"DETERMINANTS OF PROFITABILITY UNDERLINING THE WORKING CAPITAL MANAGEMENT AND COST STRUCTURE OF SRI LANKAN COMPANIES"

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ABSTRACT

Efficient working capital management is an integral part of the overall corporate strategy to create shareholder value. Researchers investigated the relation between the companies' working capital, cost structure and their profitability. This relationship is examined using correlation and regression analysis. In this research, researchers have selected a sample of 65 Sri Lankan companies listed on Colombo Stock Exchange for a period of 5 years from 2003-2007, researchers have studied the effect of different variables of working capital management and cost structure on the profitability of Sri Lankan Companies including the Debtors turn over in days, Inventory turnover in days, Creditors payable in days, and working capital cycle representing the working capital and Administrative, Selling and Finance expenses representing the cost structure .

The results suggest that managers can increase corporate profitability by reducing the number of inventory turn over days and increasing the creditors payable days in order to minimize the length of the working capital cycle. Increase in creditors payable days would give opportunities to the company for further investments. Also it suggests that the spending on selling and distribution would not increase the profitability and more finance cost would hinder the profits of the companies.

1.0 INTRODUCTION

1.1 Problem Statement

Generally most of the firms keep their attention almost with the short term financing sources and specially concern about their working capital management.
Therefore in this study we want to investigate the effects of working capital on profitability of Sri Lanka companies. Therefore the problem would be

"Does working capital management affect the profitability?
Other factor is the cost structure. Companies focus on cutting down their cost and to achieve the profitability with the bad economic conditions. Therefore it is important to identify
"How much the companies' cost structure affects to its profitability".
Here cost structure means the administrative cost, selling and distribution cost and finance cost of the companies.

1.2 Objectives of the study

This study has designed to identify the impact of working capital and cost structure on the company profitability in order to help Sri Lankan companies to manage its working capital and cost structure more efficiently while maximizing the profitability. The main objectives of this research are;

- To establish a relationship between the working capital and firm's profitability over a period of 5 years for 65 companies listed in Colombo stock Exchange (325 observations)
- To find out the effect of different components of working capital management on profitability.
- To develop a rational model for working capital and profitability
- To give some guidelines for companies when they determine the appropriate working capital level.
- To find out the relationship between profitability and the cost structure of those companies

- To identify the cost that can be cut down and that should not be cut down to maximize the profits
- To identify unnecessary costs that will beneath the profits

1.3 Significance of the study

During the time this research has been carried out the entire world has faced the economic downturn. Under a recession companies can not grow. What is most important is to survive. Finance controllers have a major role to manage its working capital and Cost structure in order to drive the company performances for the survival of the organization. This research will provide a direction whether companies can perform well if the working capital is efficient and Cost structure is managed well.

2.0 RESEARCH DESIGN AND METHODOLOGY

2.1 Conceptual Frame work

Generally working capital efficiency is measured by the following three elements.

1. Inventory turnover days
2. Debtors turn over days
3. Creditors payable days

Therefore, this research focused on the behaviour of these three elements in detail. Another factor is Working Capital Cycle that is considered in the efficient working capital management. This also has been taken into the account in the research problem.

Working capital normally deals with the operations of the firms. Therefore, researchers thought it is more appropriate to relate the working capital with gross profit and operating profit of the companies. Further, profit before tax is also considered in this research as a profitability measurement.

With regard to cost structure analysis researchers have quantified the each cost discussed earlier as a percentage of turnovers as follows.

1. Administration cost / Turnover
2. Selling and distribution cost/ Turn over
3. Finance cost/ Turnover

Here these ratios are related to profit before tax of the companies in order to test their impact on the profitability. Administrative, selling and distribution are related to the net operating profit also. This research is 100% based on the empirical data available from Colombo Stock Exchange for 5 years for 65 companies.

2.2 Hypothesis used in the study

Since the objective of this study is to examine the impact of the working capital management and cost structure on the profitability we can use the profitability as the dependent variable and the other two as independent variables. Considering the facts following hypothesis can be built up.

Null Hypotheses = H_0
Alternative Hypotheses = H_1

Hypothesis 1

The first hypothesis of this study is as follows:

$H_{0:}$ There is no relationship between efficient working capital management and profitability.

