinants of working capital management in Ethiopian corporate sector. Secondary data (income statement) and balance sheet of 353 companies from the period 2005 to 2014 were included. It used cash conversion cycle as a proxy for working capital management efficiency. The correlation and regression results showed that firm size, operating cash flow, asset tangibility have positive influence on cash conversion cycle, and leverage affects ccc negatively. However, asset tangibility has weak significance (10%) while the remaining are significant at 1%. Therefore, firms in Ethiopian corporate sector can improve their working capital management efficiency by focusing on the above variables.

Keywords: cash conversion cycle, determinants of working capital management, working capital, working capital management.

INTRODUCTION:

Working capital management is an important component of the overall management of a company (Nazir & Afza, 2008). It refers to the management of current assets and current liabilities. There are different reasons that make it an important topic of study. Managers spend most of their time on managing the working capital of their firm (Horne and Wachowicz, 2004, Lamberson 1995, Pandey, 2005, and Rao, 1989. Besides working capital affects profitability of firms (Weston and Coperland 1986). Further, according to Smith (1973) it influences the value (net worth) of a company.

Working capital management decisions are influenced by different internal and external factors. These factors are commonly termed as determinants of working capital management. According to Padachi (2006) the composition of working capital depends on a multiple factors including operating level, level of operating efficiency, inventory prices, debt policies, technology used and nature of the industry. Furthermore, Nwankho & Osho (2010) stated that industry practice, corporate size, proportion of a firm's assets in long term and current assets, market share, nature of business, and business environment are significant determinants of working capital management in an organization. Investment in working capital varies on the nature of the firm and its industry. For example, while trading and financial firms have a very small investment in fixed assets but require a large sum of money to be invested in working capital, some manufacturing and construction firms have to invest substantially in working capital and only small amount in fixed assets. Public utility companies, however, may have limited need for working capital and have to invest larger amount in fixed assets.

Most of manufacturing companies will fall between the two extreme requirements of trading firms and public utilities for their working capital requirements Pandey (2005). Hawawini et al. (1986) strengthened this argument by stating that the operating working capital policies of manufacturing firms is totally different from service firms since the former typically carry substantial inventory levels while the latter invest almost nothing in inventory. Each industry has its own working capital policy which varies from one to the other Weinraub and Visscher (1998).

A number of studies were conducted to examine the determinants of working capital management and provided mixed results. For example according to Afza and Nazir (2007) operating cycle, leverage, ROA, and Tobin's q are the internal factors that significantly influence working capital management. It is also found to differ among industries. However, no relationship was found with the level of economic activity, size of the firm, and sales growth with working capital management. But Moussawi et al. (2006) indicated firm size and growth opportunities influence working capital management, but not by industry. Uyar (2009) found negative significant relationship between firm size and working capital management. Lyroudi & Lazardis (2000), however, found no significant relationship between CCC and leverage and firm size..

Although working capital management is an important aspect of the management of a firm. Study in this area, in Ethiopian companies context, is scant. The few studies done on working capital management focused on investigating effects of working capital management on profitability. However, to the best knowledge of the researcher, there are no studies that investigated the determinants of working capital management in Ethiopian firms. This study tried to fill the above research gap. Therefore, the purpose of this study is to investigate the determinants of working capital management in Ethiopian corporate sector.

LITERATURE REVIEW:

Moss and Stine (1993) studied the link between the cash conversion cycle with firm size and cash flows for a sample of 1,717 retail firms. The study covered 20 years from 1971 to 1990. Firm size was measured by two variables viz. net sales and total assets. The study used five groups of retail companies based on their size. The findings indicated that larger retail firms were found to have better working capital management as indicated by the significant longer CCC for the smallest 20% of sample companies. Further, smaller firms were found to have longer inventory and receivables period as well as longer payables period than larger companies. The study also found significant negative relationship between CCC cash flow while its relationship with liquidity measures (current and quick ratios) was significant and positive.

Moussawi et al. (2006) examined the level of investment in working capital and on the factors influencing corporate working capital management. They used a panel data from a sample of U.S. public corporations for the period from 1990 through 2004. Regression analysis was used for the investigation. Their findings showed that U.S. firms, on average, have over invested in working capital, which means, additional investment in working capital is associated with reduction of firm value. Besides this, they investigated the factors that influence the management of working capital. The regression analysis results revealed that the inefficiency of a firm's working capital management is positively correlated with firm size and uncorrelated with its industry concentration. Similarly, they found that future sales growth, the proportion of outside directors in the board, executive compensation (current portion) and chief executive officer share ownership significantly influence the efficiency of a company's working capital management.

