Receivable Management in Refinery Industry in India: an Empirical Analysis

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ABSTRACT

Financial performances of any organization are dependent on profitability, working capital and financial structure. Sound working capital management helps the organization to improve its profitability. In the working capital management one important component is receivables. The receivables management is based on the policy formulated by the top management. In the present paper an attempt has been made to study the receivables management of Indian refinery industries with a data of 10 years. For the purpose of research, researcher has selected 05 units as sample. For the purpose of analysis, researchers has used ratio techniques and to test hypothesis ANOVA technique has been used. The result of the study indicates that the level of investment in receivable as a percentage of sales across the industry was reasonably less.

Key Words: Receivables Management, Refinery industry

The term receivable is defined as an debt owed to the firm by customers arising from sale of goods or services in the ordinary course of business. When a firm makes an ordinary sale of goods and services, the firm grants trade credit and creates accounts receivable which could be collected in the future . Receivable management is also called trade credit management. Thus accounts receivable represent an extension of credit to customers allowing them a reasonable period of time in which to pay for the goods and services received.

The sales of goods on credit are an essential part of the modern competitive economic systems. In fact credit sales and therefore, receivables are treated as a marketing tool to aid the sale of goods. The credit sales are generally made on open account in the sense that there are no formal acknowledgements of debt obligations through a financial instrument as a marketing tool. They are intended to promote sales and thereby profits. However, extension of credit involves risk and cost. Management should weigh the benefits as well as cost to determine the goal of receivables management. The objectives of receivables management is to promote sales and profit, make the units reach that point where the return on investment in further funding receivables is less than the cost of funds raised to finance that additional credit. The specific costs and benefits which are relevant to the objectives of receivables management are examined below:

The major costs associated with the extension of credit and account receivable is as follows:

(1) Collection cost (2) capital cost (3) delinquency cost and (4) default cost.

Apart from the cost, another factor that has a bearing on accounts receivable management is benefit emanating from credit sales. The benefits are the increased sales and anticipated profits because of a more liberal policy. When firms extend trade credit that is invest in receivables they intend to increase the sales. The impact of a liberal trade credit policy is likely to take two forms. ***First,*** it is oriented to sales expansion. In other words a firm may grant trade credit either to increase sales to exiting customers or attract new customers. This motive for investment in receivables is growth oriented. ***Secondly***, the firm may extend credit to protect its current sales against emerging competition. Here, the motive is sales retention. As a result of increased sales, the profits of the firm will increase. Among many factors that influence the size of receivable, sales volume, terms of trade, credit period and cash discount assume importance

Review of the literature:

Most of the studies on receivable management in Indian context highlight inefficiency: Khandelwal (1985) investigated the working capital management process and practices among 40 small scale industries in the state of Rajasthan, between 1975-76 and 1979-80. The study revealed that the management of receivables was highly ineffective and disorderly. It was found that bills receivable constituted as much as 50% of total current assets. Highlighting the sickness in the Jodhpur industrial estate,

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the study attributed the main reason to the inefficient management of working capital. The study also revealed that entrepreneurs had to be educated on the concept of working capital management. In the year 1988 one book published on "working capital structure of private enterprises" by J.Panda and A.K. Satapathy covers a study of 10 private sector companies engaged in production of cement. The study covers various aspects of working capital from 1965 to 1985. He had analyzed working capital position of selected units as a whole and as well as individual analysis. Finally he had made suggestions for the better utilization of various components of working capital.

Few studies conducted in India are summarized here: Bhayani (2004) has conducted study on working capital and profitability of cement industry and found that profitability is highly influenced by working capital. Linkage between asset management and profitability of Indian Industry has been conducted by Narware P.C. (2004), Debasis and Debdas (2005) and finds that long-term asset management made positive as well as very significant contribution towards improvement of corporate profitability. Chakraborty P.K. (2005), Malik A.K. and Sur D . (1998 & 1999) has conducted to study the effect of working capital management on profitability with case study. Conducting a survey among 94 Japanese companies in USA, Suk et al.(1992) found that they differ in working capital management practices from in the US and 39 terms of lower level of inventory and higher levels of account receivable. The study revealed that while the US firms piled-up their inventories, Japanese firm had higher percentage of receivable to total assets.