$H_{1:}$ There is a possible positive relationship between efficient working capital management and profitability. Firms more efficient in managing their working capital is expected to pose high level of profitability and vice versa. Here efficient Working capital management means length of the working capital cycle is low. (Less inventory turnover days, less debtors turnover days and more creditors payable days)

Considering the term efficient working capital management following hypothesis can be test in the research

Hypothesis 1.1

$H_{0:}$ No relationship between inventory turnover days and profitability

$H_{1:}$ There is a negative relationship between inventory turnover days and profitability

Hypothesis 1.2

$H_{0:}$ No relationship between debtors turnover days and profitability.

$H_{1:}$ There is a negative relationship between inventory turnover days and profitability

Hypothesis 1.3

$H_{0:}$ No relationship between creditors payable days and profitability

$H_{1:}$ There is a positive relationship between creditors payable days and profitability

Hypothesis 1.4

$H_{0:}$ No relationship with working capital cycle and profitability

$H_{1:}$ There is a negative relationship between working capital cycle and profitability

Hypothesis 2

The second hypothesis is relating to the cost structure it is given under each cost category.

Hypothesis 2.1

$H_{0:}$ There is no relationship between Admin expenses and Profitability

$H_{1:}$ There is a negative relationship between Admin expenses and Profitability

Hypothesis 2.2

$H_{0:}$ There is no relationship between Selling/Distribution expenses and Profitability

$H_{1:}$ There is a positive relationship between Selling/Distribution expenses and Profitability (Increase in Admin Expenses hinders the profitability)

Hypothesis 2.3

$H_{0:}$ There is no relationship between Finance cost and Profitability

$H_{1:}$ There is a negative relationship between Finance cost and Profitability (Increase in finance cost hinders the profitability)

2.3 Methodology

The purpose of this research is to contribute towards a very important aspect of financial management known as working capital management with reference to Sri Lanka. Here researchers will see the relationship between working capital management practices and its affects on profitability of 65 Sri Lankan firms listed on Colombo Stock Exchange for a period of five years from 2003 – 2007. This section of the article discusses the firms and variables included in the study, the distribution patterns of data and applied statistical techniques in investigating the relationship between working capital management and profitability.

2.3.1 Data Set and Sample

In this study, researchers considered all the Public quoted companies in Colombo Stock Exchange (CSE) at the year end 2008. Presently 237 companies are listed on the CSE, representing twenty (20) business sectors with a market capitalization of over 834 billion rupees (over US $ 7.5 billion), which correspond to approximately, 30% of the Gross Domestic Production of the country.

Sample consists of 65 listed companies of the above mentioned population (237) and considered the data for 5 years from 2003 to 2007 regarding the 65 listed companies. Finally researchers end up with 325 observations to build up the research model.

The reason for restricting to this period was that the latest data for investigation is available for this period. The sample is based on financial statements of the 65 Sri Lankan firms, listed in CSE including firms from different sectors of our economy. Because of the specific nature of their activities, firms in **BANK FINANCE AND INSURANCE, INFORMATION TECHNOLOGY** are excluded from the sample. Finally, the firms with data of the number of day's accounts receivable, number of days inventories, number of days accounts payable, Admin overheads, selling and distribution, Finance cost are included in the sample.

2.4 Method of Data analysis

2.4.1 Descriptive Analysis

Descriptive analysis is the first step of this analysis; it will help researchers to describe relevant aspects of phenomena of Working capital cycle and cost structure and provide detailed information about each relevant variable. Researches have already been conducted in our area of study and a lot of information is already on hand, and SPSS software has been used for analysis of the different variables in this study.

2.4.2 Quantitative Analysis

In quantitative analysis researchers applied two methods. First: we used correlation models, specifically Pearson correlation to measure the degree of association between different variables under consideration. Second: researchers used Regression analysis to estimate the causal relationships between profitability variable, Working Capital Cycle, each overhead and other chosen variables. By using this method researchers will be able to identify the significant of each explanatory variable to the model and also the significance of the overall model. This model was used as simple regression (one independent variable) and multiple regressions (more independent variables).

