

Working Capital Management and Financial Performance of Manufacturing Sector in Sri Lanka

Rodrigo W.S.L.; Chandima S.H.I

Department of Finance & Accountancy, Vavuniya Campus of the
University of Jaffna

sajinirodrigo92@gmail.com; iroshanish@ymail.com

Abstract

Working Capital Management provides critical insight into the performance of the organizations and it plays an important role in any kind of industry, especially in the manufacturing sector. As an important indicator for measure the performance and viability of the organization, many managers involved considering the efficient management of Working Capital in the organization. Accordingly, the main purpose of this study is to identify the relationship between Working Capital Management and Financial Performance of the manufacturing sector in Sri Lanka. In Sri Lanka manufacturing sector is the second largest segment of the economy contributing significantly to the Gross Domestic Product of the country. For this study, data was collected from the manufacturing firms quoted on the Colombo Stock Exchange (CSE). As a sample size, this study used 30 manufacturing firms while the sample period of the study is five years from 2013 to 2017. The data was collected through the published annual reports of the respective companies. To examine the effect of WCM on performance, this study applied Return on Assets(ROA) and Return on Equity(ROE)as outcome variables whereas Cash Conversion Cycle (CCC), Current Financial Assets Ratio (CFAR) and Current Financial Debt Ratio (FDR) were used as explanatory variables. Since the study involves panel data, pooled OLS analysis has been carried out to arrive at the findings of the study. There is no significant relationship between CCC, CFAR, FDR, and outcome named ROA while CCC, CFAR, FDR, and ROE have a significant relationship, the findings reveal. The study also concludes that manufacturing firms in Sri Lanka need to concentrate on conservative Working Capital Management policy and improve their collection and payment policy.

Keywords: working capital management, colombo stock exchange, cash conversion cycle, current financial assets ratio, current financial debt ratio

Introduction

Working Capital Management is considered to be crucial as it affects the survival of an organization. This concept is vital, especially for manufacturing firms. In Sri Lanka, the Manufacturing sector is the second leading sector of the economy and it accounts for 25% of GDP in 2017 (Central Bank of Sri Lanka). As an essential sector in the overall economic growth, the manufacturing sector requires an in-depth analysis to evaluate

the performance of its activities. Working capital management efficiency is vital especially for manufacturing firms, where a major part of assets is composed of current assets (Horne and Wachowitz, 2000).

Nowadays top-level managers spend more time to solve the problem related to the working capital management. Company profitability and liquidity highly depend on the efficient management of working capital. Every organization needs to maintain adequate liquidity in day to day routines to ensure the smooth functioning of the firm. For that, companies need to give priority to investing in current assets rather than investing in fixed assets. In addition to that companies need to concern about the profitability also. Since firms' decisions about current assets are linked with the trade-off between risk and return. Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet a due short-term obligation on the one hand and avoid excessive investment in these assets on the other hand (Eljelly, 2004).

By referring to the above elaborations, it is obvious that efficient management of working capital is essential for any organization to keep their business viable for long. In the present study, the association between WCM and Financial Performance is examined. Therefore, this study collected data through the annual reports of each manufacturing organizations and analyzed the performance using the different methods like Cash Conversion Cycle (CCC), Net Trade Cycle (NTC), Receivable Turnover in Days (RTD), Number of Days in Inventory, Number of Days in Payable. Considering the input variables as above mentioned, this paper used Return on Asset (ROA) and Return on Equity (ROE) as outcome variables. The study consists of manufacturing firms that covered the five years from 2013 to 2017.

This study is directed towards analyzing the working capital management affection and application in the manufacturing sector by using different measurement tools. Further, this study is a focus to find out the impact of variables of working capital management on firm profitability and identify the nature and extent of the relationship between working capital management and performance.

Literature Review

The main concern of this study is to find out the relationship between working capital management and performance of the selected manufacturing organizations. There are different studies related to working capital management and its consequences for company profitability and liquidity.