In their survey among 57 small firms in Canada, 105 largest firms in the US and 39 largest firms in Australia, Khoury et al,(1999) attempted to compare the working capital practice among three nations. The major aspects of the study were, working capital policy, cash and equivalents, account recoverable, inventory, accounts and note payable and managing working capital itself. The study revealed that 7 % of the Canadian firms had formal working capital policies and 28.5 % had a cautions working capital policy. Further Canadian firm were learning more on the effect on sales whereas the Australian and the US companies were found to focus more on the impact on the firm's profit while evaluating the credit worthiness of the customers.

While many studies have noted that receivable management was a neglected area, Oppedahl and Richard (1990) examined the causes for such neglect. They found that managements were pre-occupied with capital budgeting projects, which affected the quality of working capital decision. The essay revealed that receivable constituted the most important element of working capital and hence, recommended that the managers need to be very cautious in the management of the same, in order to minimize default risk. It is thus possible to note that management of receivable is found inefficient not only in the Indian context but also in other parts of the world. Considering the fact that the refinery industry is poised for unprecedented growth, it is pertinent to examine the trends in various measures of receivable management in the light of various developments taking place in the economy.

Methodology of the Study

Source of the data:

"Receivable Management in Refinery Industry in India: An Empirical Analysis" has been made by using data from financial statements of All the five major players in Refinery industry, they are - Reliance Industries Ltd (RIL), Hindustan Petroleum Corporation Ltd (HPCL) Indian Oil Corporation Ltd (IOCL), Chennai Petroleum Corporation Ltd (CPCL), and Bongaigaon Refinery & Petrochemicals Ltd (BRPL). The period of the study was ten years from 1997 to 2006. The data was collected from Capitaline database and from the annual reports of the respective companies.

Hypothesis for the Study

1. The size of receivables in current assets is uniform in sample units.
2. The size of receivables in total assets is uniform in sample units.
3. Receivables turnover is uniform in sample units.

Techniques of Analysis:

For the purpose of analysis of data various ratios relating to receivables management is calculated, the simple statistical techniques such as mean and ANOVA test were also applied to analyze the consistency, stability and overall trends in the different receivables management ratios of the sample units.

Empirical Analysis:

Receivable to Current Assets Ratio:

Ratio of receivable as a percentage of current assets would reveal the size of receivable. In current assets and the opportunity cost associated with the same; higher the percentage, higher the cost of carrying the receivable. It is therefore desired that a firm needs to carry the least percentage of receivable possible without affecting the sales volume.

This ratio is = Ending receivable X 100

Current assets

The ratio of receivable to current assets of the sample companies

Years	RIL	HPCL	IOC	CPCL	BRPL	Mean
1997	15.39	07.74	12.13	0.84	05.01	08.22
1998	12.52	12.67	18.49	01.94	04.61	10.05
1999	5.40	13.05	14.90	01.38	06.82	08.31
2000	10.73	09.30	19.92	12.30	08.29	12.11
2001	12.43	07.08	17.07	13.40	03.24	10.64
2002	14.00	04.00	17.72	22.78	10.30	15.53
2003	13.41	10.09	13.97	27.58	15.68	16.14
2004	14.05	10.61	12.87	22.81	10.96	14.26
2005	13.80	11.04	15.34	22.28	12.30	14.95
2006	16.94	12.65	15.89	22.62	16.25	16.87
Mean	12.87	10.71	15.83	14.79	09.35	12.71

Source: computed from data available in capital line data base

One-way ANOVA results for the ratios of receivable to current assets of sample companies						
Source of Variation	SS	Df	MS	F	Value	F Crit
Between Groups	294.33	4	73.58	2.49	0.056	2.58
Within Groups	328.60	45	29.52			
Total	1622.93	49				

SS = Sum of squares, df = degree of freedom, MS = Mean square, F cal = Calculated value of F ratio. P-value probability value of F ratio and F crit = Critical value of F ratio at 5% significant level.

Table 1 show that of all companies IOC had the highest average percentage of receivable to current assets, followed by CPCL, RIL and HPCL. BRPL and HPCL on the other hand were companies to have the least percentage of receivable to current assets, which is very far away from industry average. As suggested by Gitman (2001), an average manufacturing firm could afford to have percentage of receivable to current assets less than or equal to 37 %. When we compare with this suggested standard we find the situation across the industry to be better, with the overall average percentage of receivable to current assets at 12.71 While IOC had much lower percentage of receivable to current assets as against the standard. The One way ANOVA results, as given in Table 2shows the F cal. (2.49) is lower than F crit (2.58), which leads to the conclusion that ratios of receivable to current assets of sample companies differ significantly

Ratio of Receivable to Total Assets:

Percentage of receivable to total assets is another indicator of effective management of receivable. It is found out using the following formula: Ending receivable X 100

Total assets

Though Gitman (2001) suggested that an average manufacturing firm could not afford to have more than 16 % receivable to total assets, Mian and Clifford (1992) observed that even in an advanced economy like US, the percentage of receivable to total assets was 20% in an average manufacturing firm. However as far as the Indian context is concerned, Bhattacharya (2003) observed that an average Indian company maintained 26% of receivable to total assets, which is higher than the suggested standard and that of US manufacturing Firms. The percentage of receivable to total assets of sample companies is presented in Table 3.