The 2006 analysis by Chiou et al. focused on the determinants of working capital management by using the net liquid balance (NLB) and working capital requirements (WCR) as proxies for working capital management. Their study explored how different variables like business indicators, industry effect, operating cash flows, growth opportunity for a firm, firm performance and size of firm affect its working capital management. Empirical results showed that leverage and operating cash flow provide consistent results for both net liquid balance and working capital requirements, however, variables like business indicator, industry effect, growth opportunities, performance of firm, and size of firm were unable to produce consistent conclusions for net liquid balance and working capital requirements of firms.

The study by Jeng-Ren et al. (2006) tried to investigate the determinants of working capital management of companies in Taiwan. The study used financial data of 35 quarters for the period from 1996 to 2004. The dependent variable, working capital management, was measured by net liquid balance (NLB) and working capital requirements (WCR). The independent variables used in the study were business indicator, industry effect, debt ratio, growth opportunities, operating cash flow, firm performance and firm size. The results showed that significant positive relation for NLB with economic recession which indicate that the company maintain higher net liquid balance in the time of recession. Net liquid balance was also found to have significant positive relations with operating cash flow, firm size, growth opportunities and firm performance. On the contrary, there is a significant negative relation between net liquid balance and debt ratio. The study also found negative relations for business indicator and recession, debt ratio and operating cash flow with working capital requirement. On the other hand WCR was significantly positively relations with firm age, firm performance and firm size.

Nazir & Afza (2008) explored the determinants of working capital management of firms. They used panel data from non-financial listed companies at Karachi stock exchange in Pakistan for the period from 2004 to 2007.

They included working capital requirements as a dependent variable and variables like operating cycle, operating cash flow, the level of economic activity in the country, growth, return on assets, Tobin's q, leverage, size and industry dummy as independent variables. The regression model found that the operating cycle, leverage, ROA, and q are the internal factors that significantly influence working capital requirements. Working capital practices were also found to differ among industries i.e. different industries exhibit different working capital requirements.

Appuhami (2008) tried to investigate the impact capital expenditure on working capital management using 416 non-financial firms registered in the Thai Stock exchange for six years period from 2000 to 2005. Working capital management was measured using two variables – WCR and NLB. It also included control variables were operating expenditure, financial expenditure, market to book value ratio, total debt to total assets, sales growth and operating cash flow. The pooled regression results indicated that capital expenditure has positive significant relationship with net liquidity balance. Besides, while significant positive relationship was found for operating expenditure and operating cash flow; financial expenditure had a negative and significant value. But no significant relationship was found for leverage and performance variables. On the other hand, regarding the second measure (WCR), the study found a significant negative relationship with capital expenditure and operating cash flow. And operating expenditure and interest expenditure were related to WCR significantly positively.

Mathew et al. (2009) studied the behavior of net operating working capital using 3343 companies over the 1996 to 2006 period. They used working capital requirements as a dependent variable. Their findings provide evidence on the existence of strong relationships between net operating working capital and operating conditions (e.g., sales growth and sales volatility). Accordingly, working capital requirement depends on internal financing resources, external financing costs, capital market access, negotiating ability, and financial distress. As a result, while sales growth, uncertainty of sales, costly external financing, and financial distress encourage firms to pursue more aggressive working capital strategies, firms with greater internal financing capacity and superior capital market access employ more conservative working capital policies.

Azhar et al. (2013) examined public listed companies in Malaysia. The study used 150 listed companies from seven different sectors for 10 years period. The data was analyzed using correlation and pooled OLS methods. The variable debt is found to be significantly negatively associated with both cash conversion cycle and working capital requirement. While capital expenditure showed positive and significant relationship with ccc, its relationship with wcr is significant and negative. In addition free cash flow revealed negative significant association with ccc and positive significant relationship with wcr.