Simon et al. (2017) found that working capital management is vital to provide liquidity and enhance the performance of the firm. Also, researchers examined the quadratic relationship between working capital management and firms' performance. The results of the study indicate that deviation from the optimal level of investment in working capital management affects the performance of firms'. Finally, researchers recommend that firms should promote best practices for maintaining optimal working capital investment level enhance firms' performance and sustain growth.

Tariq et al. (2013) analyzed the effect of the proper management of working capital on the financial performance of the cement sector in Pakistan. The dependent variable of the study is Return on Assets which is used as a proxy for financial performance. There are independent variables like accounts receivable in days, inventory turnover in days, (CCC) and payable turnover in days. In this study, researchers used panel data methodology to analyze the impact of Working Capital Management on the performance of the Cement sector.

Niresh (2012) emphasized that Working capital management is considered to be a crucial element in determining the financial performance of an organization. The primary purpose of this paper is to investigate the relationship between working capital management and financial performance of listed manufacturing firms in Sri Lanka. In this study, researcher measured performance in terms of return on assets and return on equity while cash conversion cycle, current assets to total assets and current liabilities to total assets were used as measures of working capital management. Further, Correlation and regression analysis were used in this study. In conclusion, this research paper revealed that there is no significant relationship between cash conversion cycle and performance measures and also manufacturing firms in Sri Lanka follow conservative working capital management policy.

Rahemen et al. (2010) found that working capital management plays a significant role in the better performance of manufacturing firms. Researchers analyzed the impact of working capital management on firms' performance in Pakistan. The results of the study indicate that the cash conversion cycle, net trade cycle and inventory turnover in days are significantly affecting the performance of the firms. This paper also found that manufacturing firms are in general facing problems with their collection and payment policies. Further, the author came to know that financial leverage, sales growth, and firm size have a significant effect on the firms' profitability. Finally, researchers suggested that specialized persons in the field of finance should be hired by the firms for expert advice on working capital management in the manufacturing sector so as to manage the working capital in the more robust way.

Gill et al. (2010) revealed that as working capital management plays a significant part in the better performance of manufacturing firms. The researchers attempt to analyze the relationship between Working Capital Management and profitability in a study titled "The impact of working capital management on the corporate performance of Listed Manufacturing Companies in Sri Lanka". In this study, the authors mainly concerned about the nature and extent of the relationship between working capital management and profitability. For that, researchers used the cash conversion cycle as a comprehensive measure of working capital management and net operating profitability as a measure of profitability. Multiple linear regression tools were used to find out the relationship between the independent and dependent variable in this research. The result of regression analysis found a significant positive relationship between Cash Conversion Cycle and Net Operating Profitability.

Shin and Soenen (1998) emphasized that efficient working capital management is very important for creating value for the shareholders. In this research paper, they found out that way of management of working capital had a significant impact on both profitability and liquidity. Further, the relationship between the length of the net trading cycle, corporate profitability and risk-adjusted stock return is analyzed using correlation and regression analysis. The finding of research indicates that there is a strong negative relationship between lengths of the firms' net trading cycle and profitability.

Methodology

Data Source and Sampling

The relationship between working capital management and performance of manufacturing firms were tested by using panel data methodology. The data used for this study was acquired from the comprehensive income statement and financial position of the sample manufacturing firms, listed on the Colombo Stock Exchange(CSE). This study used 30 manufacturing firms as a sample size out of 42 listed manufacturing companies in the CSE. Most recent five years information was included in the study as the basis for calculation. Accordingly, this research study extends to five years starting from 2013 to 2017. The reason for selecting this period was the latest data for investigating the nexus between working capital management and performance of the quoted manufacturing firms.

Variables

This research undertakes the quantitative approach to identify the link between working capital management and performance of the

manufacturing firms. Table 1 shows independent and dependent variables and measurement pertinent to the variables used in the study.

