CHAPTER-V

DETERMINANTS OF WORKING CAPITAL
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5.1 INTRODUCTION

Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet short term obligations on the one hand and to avoid excessive investment in these assets on the other hand. As the working capital will ultimately affect the profitability of the firm the management of working capital should be given proper consideration. In this context, this chapter is devoted to examine the factor that influence the working capital of the selected cement companies in Tamil Nadu viz., India cements Ltd (MCL) and Madras cements Ltd (MCL) during the period 1993/94 – 2007/08. The factors that influence the working capital are selected on the basis of existing literature. The determinants of working capital are analysed by using regressions.

5.2. MEASUREMENT OF VARIABLES:

Keeping the gross and net concepts of working capital in mind, the following variables on the ‘a priori’ ground have been identified as determinants of working capital in the present study. The explanatory variables, here, are profit margin, total assets turnover ratio, liquid ratio,
inventory turnover ratio and debtors turnover ratio. The gross working capital turnover ratio and net working capital turnover ratio have been used as dependent variables alternatively. The measurement of these variables has been presented here briefly.

*PROBIT MARGIN (PM):*

The profit margin ratio has been calculated by dividing profit after tax by sales as shown below:

\[
\text{Profit Margin} = \frac{\text{PAT}}{\text{Sales}} \times 100
\]

This ratio is expressed in percentage. A high ratio is preferable so as to invest less amount in working capital. The higher the ratio is the lower the working capital requirement and vice versa.

* TOTAL ASSETS TURNOVER RATIO (TATR)

This ratio has been computed by dividing sales by total assets as under:

\[
\text{TATR} = \frac{\text{Sales}}{\text{Total assets}}
\]

If the proportion of sales to total assets is high the investment in working capital is also high. The higher the ratio, is the higher the working capital requirement and vice versa.
*LIQUID RATIO (LR)

This ratio has been calculated by dividing liquid assets by current liabilities as under:

\[
LR = \frac{\text{Liquid Assets}}{\text{Current liabilities}}
\]

If the proportion of liquid assets to current liabilities is greater, the investment in working capital is also greater. The higher the ratio, is the higher the working capital turnover and vice versa.

*INVENTORY TURNOVER RATIO (ITR):

The ratio has been calculated by dividing sales by inventory as under:

\[
ITR = \frac{\text{Sales}}{\text{Inventory}}
\]

The higher the ratio, the greater the efficiency of funds employed in Inventory and consequently less investment in Inventory is needed. The higher the ratio, is the higher the WCTR and vice versa.
* DEBTORS TURNOVER RATIO (DTR):

The ratio has been calculated by dividing sales by debtors as shown below:

\[
\text{Sales} \quad ITR = \frac{\text{Sales}}{\text{Debtors}}
\]

The higher the ratio, the greater the efficiency of funds employed in Debtors and consequently less investment in debtors is needed. The higher the ratio, is the higher the WCTR and vice versa.

5.3 EMPIRICAL ANALYSIS:

As a sequel to the analysis of the trends in working capital, an attempt is made further to analyse the determinants of working capital of India Cements Ltd (ICL) and Madras Cements Ltd (MCL) by using regression technique.

5.3.1 HYPOTHESIS:

To formulate hypothesis the following questions are sought to be answered in this chapter:

Does the working capital turnover decreases with profit margin?
How does liquidity affect working capital turnover?
How do turnover ratios such as total assets turnover, inventory turnover and debtors’ turnover influence working capital turnover?

Corresponding to these questions, the following hypotheses are formulated.

a) Working capital turnover is a decreasing function of profit margin.
b) Working capital turnover is an increasing function of liquidity.
c) Working capital increases with increase in total assets turnover, inventory turnover and debtors’ turnover.

5.3.2 WORKING CAPITAL FUNCTION:

The regression function for working capital in terms of gross working capital turnover ratio (GWCTR) and net working capital turnover ratio (NWCTR) are now estimated on the basis of the ordinary least square method as shown below:

\[ WC = f (PM, TATR, ITR, DTR, LR) \]

Where WC = Working Capital in terms of GWCTR and NWCTR

GWCTR = Gross working capital turnover ratio

NWCTR = Net working capital turnover ratio

PM = Profit margin

TATR = Total assets turnover ratio

ITR = Inventory turnover ratio

DTR = Debtors turnover ratio

LR = Liquid ratio
5.3.3 SPECIFICATION OF VARIABLES

a) The co-efficient of profit margin (PM) is expected to be negative. It implies that the increase in profit margin would decrease the working capital in terms of GWCTR and NWCTR. An inverse relationship exists between working capital and profit margin.

b) The coefficient of turnover ratio such as total assets turnover ratio (TATR), inventory turnover ratio (ITR) and debtors turnover ratio (DTR) are expected to be positive. It implies that the increase in turnover ratios would increase the working capital and vice versa.

c) The coefficient of liquid ratio is expected to be positive. It implies that the increase in liquid ratio would increase the working capital and vice versa. A direct relationship exits between working capital and liquid ratio.