Finally, Jean et. al. (2014) tried to investigate the factors determining working capital management in Kenya. The study focused on small and medium size enterprises in Nairobi. The researchers used primary and secondary sources of data. Using descriptive and inferential analysis they showed that (1) there is positive and significant relationship between working capital management practices and variables such as accounts receivable, accounts payable and cash conversion. (2) enterprises used credit for purchases and sales, this is found to have affected their cash flows and hence their ability to repay maturing obligations. Besides, enterprises obtained finance from banks, micro finance institutions, and shy locks.

METHODOLOGY:

Nature and source of Data:

This study used secondary data i.e. income statement and balance sheet. Ethiopia doesn't have stock exchanges. As a result there is lack of central data base system. But corporations and private limited companies in the country pay taxes to the federal government. Hence, the simpler means of obtaining financial statements is to use the data base of Ethiopian revenue and customs authority (ERCA). This database has data of all companies that fill their tax returns with it. The data was collected in person after getting permission from the authorized person in the authority. A total of 353 companies involved in manufacturing and merchandising businesses were included. To select sample, purposive sampling method (using set of criteria) where any company eligible based on these criteria was included.

Method of Analyses:

To analyse the data descriptive, correlation and multivariate regression analyses were used. The different statistical figures were calculated using STATA version 13. The crude data, from the financial statements of sample companies, were found in excel form and the variables of interest were calculated with the help of it. Then after the data were transferred to STATA in which analyses were made.

Definition of Variables:

In any research it is very difficult to include all variable that might affect a desired relationship. For this reason, it is necessary to identify variables that are believed to have strong theoretical and empirical justification for the study. Based on this, the variables for this research are selected after consulting the existing literature.

Cash Conversion Cycle (CCC) – is a measure of working capital management efficiency. It is a measure of the overall working capital management of a firm. The following formula was used to calculate it:

$$CCC = IP + ARP - APP$$

Therefore, the cash conversion cycle has three components viz. the inventory period, the accounts receivable period and the accounts payable period. Each of the components of the CCC were defined and computed as follows:

Inventory Period (IP) – is defined as the length of time (in days) that a firm takes to convert raw materials to finish goods and then to accounts receivable. It is the length of time between purchases of inventories up to its sale. It is computed as shown below

$$IP = \frac{\text{Inventories} \times 365}{\text{Cost of Goods sold}}$$

Accounts Receivable Period (ARP) – refers to the number of days that accounts receivable remains uncollected. That means the number of days that a firm, on average, should wait to collect its accounts receivable into cash. The formula to calculate this figure was

$$ARR = \frac{\text{Accounts Receivable} \times 365}{\text{Sales}}$$

Accounts payable Period (APP) – the accounts payable period is defined as the length of time, in days, elapsed before a firm pays its liability on purchases. It is computed as

$$APP = \frac{\text{Accounts Payable} \times 365}{\text{Cost of sales}}$$

Firm Size (LnSal): firm size is a proxy for access to finance. Following Deloof (2003) it is measured as the natural logarithm of sales.

Firm Growth (Grw) – firm growth is the rate of growth of a company measured by change in its annual sales. It is computed as:

$$Grw = \frac{\text{Sales}_t - \text{Sales}_{t-1}}{\text{Sales}_{t-1}}$$

Leverage (Lev) – leverage is a measure the extent to which a firm uses debt financing. It was calculated by dividing total debt to its total assets as follows:

$$Lev = \frac{\text{Total Debt}}{\text{Total Assets}}$$

Operating cash flow (OCF) – Operating cash flow is a measure of the operating efficiency of a company. It is the ability of a company to generate cash flows from operations. It was computed as:

$$OCF = \frac{\text{EBIT} + \text{Depreciation} + \text{Taxes}}{\text{Total Assets}}$$

Asset Tangibility (ATan) – represents a firm's investment in fixed assets. It was calculated as the proportion of fixed assets to total assets as:

$$OCF = \frac{\text{EBIT} + \text{Depreciation} + \text{Taxes}}{\text{Total Assets}}$$

Manufacturing (Man) – is a categorical variable that represents manufacturing companies. It is a dummy variable used to differentiate manufacturing companies from their merchandising counterpart. It takes the value of 1 were as the merchandising are assigned the value of zero.

$$CCC_{ij} = \alpha + \beta_1 Grw_{ij} + \beta_2 Lev_{ij} + \beta_3 Atan_{ij} + \beta_4 OCF_{ij} + \beta_5 \ln Sal_{ij} + \beta_6 Man_{ij} + e_{ij}$$

where

CCC – cash conversion cycle

Grw – firm growth rate

Lev – leverage

OCF – operating cash flow

LanSal – natural logarithm of sales

Man – dummy for manufacturing sector (1 for manufacturing and 0 for merchandising)

β_{1-6} – coefficients to be estimated

α – constant

e – error term

i – time dimension, runs from 1 to 10

j – cross section of companies, runs from 1 to 353

To see effects of those variables on the specific measures of working capital management, the CCC was replaced by IP, ARP and APP separately.

