Working Capital Management in Modern Rice Milling Firms at Kangayam, Tamil Nadu

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Abstract

This study was conducted to evaluate the working capital management practices adopted by the rice milling firms and to analyze its impact on profitability. Primary data on working capital management practices were collected by using an interview schedule, and the financial data were obtained from the records maintained by the firms. The study involved assessment of the working capital management practices adopted by the rice milling firms in terms of raw material ordering system and frequencies of overstocking of inventory. Working capital management efficiency indices, namely performance index, utilization index, and efficiency index were computed from the financial data, and it was found that the efficiency index was more than one during the study period, indicating an efficient working capital management by the firms. The average CCC of the firms during the study period was 3 months, and DPO had a significant and positive relationship with profitability of the firms.

Keywords: **working capital management practices, performance index, utilization index, efficiency index, cash conversion cycle**

JEL Classification: G30, M10, M21

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The food processing industry is of enormous significance for India's development because of the vital linkages and synergies it promotes between the two pillars of our economy - industry and agriculture. Among the food processing industries in the country, the cereal processing firms form a major share of revenue, accounting for 34% during 2010 (Rais, Acharya, & Sharma, 2013). India is self-sufficient in grain production and is the second largest rice producer after China, with a 21% global share. Rice is one of the most important food crops in terms of both area and consumer preference, and rice milling is the oldest and the largest agro processing industry of the country (Singha, 2013). Considering the importance of the rice milling industry in providing staple food for a vast population of the country, employment generation, and its contribution to the economy, various policies and programmes were implemented over the years by the Central Government (MoFPI) towards the development of this industry.

A huge demand from the market, fiscal and monetary support from the government, availability of formal credit, and infrastructure support led to a rise in the number of paddy processing firms with huge investments in

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technology and research. Increased growth in paddy processing firms opened up opportunities for conducting research in various facets of management. Scientifically rigorous exploratory research was deemed imperative for efficient management of agribusiness (Conforte, 2011).

Literature Review

Ranganatham (2011) reported that the inventory management practices in small scale enterprises were satisfactory in the Anantapur District in Andhra Pradesh. Butt, Hunjra, and Rehman (2010) revealed that the capital structure, divided policy, investment appraisal techniques, working capital, and financial performance assessment - all had a significant positive impact on the organizational performance in the Pakistani corporate sector. According to Maes, Sels, and Roodhooft (2005), the internal factors or management practices as such had the potential of affecting the financial performance of small businesses to a larger extent when compared to owner-manager and company characteristics. Khatik and Jain (2009) examined the working capital position of MPSEB (Madhya Pradesh State Electricity Board) under four categories - analysis of liquidity ratio, analysis of liquidity position, component wise analysis of working capital, and analysis of liquidity ranking.

Several studies in the past have examined the relationship between liquidity and profitability. A negative relationship between the cash conversion cycle and profitability was reported by Padachi (2006) and Majeed, Makki, Saleem, and Aziz (2013). A positive relationship between working capital and profitability in IT organizations in India was reported by Chandra, Chouhan, and Goswami (2012) ; Panigrahi (2013) observed a positive relationship between the cash conversion cycle and profitability of the firms.

Not much research work is available in literature that has evaluated the application of financial management practices in the Indian agribusiness sector. Analyzing the gap in the review of past studies, the present study is designed to assess the working capital management practices adopted by the rice milling firms in India, with specific reference to the rice milling firms in Kangayam Taluk in Tamil Nadu.

Objectives of the Study

The specific objectives of the study are :

(1) To analyze the working capital management practices adopted by the sample rice milling firms,

(2) To assess the efficiency of working capital management, and

(3) To estimate the cash conversion cycle of the rice milling firms and its impact on profitability of the firms.

The hypothesis framed for the study is:

➔ **H1 :** There is a negative relationship between the cash conversion cycle (CCC) and profitability of a firm.

Methodology

Though the Kangayam belt in Tamil Nady by itself was not a major producer of paddy, it evolved as an important paddy processing zone primarily because of the climatic conditions that were conducive for quick open yard drying both before storage and during processing. Another major factor for its good performance is the easy access to the markets. The quality of rice produced here is suited to the preferences of consumers in Coimbatore, Erode, Tirupur, Salem, and Karur districts of Tamil Nadu. Paddy procured from Thanjavur and Cauvery delta regions in Tamil Nadu and from other states like Karnataka, Andhra Pradesh, and Madhya Pradesh is brought here for processing. There are 140 modern rice milling firms in Kangayam Taluk of Tirupur District in Tamil Nadu, and the list was obtained from the Kangayam Taluka Arisi Aalai Urimaiyalargal Sangam (Kangayam Taluk Rice Mill

Owners' Association). Among these firms, 40 firms were selected using simple random sampling method. Data were collected by conducting personal interviews with the owners / managers of the firms using a pre-tested interview schedule. Data pertaining to the financial performance were obtained from the records maintained by the firms for 5 financial years, that is, from 2008-09 to 2012-13.