Researchers have used Pooled Ordinary Least Squares method for analysis. Researchers used panel data in a pooled regression, where time-series and cross-sectional observations were combined and estimated. In other words, several cross-sectional units were observed over a period of time in a panel data setting. For this purpose of analysis the MS Excel software was used to analyze financial data and SPSS software used to run the regression and ANOVA.

2.4.3 Model Specifications:

This study uses panel data regression analysis of cross-sectional and time series data. Researchers use the pooled regression type of panel data analysis.

The general form of our model is:

$$\textbf{(GP/NOP/PBT)}_{\textbf{Y t}} = \beta 0 + \sum_{\text{all}}^{n} \beta_1 X_{YT} + \varepsilon$$

$(GP/NOP/PBT)_{y\,t}$ = Profitability of the firm y at time t; y = 1, 2…65 firms

β0 = the intercept of equation

β_1 = Coefficients of X y t variables

X y t =the different independent variables for working capital management and cost structure of firm y at time t.

t = Time; 1, 2…..5

ε = the error term

Specifically, when researchers convert the above general least squares model into our specified Variables, it becomes:

$$\textbf{(GP/NOP/PBT)}_{\textbf{y t}} = \beta_0 + \beta_1 (ITD)_{y\,t} + \beta_2 (DTD)_{y\,t} + \beta_3 (CPD)_{y\,t} + \beta_4 (WCC)_{y\,t} + \beta_5 (ATO)_{y\,t} + \beta_6 (SDTO)_{y\,t} + \beta_7 (FCTO)_{y\,t} + \varepsilon$$

Where;

GP = Gross profit of the y firm at time t

NOP = Net operating profit

PBT = Profit before Tax

ITD = Inventory Turnover Days

DTD = Debtors Turnover Days

CPD = Creditors Payable Days

WCC = Working Capital Cycle

ATO = Admin overheads Turnover

SDTO = Selling and Distribution overhead Turnover

3. FINDINGS AND CONCLUSION

Most of the listed companies in Colombo Stock Exchange have invested large amounts of cash in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those Companies. Researchers have found a significant negative relationship between profitability and the inventory turnover in days, and Working Capital Cycle and a positive relation ship between profitability and account payable days for a sample of

65 listed companies listed in Colombo Stock Exchange. These results suggest that managers can create value for their shareholders by reducing the number of days of inventories turnover and creditors payable days and thus working capital cycle to a reasonable minimum.

Cost structure discussed in this report is amounting to 26% of the turnover of these companies. Admin cost is more significant. However, no relation ship was found regarding the admin expenses where selling and distribution and finance cost have a negative impact over the profitability. It suggests that the spending on marketing advertising and other selling and distribution expenses would not create more value to the share holders.

If we move into the hypotheses built up earlier, researchers conclude that the alternate hypothesis H_1 stated in the section 3.3 there is a possible positive relationship between efficient working capital management and profitability of Sri Lanka listed companies is the one to be accepted; and therefore reject the null hypothesis H_0. In the same way Hypothesis 1.1 is also accepted confirming there is a negative relationship with inventory turnover days and profitability. This leads us to reject the null hypothesis in 1.1 discussed earlier.

However, researchers had to accept the null hypothesis stated in hypothesis 1.2 since no evidences were found to build up such relation ship between debtors turnover days and profitability.

Regarding Hypothesis 1.3, researchers conclude there is a positive relationship between profitability of the companies considered and creditors payable days and hence accept the alternative hypothesis. Firms whose creditors payable days are very high shall have a small working capital cycle. Small working capital cycle means efficient working capital and it would lead to the companies' profitability favourably. Further money comes from sales of inventories and collection of debtors can be re invested during the extended credit periods in order to maximize the return of the companies and .eventually it determines the profitability.

Hypothesis 1.4 is on working capital cycle. Here researchers accept the alternative hypothesis H1 as there are enough evidences to prove that there is a negative impact on the profitability from working capital cycle.

The conclusions are in confirmation with most of the literature that researchers have referred which have found a strong negative relationship between the measures of working capital management including the average collection period, inventory turnover in days, and working capital cycle with corporate profitability. However researchers found a positive relationship between creditors payable days or account payable days and profitability which has not yet been found in the referred literature. They have found a negative relationship and justify as less profitable firms takes longer period to settle their bills.

In our opinion a negative relationship with creditors' payable days and profitability, and a positive relationship with working capital cycle and profitability are some contradictory scenarios. This can be further elaborated as follows.