5.4. RESULTS AND DISCUSSIONS

The regression results of the working capital in terms of GWCTR and NWCTR have been presented under two working capital models.
5.4.1. WORKING CAPITAL MODEL 1

The working capital Model -1 has been constructed by using five variables viz., PM, LR, TATR, ITR and DTR as under,

\[ WC = a + b_1 PM + b_2 LR + b_3 TATR + b_4 ITR + b_5 DTR - Model - 1 \]

The estimated regression results of the working capital Model -1 for the selected cement companies during the period 1993/94 – 2007/08 are presented in Table 5-1.

It is evident that the estimated working capital function is good under both measures of working capital in ICL and MCL since the explanatory power of the equation measured by \( R^2 \) and F appear to be good. The value of \( R^2 \) varies from 0.97 to 0.72. That is about 97 percent to 72 percent of the variations in GWCTR and NWCTR in the selected cement companies are explained by the variables in that equation. The regression as a whole is highly significant at 1 percent level in both the firms under study.

It is clear from Table 5-1 that the coefficient of PM is negative (as expected) under both the measures of working capital (GWCTR and NWCTR) in ICL and MCL but it is statistically insignificant in all. It implies that PM does not influence the working capital. Hence the hypothesis that working capital is a decreasing function of PM has not been proved under this study.
<table>
<thead>
<tr>
<th>Co.</th>
<th>Co-efficient of</th>
<th>R²</th>
<th>F Ratio</th>
<th>D.W</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant</td>
<td>PM</td>
<td>LR</td>
<td>TATR</td>
</tr>
<tr>
<td>ICL</td>
<td>-0.836 (-1.189)</td>
<td>-2.266 (-1.570)</td>
<td>-0.266 (-2.595)*</td>
<td>3.327 (7.736)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.97</td>
<td>65.580*</td>
<td>2.052</td>
</tr>
<tr>
<td>MCL</td>
<td>-0.176 (-0.409)</td>
<td>9.5931 (-0.502)</td>
<td>0.287 (1.542)</td>
<td>-3.150 (-0.947)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.97</td>
<td>74.597*</td>
<td>2.696</td>
</tr>
<tr>
<td>ICL</td>
<td>-0.836 (-1.189)</td>
<td>-2.266 (-1.570)</td>
<td>-0.266 (-2.595)*</td>
<td>3.327 (7.736)*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.97</td>
<td>65.580*</td>
<td>2.052</td>
</tr>
<tr>
<td>MCL</td>
<td>5.408 (2.2005)</td>
<td>-0.164 (-1.496)</td>
<td>-1.760 (-1.650)</td>
<td>-0.260 (-0.136)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.72</td>
<td>4.677*</td>
<td>2.857</td>
</tr>
</tbody>
</table>

Note: Figures in parenthesis are computed 't' value.

Significant level: * 1 percent  ** 5 percent  *** 10 percent.
Source: Centre for Monitoring Indian Economy (CMIE), Mumbai, India.
The liquid ratio, a measure of liquidity, has a significant negative (unexpected) relationship with GWCTR as well as with NWCTR in the case of ICL which does not confirm our hypothesis that profitability increases with LR. On the other hand, the coefficient of LR is positive (expected) with GWCTR and negative (unexpected) with NWCTR but insignificant in the case of MCL. It implies that the increase or decrease in LR will not affect the working capital.

The results of this regression further indicate that the co-efficient of three turnover ratios viz., TATR, ITR and DTR are positive and are highly significant at 1 percent level with GWCTR and NWCTR in the case of ICL. It implies that if these three turnover ratios increase, the WC will also increase in the case of ICL. On the other hand, in MCL, the co-efficient of TATR is negative but insignificant with GWCTR as well as with NWCTR. Further, the co-efficient of ITR is negative but insignificant with GWCTR, whereas it is positive but insignificant with NWCTR. It implies that TATR and ITR did not influence the working capital in MCL. Though the co-efficient of DTR is positive with GWCTR as well as with NWCTR in MCL, it is significant only with GWCTR. It means that if the DTR increases, the GWCTR will also increase in MCL.