↳ **Working Capital Management Efficiency :** The index developed by Bhattacharya (1997, 2012) was used . The working capital management indices, namely the performance index, utilization index, and efficiency index were estimated using the following formulae:

1. Performance Index (PI_{WCM})

$$PI_{WCM} = \frac{Is \sum_{i=1}^{n} \frac{W_i(t\text{-}1)}{Wit}}{N} \qquad (1)$$

where,
I_S = sales index defined as S_t / S_{t-1},
W_i = individual group of current assets,
N = number of current assets groups,
and $i = 1,2,3,..N$.

2. Utilization Index (UI_{WCM})

$$UI_{WCM} = A_{t-1} / A_t \qquad (2)$$

where,
A_t = (current assets / total income)

3. Efficiency Index (EI_{WCM})

$$EI_{WCM} = PI_{WCM} \text{ X } UI_{WCM} \qquad (3)$$

The cash conversion cycle (CCC), a comprehensive measure of working capital, was estimated by using the data collected from the records maintained by the firms pertaining to the sales, cost of sales, accounts receivable, accounts payable, and average inventory position for five accounting years from 2008-09 to 2012-13. The multiple regression model was specified and estimated to establish the relationship between liquidity (components of the cash conversion cycle) and profitability (return on assets). Size of the company (natural logarithm of sales) was included as it was anticipated to have an impact on profitability. Size was also found to play a vital role in determining the efficiency of the working capital management of the IT firms examined by Chandra et al. (2012). The multiple regression model specified for the study is as follows :

$$ROA = \beta_0 + \beta_1 DSO + \beta_2 DIO + \beta_3 DPO + \beta_4 \text{Ln } Sales + \varepsilon \qquad (4)$$

The variables used for the multiple regression analysis are as follows :

Variables	Abbreviation	Formulae
Days Sales Outstanding	DSO	(Average Receivables/Sales) x 365
Days Inventory Outstanding	DIO	(Average Inventory/Cost of Sales) x 365
Days Payables Outstanding	DPO	(Average Payables/ Cost of Sales) x 365
Cash Conversion Cycle (days)	CCC	DSO + DIO - DPO
Size of the company	Ln Sales	Natural logarithm of sales
Return on assets	ROA	Net Income/ Total assets

Results and Discussion

Working Capital Management Practices : Working capital is regarded as the lifeblood of any business unit. Its effective management in the context of a high turnover low profit business like rice milling units is considered inevitable, since profit can be enhanced only through effective management of the components of working capital management - namely, inventory, payables, receivables, and cash.

Inventory Management Practices : It is a common practice in the rice milling industry to store the raw materials (namely paddy) for longer duration before taking up the processing activity. This is done essentially because ageing of the paddy enhances the cooking quality of rice. Huge level of inventory obviously demands more attention in terms of inventory management.

Ordering System : Paddy, the raw material for rice milling firms, is harvested only during a specific season, while the processing of paddy is done throughout the year. About 87% of the sample firms followed the fixed period order system based upon the capacity of the firm and the estimated demand for rice. Among the sample, about 12% of the firms placed their order only based on the need for each period as they were storing in private godowns.

Frequency of Overstocking of Paddy and Rice : Overstocking of the inventories will have both - a direct and an indirect impact on the profitability of the firms. The results of the occurrence of overstocking of paddy and rice are presented in the Table 1.

Table 1. Overstocking of Paddy and Rice

1. Occurrence of Paddy overstocking	No. of Firms	% to total
Frequently	13	32.50
Occasionally	19	47.50
Rarely	8	20.00
Total	40	100.00
2. Occurrence of Rice overstocking	**No. of Firms**	**% to total**
Frequently	3	7.50
Occasionally	30	75.00
Rarely	7	17.50
Total	40	100.00

Table 2. Working Capital Management Indices of the Sample Rice Milling Firms

(*N* =200 firm year observations)

Year	Performance Index	Utilization index	Efficiency Index
2008-09	1.126	0.916	1.031
2009-10	1.208	0.928	1.121
2010-11	1.190	0.937	1.116
2011-12	1.192	0.938	1.118
2012-13	2.288	1.023	2.340

Source: Data collected and compiled from audited financial statements

Overstocking of paddy in good quality will not be a problem for the rice milling firms. In fact, ageing of paddy normally enhances the cooking quality of rice and enables the firms to get a better price in the market. In terms of occurrence of paddy overstocking, the majority of the firms were in the occasional (47.50%) and frequent categories (32.50%). Frequent occurrence of rice overstocking was reported by 75% of the firms, as they adopted a practice of planning the processing activity in accordance with the market demand. This practice was followed because it was easy for the firms to store the produce in the form of paddy rather than rice, as the respondents indicated that the incidences of pest attack are more pronounced in rice than in paddy.