- Less working capital cycle generates higher profits and lengthy working capital cycle generates lower profits.
- Less profitable firms takes longer period to settle their bills
- Lengthy Creditors payable days create shorter working capital cycle and thus higher profits.

However our study in Sri Lanka context has found that there is a positive relationship between creditors payable days and profitability which does not leave rooms for such contradiction.

Then considering the cost structure researchers would like to discuss the hypothesis built on cost structure. Here researchers reject the alternative hypothesis and accept the 2.1 null hypothesis. That means there is no relation ship between administrative cost and profitability.

Further both Finance cost and selling and distribution cost have negative impact over the profitability leading us to accept the alternative hypothesis (H_1) mentioned in the 2.2 and 2.3 of section 2.2 respectively.

Though a particular literature on the cost structure was not found it is obvious that there is a negative impact from the cost over the profitability. However researchers

wanted to test whether there is any significant impact from Admin cost, selling and distribution and finance cost over the profitability individually.

Most of the marketing personalities say spending on selling and distribution would intensify the turnover. However our study has found that though there is a turnover growth it does not create any value addition to the bottom line which is the firms' objective (to maximize the share holder wealth) since there is a negative impact from the selling and distribution over the profitability. Further commitments by financing the company capital structure with more debts or other short term commitments would hinder the profits as per the results given by our study on finance cost and profitability.

On the basis of the above analysis researchers conclude that these results can be further strengthened if the firms manage their working capital in more efficient ways. Management of working capital means "management of current assets and current liabilities, and financing these current assets". If these firms properly manage their cash, accounts receivables and inventories in a proper way, this will ultimately increase profitability of these companies.

There is much to be done about working capital of Sri Lankan companies in future. We suggest that further research to be conducted on the same topic with different companies and extending the years of the sample. The scope of further research may be extended to the working capital components management including cash, marketable securities, receivables and inventory management.

APPENDICES

Appendix 1: Data Presentation and Analysis

1 .Descriptive Analysis

Descriptive analysis shows the average, and standard deviation of the different variables of interest in the study. It also presents the minimum and maximum values of the variables which help in getting a picture about the maximum and minimum values a variable can achieve. Table 1 presents descriptive statistics for 65 Sri Lankan firms for a period of five years from 2003 to 2007 and for a total 325 firms' year observations.

Table 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Inventory Turnover Days	325	.00	1534.67	76.1750	114.2671
Debtors Turn over Days	325	.42	1054.90	76.9333	88.4977
Creditors payable days	325	.00	892.30	113.9495	122.2022
Working Capital Cycle	325	-879.40	1911.64	41.8490	219.3426
Gross profit Ratio	325	-.13	1.00	.3498	.2401
Net Operating Profit ratio	325	-.40	6.52	.1853	.4718
Profit Before Tax	325	-.78	4.63	.1991	.5593
Administration Cost	325	.01	1.45	.1803	.2104
Selling and Distribution	325	.00	.51	4.625E-02	5.557E-02
Finance Cost	325	-.03	.26	3.351E-02	3.282E-02
Valid N (listwise)	325				

Source: Calculations Based on Annual reports of firms from 2003-2007

The mean value of Gross Profit (GP) ratio is 35% and standard deviation is 24%. It means that the companies under consideration maintain a GP margin of 35% and it can deviate from 35% to both sides by 24 %. Maximum value for the GP ratio is 100% for a company in a year while the minimum is -13%.

In same way mean value for Net Operating Profit (NOP) and Profit Before Tax (PBT) are 18.53% and 19.91% with a deviation from the mean to both sides by 47.18% and 55.93% respectively.

The Working Capital Cycle (WCC) used as a proxy to check the efficiency in managing the Working Capital is on average 42 days and it deviates from this value to both sides by 219 days. Firms receive their receivables against their sales after an

average of 77 days with a standard deviation of 88 days indicating the 77 days would vary from -11 days to 165 days. It takes on average 76 days to sell the inventories with a standard deviation of 114 days. (76 days plus or minus 114 days). Firms wait on average 114 days to pay their trade creditors with a standard deviation of 122 days.