Table 1: Measurement of Variables

| Variables | Measurement |
|--|--|
| <p>Predictors</p> <ul style="list-style-type: none"> • Average Collection Period (ACP) • Average Payment Period (APP) • Inventory Turnover in Days(ITD) • Cash Conversion Cycle (CCC) • Current Financial Assets Ratio (CFAR) • Current Financial Debt Ratio (FDR) <p>Outcome Variables</p> <ul style="list-style-type: none"> • Return on Assets (ROA) • Return on Equity (ROE) | <ul style="list-style-type: none"> • Accounts Receivable/ Net Sales *365 • Accounts Payable/Cost of Goods Sold *365 • Inventory/Cost of Goods Sold * 365 • Average Collection Period +Inventory Turnover in Days- Average Payment Period • Current Assets/Total Assets • Current Liability/Total Assets • Net Income/Total Assets • Net Income/Shareholders Equity |

Research model

Multiple linear regression model is formed to discover the nexus between working capital management and performance of listed manufacturing firms.

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \epsilon$$

Where,

Y= Dependent variable

α = intercept

β = co-efficient

x_1 =CCC

x_2 =CFAR

x_3 =FDR

ϵ =Error term

Based on the variables used in the study the regression model can be depicted as follow.

$$ROA = \alpha + \beta_1 CCC + \beta_2 CFAR + \beta_3 FDR + \epsilon \quad \longrightarrow \text{Model 1}$$

$$ROE = \alpha + \beta_1 CCC + \beta_2 CFAR + \beta_3 FDR + \epsilon \quad \longrightarrow \text{Model 2}$$

Where,

ROA= Return on Assets
 ROE=Return on Equity
 CCC=Cash Conversion Cycle
 CFAR= Current Assets/Total Assets
 FDR= Current Liability/Total Assets

Results and Discussion

Multiple Regression Analysis

Predictors of Performance – Model Summary I

Table 2: Results of pooled OLS using ROA as the outcome variable

```
. regress ROA CCC CFAR FDR
```

| Source | SS | df | MS | Number of obs | = | 150 |
|----------|------------|-----|------------|---------------|---|--------|
| Model | 176.362381 | 3 | 58.7874603 | F(3, 146) | = | 1.14 |
| Residual | 7558.32553 | 146 | 51.7693529 | Prob > F | = | 0.3368 |
| | | | | R-squared | = | 0.0228 |
| | | | | Adj R-squared | = | 0.0027 |
| Total | 7734.68791 | 149 | 51.9106571 | Root MSE | = | 7.1951 |

By referring to the table 2, it is obvious that the R^2 value for the impact of working capital management on ROA is found to be 0.02. It implies that only 2% of the variations in ROA is explained by the variations in predictors named CCC, CFAR, FDR. Further, the F value is revealed to be statistically insignificant at $P > 0.1$. Hence it can be inferred that working capital management has no profound impact on the outcome variable name ROA. Further, the R^2 value indicates that only 2% of the variations in ROA is explained by the predictors. The rest of 98% of the variations is simply because of the factors that have not been the considered in the study. Hence other factors are probably found to be better prognosticators of ROA.

Table 3: Results of pooled OLS using ROA as the outcome variable

| ROA | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
|-------|-----------|-----------|-------|-------|----------------------|----------|
| CCC | .0029176 | .0033261 | 0.88 | 0.382 | -.0036559 | .009491 |
| CFAR | -2.324523 | 1.639134 | -1.42 | 0.158 | -5.564018 | .9149716 |
| FDR | 7.641873 | 4.276294 | 1.79 | 0.076 | -.8095631 | 16.09331 |
| _cons | -.5500389 | 1.261365 | -0.44 | 0.663 | -3.042931 | 1.942853 |

By referring to the table 3, the multiple regression equation can be derived as follows,

$$ROA = -0.55 + 7.64FDR - 2.33CFAR + 0.003CCC + \epsilon$$

It is apparent from the coefficient as tabulated in table 3 that only FDR exhibits a significant association with ROA at $P < 0.1$. All other predictors namely CCC, CFAR exhibit a statistically insignificant association with the outcome variable named ROA as it was evidenced from the P values.