ANALYSES AND DISCUSSION:

Descriptive Analyses:

The mean values of the cash conversion cycle is 55.3 days. It means on average, sample companies need additional working capital for around 55 days. While the minimum and maximum values for this variable are -382.1 and 6441 days respectively with standard deviation of 344. Leverage has mean value of 58%. Its minimum and maximum values are 0 and 1 respectively with standard deviation of 0.27. Firm growth and firm size have mean values of 1.109 and 16.687 respectively. While minimum and maximum of growth are -.9 and 630 respectively, it is 7.5 and 23 for that of size of firm. Growth of firm has higher variability (13.9) than firm size (2.2). Asset tangibility and manufacturing (dummy) have mean values of 0.16 and 0.23 respectively. The minimum values is 0 in both cases and the maximum for asset tangibility is 1.7 and for manufacturing it is 1. Relatively, the variable manufacturing has higher variability than tangibility of assets.

Table 1: Descriptive statistics

Variable	mean	min	max	Std. deviation
ccc	55.30	-381.2	6440.7	344.084
lev	.581	0	1	.268
grw	1.109	-.9	630.18	13.855
lnsal	16.687	7.5	23	2.229
ocf	1.274	-7.7	134	4.738
atan	.162	0	1.7	.178
man	.255	0	1	.436

Source: STATA Output

Correlation Analyses:

Table 2 shows the correlation matrix of variables used. As can be seen from the table, cash conversion cycle has positive correlation with operating cash flow and asset tangibility. These results mean that the length of the cash conversion cycle increases with increase in cash flow from operations and asset tangibility. On the other hand, it has negative correlation with leverage, firm size, firm growth and manufacturing. The interpretation is that cash conversion cycle decreases with increases the level of debt, size of company, growth of company and the dummy manufacturing. Correlation results for leverage show a positive one with firm size and negative with the remaining variables. The debt level of sample companies increases when firms grow larger. Besides, the negative correlation indicates debt levels of sample companies decline with increases in growth of firms, operating cash flow, asset tangibility and the dummy manufacturing.

Table 2: Correlation matrix

	ccc	lev	lnsal	grwn	ocf	atan	man
ccc	1.0000						
lev	-0.0459	1.0000					
lnsal	-0.0128	0.0303	1.0000				
grw	-0.0014	-0.0400	-0.0115	1.0000			
ocf	0.2130	-0.0450	-0.1772	-0.0082	1.0000		
atan	0.0029	-0.0037	0.0417	-0.0118	0.0356	1.0000	
man	-0.0111	-0.1154	0.1044	-0.0027	0.0627	0.2795	1.0000

Source: STATA Output

Besides, firm size is negatively correlated with firm growth rate and operating cash flow and positively with asset tangibility and manufacturing. It means while size of a firm increases with increase asset tangibility and the more the company involves in manufacturing, it decreases with firm growth rate and operating cash flows. Furthermore, growth of firm is negatively correlated with operating cash flow, asset tangibility and manufacturing. So, increases in operating cash flow, asset tangibility, and the dummy manufacturing decrease the growth of firms. Similarly, operating cash flow is positively correlated with both asset tangibility and manufacturing. Further, asset tangibility is correlated with manufacturing positively. As stated earlier positive correlation means an increase in one variable is associated with increase in the other one and the vice versa.

Regression Analyses:

To select between fixed and random effect models, hausman test was run. The test result is in favour of fixed effect model. The regression results and discussion thereon is provided in table 3 below.

Table 3 reveals leverage, size of firm, operating cash flow and asset tangibility are the variables that affect the size of the cash conversion cycle. Leverage has a significant negative relationship with cash conversion cycle at 1% level of significance. That is, other things remaining constant, a 1 unit increase in level of debt decreases the cash conversion cycle by 301 units.