Variables relating to the cost structure portray the following descriptive. Admin overhead turnover ratio has a mean value of 18.03% with a standard deviation of 21%. Maximum Admin overheads recorded in the study is 145% and minimum is 1%.

Selling and distribution overheads turn over ratio is on average 5% with a standard deviation of 6%. Finance cost turnover ratio records a mean value of 3% with a deviation of 3% to both sides (Plus and minus).

2. Quantitative Analysis

2.1 Correlation (Appendix 2 and 3)

For quantitative analysis we used two methods. At first, correlation is used to measure the degree of association between different variables under consideration. We have been able to identify many important variables associated with working capital management and cost structure.

As multiple variables are influencing our problem Pearson's Correlation analysis is used for data to see the relationship between variables such as those between working capital management and profitability; cost structure and profitability. If efficient working capital management increases profitability, one should expect a negative relationship between the measures of working capital management and profitability variable. There is a negative relationship between gross profitability on the one hand and the measures of working capital management on the other hand. This is consistent with the view that the time lag between expenditure for purchases of raw material and the collection of sales of finished goods can be too long, and that decreasing this time lag increases profitability.

As far as the cost structure is concerned we have doubt on the fact that more selling and distribution expenses would increase the top line and thus the bottom line. Further, high admin cost would increase the productivity of the employees and it

would benefit the company bottom line. In spite of this high finance cost would hinder the bottom line showing a negative relation ship with profitability.
Appendix 2 presents Pearson correlation coefficients for all variables considered.

We started the analysis of correlation results between the inventory turnover days and net operating profit. The result of correlation analysis shows a negative coefficient -0.128 with a p-value of (0.021). It indicates that the result is significant at ά. = 5% or it is confident at 95% level. Simply if the inventory turnover days increase it will have a negative impact on the net operating profit.

Then we considered the relation ship between inventory turnover days and profit before tax. The result gives a negative coefficient -0.156 with a p-value of (.005) and significant at the ά. = 1% or confident at 99 % level. This scenario indicates that there is a negative relationship between inventory turnover days and profit before tax.

Correlation results between creditors payable days and gross profit shows an opposite result. Correlation coefficient of this result is a positive one as 0.529 with a p-value of (0.000). It implies that there is a positive relationship between these two variables and it is confident at 99% level or highly significant at ά. = 1%. If elaborate it further; if the firms take lengthy periods to settle their bills they can increase the gross profit margin.

Correlation of Working capital cycle which is a comprehensive measure of working capital management and gross profit ratio has a negative coefficient -0.301 with a p-value of (0.000). It says that there is a negative relation ship between WCC and Gross profit and it is highly significant at ά. = 1% or confident at 99% level. Further, if the working capital cycle increases it will have a negative impact on the gross profit and it will decrease.

By analyzing the results we can conclude that if the firm can reduce the inventory turnover days and extend the creditors payable days then the firm is efficient in managing its working capital by reducing the working capital cycle. This efficiency will lead to the firm's profitability.

To check the cost structure and its relation ship with the profitability, admin overhead turnover, Selling and Distribution overhead Turnover, Finance Cost Turn over ratios were used with the profit before tax and net operating profit.

There is a negative correlation coefficient of -0.149 between selling and distribution cost with a p-value of (0.007) indicating a highly significant result at ά. = 1% or it is confident at 99% level. In simple terms higher the selling and distribution profitability is low.

In the same way there is a negative coefficient of -0.210 between finance cost and profit before tax with a p-value of (0.000) indicating a highly significant result at ά. = 1% or at a confident level of 99%. This scenario implies that the companies whose financial expenses are high end up with lower profits.

We can conclude investing more in selling and distribution expenses in Sri Lanka would not add more value to the bottom line and incurring huge finance cost would hinder the profitability.

2.2 Regression Analysis (Appendix 4)

For the purpose of identifying the important variables influencing the dependent variable we have used the regression analysis. In panel data (pooled) regression, time –series and cross-sectional observations are combined and estimated. In other words, several cross-sectional units are observed over a period of time in a panel data setting. Panel data is more useful in studying the dynamics of adjustment, and is better able to identify and measure effects that are simply not detectable in pure cross-sections or pure time - series data.

We used regression analysis to investigate the impact of working capital management and cost structure on corporate profitability. The determinants of corporate profitability were estimated using pooled least squares method.