Predictors of Performance – Model Summary II

Table 4: Results of pooled OLS using ROE as the outcome variable

```
regress ROE CCC CFAR FDR
```

| Source | SS | df | MS | Number of obs | = | 150 |
|----------|------------|-----|------------|---------------|---|--------|
| Model | 591.205417 | 3 | 197.068472 | F(3, 146) | = | 2.48 |
| Residual | 11621.9257 | 146 | 79.6022306 | Prob > F | = | 0.0638 |
| | | | | R-squared | = | 0.0484 |
| | | | | Adj R-squared | = | 0.0289 |
| Total | 12213.1311 | 149 | 81.9673227 | Root MSE | = | 8.922 |

As it can be seen from the table 4 that the R^2 value for the impact of working capital management on ROE is discovered to be 0.048. It means that only 4.8% of the variations in ROE is explained by the variations in predictors named CCC, CFAR, FDR. Moreover, R^2 value indicates that only 4.8% of the variations in ROE is defined by explanatory variables. The rest of 95.2% of variables in ROE is simply because of the factors that have not been the depicted in the model.

Furthermore, the F value is discovered to be statistically significant at $P < 0.1$. It is an indication that working capital management has a profound impact on the ROE.

Table 5: Results of pooled OLS using ROE as the outcome variable

| ROE | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
|-------|-----------|-----------|-------|-------|----------------------|-----------|
| CCC | -.0025795 | .0041244 | -0.63 | 0.533 | -.0107307 | .0055717 |
| CFAR | 3.918999 | 2.032547 | 1.93 | 0.056 | -.0980163 | 7.936015 |
| FDR | -14.42291 | 5.302661 | -2.72 | 0.007 | -24.9028 | -3.943017 |
| _cons | 2.491044 | 1.564108 | 1.59 | 0.113 | -.6001752 | 5.582263 |

According to the table 5, the regression of the following form,

$$\text{ROE} = 2.49 - 14.42\text{FDR} + 3.92\text{CFAR} - 0.0026\text{CCC} + \epsilon$$

It is apparent from the table 5, the P values indicate a statistically significant association between CFAR and ROE; and FDR and ROE at $P < 0.1$ and $P < 0.01$ respectively. Another predictor namely CCC shows a statistically insignificant association with ROE.

Testing for Multicollinearity

The Present study employed the Variance Inflation Factor (VIF) test in order to identify whether the problem of multicollinearity exists in the ideal models used in the study. The VIF indicates whether a predictor has a strong linear relationship with other predictors. Related to the VIF is the tolerance statistics, which is its reciprocal ($1/\text{VIF}$). There are no hard and fast rules about what value of the VIF should be the cause for concern, but generally, a VIF value of greater than 10 indicates a serious problem (Bowerman and O'Connell, 1990; Myers, 1990). Further, if the average VIF is substantially greater than one then the regression may be biased. As far as the value of tolerance is concerned, tolerance below 0.1 indicates a serious problem (Menard, 1995).

The study involved 2 models as model I and model II to assess the connectivity between WCM and financial performance using ROA and ROE.

Table 6 shows the tolerance values derived by employing the VIF test,

Table 6: Collinearity Statistics

| Variable | VIF | 1/VIF |
|----------|------|----------|
| FDR | 1.93 | 0.517171 |
| CFAR | 1.89 | 0.528303 |
| CCC | 1.09 | 0.917752 |
| Mean VIF | 1.64 | |

By referring to the table 6, it is apparent that there is no strong evidence of multicollinearity in the models 1 and 2 used for the study. The VIF values are less than 10 and the mean VIF is not substantially deviating from one. Therefore, it can be concluded that there is no multicollinearity problem exist among the predictors used in this study.