Table 3: Regression Results – dependent ccc

ccc	coef.	std. err.	t	p>t
lev	-301.019	444.0895	-3.83	0.000***
lnsal	65.6846	95.67819	1.73	0.003***
grw	-.1858669	6.566833	-0.03	0.977
ocf	86.9272	20.19812	14.21	0.000***
atan	75.9507	864.5072	0.43	0.064*
man	18.5804	5377.326	0.04	0.972
constant	-294.83	2121.545	-1.03	0.301
F(6,3171) = 42.84				
Prob > F = (0.0000)				
*** significant at 1%				
** significant at 5%				
* Significant at 10				

Source: STATA Output

This result can be interpreted as a company that uses more debt in its capital structure has higher financial risk due to increased bankruptcy possibilities. Such a company, therefore, will have difficulty to raise additional debt for it may be very costly, if not impossible, to borrow from the capital market. Hence, it improves its internal capacity to generate cash flows. Such firms try to free cash tied up in inventories and receivables. These tendencies shorten the cash conversion cycle. This result is in line with the argument that companies with higher debt levels need more cash flows from operations in order to repay debt or renew it (Nwaeze et al., (2006). But Jeng-Ren, et al., (2006) found significant negative association between debt ratio and working capital management as measured by net liquid balance. On the other hand, firm size has direct relationship with cash conversion cycle. This is evident from the significant p-value (at 1%) for this variable. It shows an increase in firm size of 1 unit is associated with increase in cash conversion cycle by 65 units, *ceteris paribus*. The cash conversion cycle is the result of inventory policy, receivables policy and accounts payable policy. Therefore, the link between firm size and cash conversion cycle emanates from the relationships that firm size has with inventory period, accounts receivable period as well as accounts payable period.

Larger firms may follow more relaxed inventory and receivables policies as they have easy, relatively, access to the capital markets. This tendency increases the cash conversion cycle. On the other hand, larger firms can use their size to negotiate longer credit periods from their suppliers. And this tends to decrease the cash conversion cycle. Hence, the ultimate effect depends on the extent of strength of those two opposing effects. In this specific case, cash conversion cycle increases with firm size as the effect of more liberal inventory and receivables policies outweighs the impact of payable period. In short, cash conversion cycle increases with increase in firm size due to the net effect of liberal credit period provided to customers over longer credit period negotiated with suppliers. This becomes evident when regression results on the components of the CCC are seen. However,

Moss and Stine (1993) showed that small firms have longer cash conversion period than large firms as a results of longer inventories period and longer accounts receivable period.

Similarly, operating cash flow is found to be positively associated with cash conversion cycle at 1% level of significance. That means other things held the same, 1 unit increase in operating cash flow increases the cash conversion cycle by 87 units, approximately. Similar result was found by Jeng-Ren, et al. (2006) although NLB was used to measure working capital management efficiency. However, this results contradicts with Moss and Stein (1993) who found negative significant association with CCC.

Further, asset tangibility also has a positive relationship with cash conversion cycle. It is interpreted as, holding others constant, a 1 unit increase in the tangibility of assets increases the cash conversion cycle by about 76 units. But its relationship is weak (only at 10% level of significance). Firms having higher tangible assets can use those assets as collateral to access finance from the capital markets. Hence, such firms may follow a more liberal credit and collection policy.

The remaining variables viz. firm growth and manufacturing don't have significant influence on cash conversion cycle. The insignificant value of firm growth shows growth opportunity of a firm doesn't influence wcm decisions. Similarly, the insignificant value for manufacturing means that there is no difference in the determinants of cash conversion cycle between manufacturing and merchandising companies. Therefore, the null hypothesis that there is significant association between the cash conversion cycle and determinants factors couldn't be rejected.

CONCLUSION:

Firms, among other things, can improve their performance by improving their working capital management. And, one way of enhancing working capital management efficiency is to understand the different factors that influence it. This study was conducted to investigate the determinants of working capital management in Ethiopian corporate sector context. Working capital decisions of Ethiopian corporate sector are influenced by firm size, operating cash flow, asset tangibility and leverage. Therefore, Ethiopian corporate sector should be concerned with those business characteristics in order to improve their working capital management efficiency. And it is also advised that those variable may be dynamic and should be studies time and again.

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