The determinants of Gross profit, net operating profit and profit before tax are investigated for all 325 firm-year observations. The results are shown in Appendix 4.

A number of different regression coefficients are estimated for selected independent variables.

This regression is estimated using the pooled least squares method and the model that we have applied is as follows.

$$\textbf{(GP/NOP/PBT)}_{y\,t} = \beta_0 + \beta_1 (ITD)_{y\,t} + \beta_2 (DTD)_{y\,t} + \beta_3 (CPD)_{y\,t} + \beta_4 (WCC)_{y\,t} + \beta_5 (ATO)_{y\,t} + \beta_6 (SDTO)_{y\,t} + \beta_7 (FCTO)_{y\,t} + \varepsilon$$

Simple regression

2.2.1 Gross profit (GP) and Creditors Payable Days (CPD)

$$\textbf{GP}_{y\,t} = \beta_0 + \beta_3 (CPD)_{y\,t} + \varepsilon$$

$$\textbf{GP}_{y\,t} = 0.231 + 0.001039\ CPD + \varepsilon$$

Results of the regression indicates that the coefficient of accounts payable is positive 0.001039 and is highly significant at ά. = 1% or confident at 99% level. This portrays that the increase in account payable days of y firm at time t would increase the gross profit of y firm at time t.

2.2.2 Gross profit (GP) and Working Capital Cycle (WCC)

$$\textbf{GP}_{y\,t} = \beta_0 + \beta_4 (WCC)_{y\,t} + \varepsilon$$

$$\textbf{GP}_{y\,t} = 0.364 - 0.000329\ (WCC)_{y\,t} + \varepsilon$$

Result of this regression shows that the coefficient of WCC is negative -0.000329 and highly significant at ά. = 1% or confident at 99% level. This scenario supports my hypothesis as decrease in the length of the working capital cycle (i.e. Efficient Working capital management) would increase the profitability.

2.2..3 Net Operating Profit (NOP) and Inventory Turnover Days (ITD)

$$\textbf{NOP y t} = \beta_0 + \beta_1 (ITD)_{y\,t} + \varepsilon$$

NOP y t = $0.226 - 0.000528 (ITD)_{y t} + \varepsilon$

Results of this regression indicates that the coefficient of ITD is negative and significant at ά. = 2% or confident at 98% level. It implies that there is a negative relationship with inventory turnover days and profitability as higher the inventory turnover days lower the profits vise versa.

3.2.4 Net Operating Profit (NOP) and WCC

NOP y t = $\beta_0 + \beta_4 (WCC)_{y t} + \varepsilon$

NOP y t = $0.195 - 0.000231(WCC)_{y t} + \varepsilon$

This regression line represents a negative coefficient of 0.000231 at a significant level of ά. = 5% or it is 95% confident that there is a negative relationship between profitability and the length of the working capital cycle. This also supports our hypothesis defined earlier.

2.2.5 Profit before Tax (PBT) and Inventory Turnover Days (ITD)

PBT $_{y t}$ = $\beta_0 + \beta_1 (ITD)_{y t} + \varepsilon$

PBT $_{y t}$ = $0.257 - 0.000764(ITD)_{y t} + \varepsilon$

Results of this regression is a negative coefficient of 0.000764 and it is significant at ά. = 5% or it is confident at 95% level. This portrays that there is an inverse relationship between inventory turnover days and profit before tax as higher the inventory turnover days profit before tax is low vise versa.

Multi Variable Regression

We checked the regression line of each dependent variable and all independent variables also.

2.2.6 Gross Profit and Independent variables except WCC

$GP_{y t} = \beta_0 + \beta_1 (ITD)_{y t} + \beta_2 (DTD)_{y t} + \beta_3 (CPD)_{y t} + \varepsilon$

$GP_{y t} = 0.23 - 0.000211(ITD)_{y t} + 0.000271(DTD)_{y t} + 0.001039(CPD)_{y t} + \varepsilon$

Here all the independent variables other than WCC are taken which will have an impact on efficient working capital management.

ANOVA table of this model portrays that the overall model is significant since the p-value is (0.000) and R^2 is 28% indicating the 28% of the gross profit is explained by the given independent variables (Inventory turnover days, Debtors turn over days and creditors payable days.