Conclusion and Recommendation

The main objective of this study is to analyze the relationship between working capital management and the performance of the manufacturing firms listed on the Colombo Stock Exchange. To this end, a sample of 30 manufacturing firms was used to conduct the study covering the period from 2013 to 2017.

Return on assets and Return on Equity were used as dependent variables. Independent variables were the Cash Conversion Cycle (CCC), Current Financial Assets Ratio (CFAR) and Current Financial Debt Ratio (CFDR). Panel Data analysis especially the pooled is used to study the relationship between Working Capital Management and manufacturing sector performance.

The findings of this study revealed that there is no significant relationship between CCC, CFAR, FDR with outcome variable of ROA while CCC, CFAR, FDR, and ROE have a significant relationship. The study also concludes that manufacturing firms in Sri Lanka need to concentrate on conservative Working Capital Management policy and improve their collection and payment policy. Considering the above findings this research paper is important for policymakers and regulators to make decisions and encourage managers and shareholders to pay more attention to effective working capital management in the organization.

Limitations

This study is limited to the sample of manufacturing firms in Sri Lanka for the period of five years from 2013 to 2017. Hence, the findings of this study could only be generalized to manufacturing firms which are included in this research. In addition to that this study was used Cash Conversion Cycle (CCC), Current Financial Assets Ratio (CFAR) and Current Financial Debt Ratio (CFDR) as independent variables to find out the impact on Return on Assets and Return on Equity. But this research did not take into consideration firm size, credit policy, sales growth, technological changes to study the influence on performance.

Future Research Directions

Future researchers should consider extending the sample size beyond the Sri Lankan manufacturing sector. In addition to that researchers can also focus on carrying out an analysis at different business cycle like a case study approach for selected companies. Further studies also can be considered about the different measures of firm performance such as Gross Operating Profit, Earning per Share and Dividend per Share rather than limiting the performance measures merely to accounting-based measures.

References

- Bowerman, BL, and O'Connell, RT 1990, Linear statistical models: An applied approach, 2nd Edition, Belmont, CA: Duxbury.
- Eljelly, A 2004, Liquidity – Profitability trade-off: An Empirical investigation in an Emerging market, International Journal of Commerce and Management, vol.14, No.2, pp 48 – 61.
- Gill, A, Berger, N and Mathur, N 2010, The Relationship Between Working Capital Management And Profitability: Evidence From The United States, Business and Economics Journal, vol 2010: BEJ-10.
- Horne, VJC and Wachowicz, JM 2000, Fundamentals of Financial Management, New Jersey: Prentice Hall Inc, 11th Ed.
- [Menard, S 1995, _Applied logistics regression analysis, Sage University Paper Series on Quantitative Applications in the Social Sciences', Thousand Oaks, CA: Sage.
- Myers, RH 1990, Classical and modern regression application, 2nd Edition, CA: Duxbury.
- Niresh, JA 2012, Working Capital Management & Financial Performance of Sri Lanka, European Journal of Business and Management, vol 4, No.15, pp 23-30.
- [Rahemen, A, Afza, T, Qayyum, A and Bodla, MA 2010, Working Capital Management and Corporate Performance of Manufacturing Sector

- in Pakistan, International Research Journal of Finance and Economics,47, pp 152-163.
-]Simon,S, Sawandi, N and Abdul-Hamid, MA 2017, The Quadratic Relationship between Working Capital Management and Firm Performance: Evidence from the Nigerian Economy, Journal of Business and Retail Management Research, vol. 12, pp 94-108.
- Shin, HH and Soenen, L 1998, Efficiency of working capital management and corporate profitability, Financial Practice and Education, vol. 8, pp 37-45.
- Tariq, H, Mumtaz, R and Rehan, MF 2013, Working Capital Management and Firm Performance: Evidence from Pakistan, European Journal of Business and Management, Vol.5, No.20,pp86-91.