↳ **Working Capital Efficiency :** The performance index represents the average performance index of various components of current assets. For the present study, current assets were grouped into four categories namely inventories, receivables, cash and bank balance, and advances and deposits. The utilization index specifies the ability of the company in utilizing its current assets as a whole for the purpose of generating sales. The overall efficiency in working capital management namely, the efficiency index was computed as a product of performance index and utilization index. Working capital management indices of the rice milling firms for the financial years from 2008-09 till 2012-13 are presented in the Table 2.

The performance index represents the firm's ability in managing the different components of current assets with respect to their performance, and a value of more than one indicates efficient management of working capital. It could be implied from the results that the performance index during the entire study period was more than one and hence, the sample firms were efficient in managing the working capital.

The utilization index of working capital management characterizes the efficiency of the firms in utilizing the current assets as a whole to generate the desired level of sales. UIWCM of more than one indicates that the proportionate increase in income was greater than the proportionate increase in current assets. In the study period, it was less than one during the 4 years (namely from 2008-09 till 2011-12), though the values were close to one. It is noteworthy that there was a regular improvement in the index over the years, and the same had crossed the target level (one) during 2012-13. The efficiency index was estimated as the product of performance index and utilization index and measures the ultimate efficiency in working capital management. During the study period, it ranged from 1.031 to 2.340. Overall, it could be inferred that the firms were efficient in utilization of working capital for generation of sales. The sample respondents stated that this was reflected in the good performance

Figure 1. Cash Conversion Cycle

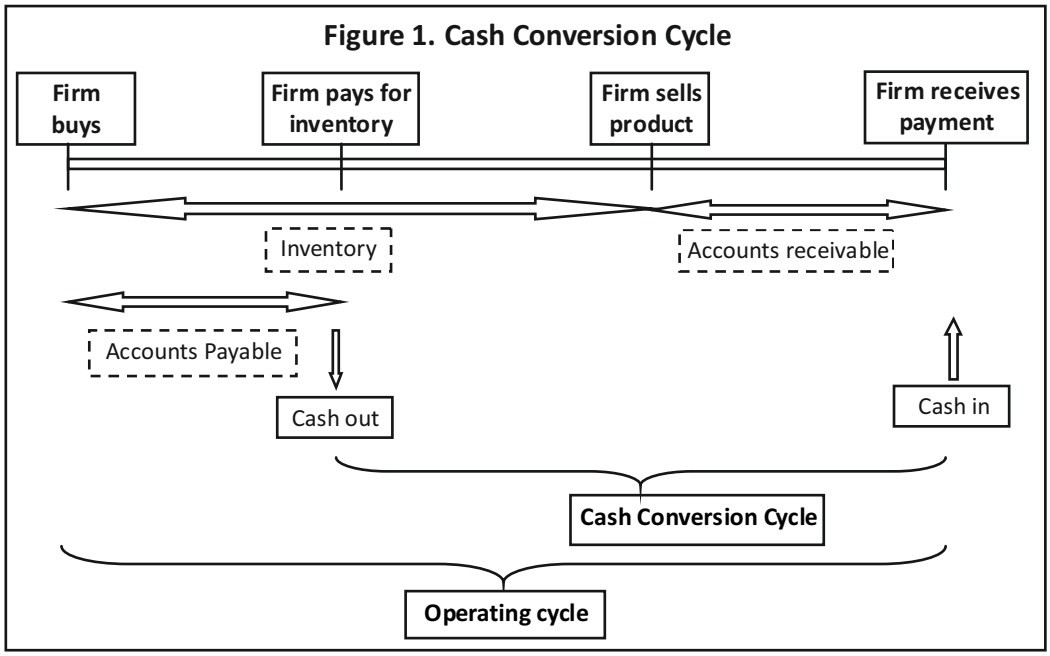

Table 3. Cash Conversion Cycle

(*N* = 200 firm year observations)

Year/ Parameter	DSO (in days)	DIO (in days)	DPO (in days)	CCC (in days)
2008-09	41	97	45	93
2009-10	40	95	45	90
2010-11	36	87	37	86
2011-12	33	93	32	94
2012-13	28	83	31	80
Per cent decrease in 2012-13 over the base year (2008-09)	46.42	16.87	45.16	16.25

Source: Data collected and compiled from audited financial statements

Table 4. Cash Conversion Cycle - Profitability Relationship

Dependent variable: Return on Assets (*N* = 200 firm year observations)

	Co-efficient	*P* - Value	Standard Error
Intercept	-0.38256	0.095612	0.220885
DSO	-0.00044	0.07188	0.000316
DIO	-0.00032	0.080329	0.000235
DPO	0.000857**	0.000756	0.000223
LN Sales	0.02352*	0.03292	0.011576
R^2	55.80		
Adjusted R^2	53.50		

*Significant at the 0.05 level

**Significant at the 0.01 level

ratings of the firms by the banks and facilitated them in enhancing the cash credit limits.