However, only the coefficient of Creditors Payable Days and constant are significant with a p-value of (0.000) and coefficient is positive 0.001039 indicating the same results in the simple regression of Creditors Payable Days and Gross profit. Further, since the overall model is significant we can conclude that the given independent variables have an impact on the profitability.

2.2.7 Profit Before Tax and Independent variables except WCC

$\mathbf{PBT}_{yt} = \beta_0 + \beta_1 (ITD)_{yt} + \beta_2 (DTD)_{yt} + \beta_3 (CPD)_{yt} + \varepsilon$

$\mathbf{PBT}_{yt} = 0.173 + 0.00121 (ITD)_{yt} + 0.001142 (DTD)_{yt} + 0.0002651$

We run the regression with PBT and all independent variables other than WCC. This model is also highly significant with a p- value of (0.001) according to the ANOVA table analysis. It implies that the given independent variables determine the profitability.

Individual coefficients of Inventory turnover days (-0.00121) and Debtors turn over days (0.001142) are significant with p- values of (0.000) and (0.005) respectively. It is 99% confident that there is a negative relation ship between Inventory turnover days and profit before tax as well as there is a positive relationship with Debtors turn over days and profit before tax.

Simple regression

Here the impact of administrative, Selling and distribution and finance expenses over the profitability is checked. Three types of expenses are independent variables where the profit before tax is the dependent variable.

2.2.8 PBT and Selling and Distribution overhead Turnover (SDTO)

$\mathbf{PBT}_{yt} = \beta_0 + \beta_6 (SDTO)_{yt} + \varepsilon$

$\mathbf{PBT}_{yt} = 0.27 - 1.499 (SDTO)_{yt} + \varepsilon$

Results indicate that there is a negative coefficient of 1.499 with a p-value of (0.007). It is significant at ά. = 1% or confident at 99% level, there is a negative relationship between PBT and selling and distribution expenses.

2.2.9 PBT and Finance Cost (FCTO)

$\mathbf{PBT\ y}\ t = \beta 0 + \beta 7\ (FCTO)\ y\ t + \varepsilon$

$\mathbf{PBT\ y\ t} = 0.319 - 3.572\ (FCTO)_{yt} + \varepsilon$

Results of this regression indicates that there is a negative coefficient of -3.572 and it is significant at ά. = 1% with a p-value of (0.000). Therefore it is confident that there is an inverse relationship between profit before tax and finance cost.

Multi variable regression

Regression model can be developed with all the independent variables relating to cost structure as follows.

2.2.10 PBT and Entire cost structure

$\mathbf{PBT}_{yt} = \beta_0 + \beta_5 (ATO)_{yt} + \beta_6 (SDTO)_{yt} + \beta_7 (FCTO)_{yt} + \varepsilon$

$\mathbf{PBT}_{yt} = 0.351 + 0.257(ATO)_{yt} - 1.508 (SDTO)_{yt} - 3.820(FCTO)_{yt} + \varepsilon$

ANOVA table of this regression model implies that the overall model is highly significant since the p-value is (0.000). Further the coefficients of individual independent variables are significant at ά. = 1% other than the admin overhead turnover ratio. This results also same as the simple regression since there is a negative impact on the profitability from both finance cost and selling and distribution expenses and it is 99% confident.