To sum up, the turnover ratios (TATR, ITR and DTR) along with liquid ratio (LR) determined both gross working capital and net working capital in the case of ICL, whereas DTR alone influences the gross working capital in the case of MCL. The PM does not influence the working capital either of ICL or MCL.
5.4.2. WORKING CAPITAL MODEL 2

The working capital Model-2 has been framed by using four variables viz., LR, TATR, ITR and DTR as shown below:

\[ WC = a + b_1 \text{LR} + b_2 \text{TATR} + b_3 \text{ITR} + b_4 \text{DTR} - \text{Model-2} \]

The estimated regression results of the working capital Model-2 for the selected cement firms during the period 1993/94-2007/08 are presented in Table 5-2.

It is clear from Table 5.2 that the overall fit of the regression measured by R square and F appear to be good in both the selected companies. The value of R square varies from 0.97 to 0.65 under this model. About 97 percent to 65 percent of the variation in this model is explained by the variables (TATR, LR, ITR, and DTR) in that equation. The regression model as a whole is highly significant since the F value is statistically significant in ICL as well as in MCL.

It is evident that the co-efficient of TATR and DTR are positive with working capital (GWCTR and NWCTR) and are highly significant at 1 percent level in ICL. It means if the TATR and DTR increase, the working capital will also increase. This confirms our hypothesis that the relationship between working capital and TATR or DTR is direct. On the other hand, the coefficients of LR and DTR are positive with GWCTR and are highly significant at 1 percent level in MCL. It confirms the hypothesis that working capital is an increasing function of LR and DTR.
### TABLE 5.2
**WORKING CAPITAL FUNCTION**
(1993/94 to 2007/08)
Model: 2 - WC = a + b₁ LR + b₂ TATR + b₃ ITR + b₄ DTR

<table>
<thead>
<tr>
<th>Co.</th>
<th>Constant (b₁)</th>
<th>LR (b₂)</th>
<th>TATR (b₃)</th>
<th>ITR (b₄)</th>
<th>DTR (b₄)</th>
<th>R²</th>
<th>F Ratio</th>
<th>D.W</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICL</td>
<td>-0.403 (-0.582)</td>
<td>-0.206 (-2.022)**</td>
<td>3.279 (7.139)*</td>
<td>8.639 (1.648)</td>
<td>7.594 (4.317)*</td>
<td>0.97</td>
<td>70.962*</td>
<td>1.637</td>
</tr>
<tr>
<td>MCL</td>
<td>-0.351 (-1.501)</td>
<td>0.354 (2.865)*</td>
<td>-0.150 (-0.658)</td>
<td>2.011 (0.081)</td>
<td>4.194 (14.965)*</td>
<td>0.98</td>
<td>100.719*</td>
<td>2.743</td>
</tr>
<tr>
<td>ICL</td>
<td>-0.403 (-0.582)</td>
<td>-0.206 (-2.022)**</td>
<td>3.279 (7.139)*</td>
<td>8.639 (1.648)</td>
<td>7.594 (4.317)*</td>
<td>0.97</td>
<td>70.962*</td>
<td>1.637</td>
</tr>
<tr>
<td>MCL</td>
<td>8.423 (5.695)</td>
<td>-2.913 (-3.727)*</td>
<td>1.758 (1.224)</td>
<td>6.443 (0.411)</td>
<td>-1.765 (-0.997)</td>
<td>0.65</td>
<td>4.705*</td>
<td>3.189</td>
</tr>
</tbody>
</table>

Note: Figures in parenthesis are computed 't' value.
Significant level: * 1 percent  ** 5 percent  *** 10 percent.
Source: Centre for Monitoring Indian Economy (CMIE), Mumbai, India.
The LR has a significant negative relationship with working capital in ICL. It means if LR increases, the working capital decreases. This does not confirm our hypothesis that the liquid ratio and working capital has direct relationship. On the other hand, LR has a significant positive relation with GWCTR and a significant negative relationship with NWCTR in the case of MCL. Though the coefficient of ITR is positive with working capital it is insignificant in both the firms under this model. Hence the hypothesis that the WC is an increasing function of ITR is not proved.

To conclude, the turnover ratios such as TATR, DTR, and LR determine working capital in ICL, whereas the LR and DTR positively influenced the working capital (GWCTR) in MCL. On the contrary, the LR is negatively related to GWCTR and NWCTR in ICL and NWCTR in MCL.

6. CONCLUSION

From the above analysis in this first model, it is concluded that the profit margin does not influence the working capital of ICL and MCL. Besides, the turnover ratios such as TATR and DTR determine working capital in ICL, whereas the LR and DTR positively influence the working capital (GWCTR) in MCL. On the contrary, the LR is negatively related to GWCTR and NWCTR in ICL and NWCTR in MCL. In the second model, it is observed that the turnover ratios (TATR, ITR and DTR) along with liquid ratio (LR) determine both gross working capital and net working capital.
in ICL, whereas DTR alone influences the gross working capital in MCL.