The Cash Conversion Cycle : The relationship between different components of working capital (Jordan, 2003) is presented in the Figure 1.The details of days sales outstanding *(DSO)*, days inventory outstanding *(DIO)*, days payables outstanding *(DPO),* and cash conversion cycle *(CCC)* are presented in the Table 3.

DSO is referred to the number of days taken for a company to collect the cash from its credit sales. This indicates the liquidity and efficiency of a firm in collecting the receivables. It could be observed that the *DSO* of the sample firms decreased by 46.42% from the base year (2008-09) till 2012-13. It was expressed by the respondents that as the volume of production increased over the years, the firms had started promoting cash sales by offering discounts to the tune of the interest amount expected to be paid for the credit sales.

DIO refers to the company's ability to turn its inventory into revenue. As indicated earlier, the rice milling firms stored paddy for a longer duration in order to improve the cooking quality of rice, and the *DIO*, on an average, was about three months.

DPO measures the company's ability to delay payment to creditors for goods and services received. Owing to the competition in the raw material market, and to benefit from the discount that was available for immediate cash payment, the firms reduced the *DPO* by 45.16%, that is, from 6 weeks to 4 weeks during the study period.

As *CCC* is a dependent measure, the variations in other three measures namely, *DSO*, *DIO*, and *DPO* will have an impact on the cash conversion cycle of a firm. The reduction in *DPO* was more than offset by the decrease in *DSO*, and hence, the decrease in *DIO* was alone observed in the *CCC* as well.

Cash Conversion Cycle - Profitability Relationship : Multiple regression analysis was used to establish the relationship between cash conversion cycle and profitability, and the results are presented in the Table 4. In general, the direction of the relationship of the individual components of the cash conversion cycle is consistent with the general rule of lesser the CCC, the greater would be the profitability. Earlier studies on different small and medium enterprises have also indicated a negative relationship between the cash conversion cycle and profitability (Padachi, 2006 ; Majeed et al., 2013).

The independent variables (*DSO, DIO, DPO*, and size of the firm) explain 55.80% (*R*-squared value) of the variations in *ROA*. It can be inferred that *DSO* has a negative relationship with the profitability measure, namely *ROA*. This finding is consistent with the results reported by Vijayakumar (2011) and Karaduman, Akbas, Caliskan, and Durer (2011). Lengthening the deadlines for payments to clients would reduce profit.

The coefficient of *DIO* is negative and insignificant. The negative relationship is consistent with the results obtained by Padachi (2006). The coefficient of *DPO* is positive and highly significant. Azam and Haider (2011) also reported similar results. The longer is the trade credit enjoyed by the firms, the higher will be the profit earned by the firms. Therefore, the results of the analysis support the hypothesis H1.

Conclusion

Majority of the firms followed the fixed period order system based upon the capacity of the firm and the estimated demand for rice. Occasional and frequent levels of paddy overstocking and occasional and rare levels of rice overstocking were reported by the sample firms. The working capital efficiency index was more than one during the study period, indicating an efficient management of working capital in generating sales. Average cash conversion cycle of the sample firms during the study period was 3 months. *DSO* and *DIO* were negatively related to *ROA*, while *DPO* was positively and significantly related to *ROA*. Overall, the working capital management in rice milling firms was good and this also improved over the years. This facilitated the firms in getting enhancement in cash credit limits.

Limitations of the Study and Scope for Further Research

SMEs contribute substantially to the economy in developing countries like India. Studies focusing on the financial management of SMEs are very minimal owing to the unavailability of published data. The present study was conducted using primary data collected from 40 rice milling firms located in Kangayam Taluk of Tirupur District in Tamil Nadu. Audited financial statements pertaining to 5 years from 2008-09 till 2012-13 were used to measure the working capital efficiency, cash conversion cycle, and profitability of the firms.

To examine the working capital management practices adopted by the firms, data were collected through personal interviews with owner/ managers of the sample firms. As the study focused on the rice milling firms, careful attention is needed as the results cannot be generalized for other firms. The present study can be extended in the future by using similar methodology and a greater sample size and time frame for conducting studies for other agro-processing firms.

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