Appendix 2

Correlation Tables

Correlations

		Inventory Turnover Days	Debtors Turn over Days	Creditors payable days	Working Capital Cycle	Gross profit Ratio	Net Operating Profit ratio	Profit Before Tax
Inventory Turnover Days	Pearson Correlation	1.000	.535**	-.091	.785**	-.094	-.128*	-.156**
	Sig. (2-tailed)	.	.000	.102	.000	.091	.021	.005
	N	325	325	325	325	325	325	325
Debtors Turn over Days	Pearson Correlation	.535**	1.000	.039	.687**	.066	-.090	.051
	Sig. (2-tailed)	.000	.	.481	.000	.233	.104	.363
	N	325	325	325	325	325	325	325
Creditors payable days	Pearson Correlation	-.091	.039	1.000	-.548**	.529**	-.003	.087
	Sig. (2-tailed)	.102	.481	.	.000	.000	.963	.115
	N	325	325	325	325	325	325	325
Working Capital Cycle	Pearson Correlation	.785**	.687**	-.548**	1.000	-.301**	-.108	-.072
	Sig. (2-tailed)	.000	.000	.000	.	.000	.053	.192
	N	325	325	325	325	325	325	325
Gross profit Ratio	Pearson Correlation	-.094	.066	.529**	-.301**	1.000	.360**	.345**
	Sig. (2-tailed)	.091	.233	.000	.000	.	.000	.000
	N	325	325	325	325	325	325	325
Net Operating Profit ratio	Pearson Correlation	-.128*	-.090	-.003	-.108	.360**	1.000	.622**
	Sig. (2-tailed)	.021	.104	.963	.053	.000	.	.000
	N	325	325	325	325	325	325	325
Profit Before Tax	Pearson Correlation	-.156**	.051	.087	-.072	.345**	.622**	1.000
	Sig. (2-tailed)	.005	.363	.115	.192	.000	.000	.
	N	325	325	325	325	325	325	325

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

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

Appendix 3

Correlation Tables

Correlations

		Administration Cost	Selling and Distribution	Finance Cost	Profit Before Tax	Net Operating Profit ratio
Administration Cost	Pearson Correlation	1.000	.006	.150**	.062	.001
	Sig. (2-tailed)	.	.909	.007	.264	.983
	N	325	325	325	325	325
Selling and Distribution	Pearson Correlation	.006	1.000	-.001	-.149**	-.094
	Sig. (2-tailed)	.909	.	.987	.007	.091
	N	325	325	325	325	325
Finance Cost	Pearson Correlation	.150**	-.001	1.000	-.210**	-.084
	Sig. (2-tailed)	.007	.987	.	.000	.132
	N	325	325	325	325	325
Profit Before Tax	Pearson Correlation	.062	-.149**	-.210**	1.000	.622**
	Sig. (2-tailed)	.264	.007	.000	.	.000
	N	325	325	325	325	325
Net Operating Profit ratio	Pearson Correlation	.001	-.094	-.084	.622**	1.000
	Sig. (2-tailed)	.983	.091	.132	.000	.
	N	325	325	325	325	325

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

Appendix 4

Regressions

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.231	.015		14.942	.000
	Creditors payable days	1.039E-03	.000	.529	11.206	.000

a. Dependent Variable: Gross profit Ratio

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.364	.013		28.081	.000
	Working Capital Cycle	-3.29E-04	.000	-.301	-5.673	.000

a. Dependent Variable: Gross profit Ratio

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.226	.031		7.214	.000
	Inventory Turnover Days	-5.28E-04	.000	-.128	-2.317	.021

a. Dependent Variable: Net Operating Profit ratio

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.195	.027		7.349	.000
	Working Capital Cycle	-2.31E-04	.000	-.108	-1.944	.053

a. Dependent Variable: Net Operating Profit ratio

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.257	.037		6.972	.000
	Inventory Turnover Days	-7.64E-04	.000	-.156	-2.841	.005

a. Dependent Variable: Profit Before Tax

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.230	.019		12.386	.000
	Inventory Turnover Days	-2.11E-04	.000	-.101	-1.789	.075
	Debtors Turn over Days	2.710E-04	.000	.100	1.784	.075
	Creditors payable days	1.014E-03	.000	.516	10.861	.000

a. Dependent Variable: Gross profit Ratio

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.268	.040		6.710	.000
	Selling and Distribution	-1.499	.554	-.149	-2.708	.007

a. Dependent Variable: Profit Before Tax

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.173	.050		3.477	.001
	Inventory Turnover Days	-1.21E-03	.000	-.248	-3.817	.000
	Debtors Turn over Days	1.142E-03	.000	.181	2.796	.005
	Creditors payable days	2.651E-04	.000	.058	1.056	.292

a. Dependent Variable: Profit Before Tax

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.319	.043		7.336	.000
	Finance Cost	-3.572	.927	-.210	-3.853	.000

a. Dependent Variable: Profit Before Tax

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.351	.054		6.494	.000
	Administration Cost	.257	.144	.097	1.780	.076
	Selling and Distribution	-1.508	.540	-.150	-2.791	.006
	Finance Cost	-3.820	.925	-.224	-4.130	.000

a. Dependent Variable: Profit Before Tax

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