Ratio of receivable to total assets (percent) of sampling companies						
Years	**RIL**	**HPCL**	**IOC**	**CPCL**	**BRPL**	**Mean**
1997	3.08	4.61	7.28	0.66	2.19	3.56
1998	2.97	4.08	7.02	1.48	2.01	3.51
1999	1.80	4.70	6.72	1.12	2.93	3.46
2000	3.17	4.58	10.40	7.13	3.60	5.78
2001	4.18	3.76	8.85	7.77	1.45	5.20
2002	5.04	5.20	7.03	11.11	3.56	6.39
2003	4.94	4.95	6.74	12.56	9.44	7.72
2004	4.59	5.38	6.21	9.11	6.88	6.44
2005	5.02	5.50	7.58	11.95	9.12	7.83
2006	4.70	5.61	7.31	13.69	12.11	8.68
Mean	3.95	4.84	7.51	7.66	5.33	5.86

Source: computed from data available in capital line data base

One-way ANOVA results for the ratios of receivable to total assets of sample companies						
Source of Variation	SS	Df	MS	F	P-Value	F Crit
Between Groups	109.39	4	27.35	3.25	0.020	2.58
Within Groups	378.66	45	8.41			
Total	488.05	49				

As seen in table 3, the 10 year industry average of receivable to total assets was 5.86. As against this HPCL managed receivable more effectively than other sample companies, whereas IOC and CPCL held much higher percentage of receivable to total assets. BRPL maintained d a reasonable percentage of receivable to total assets, closer to the industry aggregate. From the years 2002 percentage of receivable total assets, of all sample companies, however varied widely from the industry aggregate. The one-way ANOVA results for the ratio of receivable to total assets (Table 4) shows that F cal.(3.25) is greater than F Crit (2.58)It suggested that the ratio significantly across the samples.

Ratio of Receivable to Sales:

This ratio indicates the amount of receivable held by the company as a percentage of sales during a given period of time. This is computed to know the efficient of receivable management, the efficient of receivable management is inversely related to this ratio. Lower ratio reflects the firm's ability in doing larger business with lesser debtors. Increase in sale and decrease in debtor indicate the company's effective collection mechanism. As suggested by Hampton (1983), this could be computed as follow:

Ending receivable X 100 Sales

Ratio of receivable to Sales						
Years	RIL	HPCL	IOC	CPCL	BRPL	Mean
1997	11.66	2.69	4.33	1.24	2.39	4.46
1998	8.21	2.56	4.58	2.69	2.00	4.01
1999	5.26	2.01	4.04	1.99	2.95	3.25
2000	6.29	2.02	5.58	4.03	2.82	4.15
2001	5.55	1.26	4.21	3.47	1.14	3.13
2002	6.46	1.97	3.89	6.08	3.12	4.30
2003	6.56	1.77	3.69	7.56	7.33	5.38
2004	6.15	1.94	3.39	6.00	3.09	4.12
2005	5.96	1.74	4.09	6.30	3.83	4.38
2006	5.15	1.95	3.83	5.59	4.40	4.18
Mean	6.72	1.99	4.16	4.50	3.31	4.14

Source: computed from data available in capital line data base

One-way ANOVA results for the ratios of receivable to sales of sample companies						
Source of Variation	SS	Df	MS	F	P-Value	F Crit
Between Groups	121.20	4	30.30	13.12	3.67 E-07	2.58
Within Groups	103.93	45	2.31			
Total	225.13	49				

The ratio of receivable to sales of sample companies is presented in Table 5.

The data in Table 5 reveal that amount of receivable as percentage of sales across the industry on an average, was the highest of 5.38 percentages in 2003 and the lowest of 3.13 percentages in 2001. Of all companies, BRPL and HPCL were more efficient by holding less amount of investment in receivable as percentage of sale when compared to the yearly industry average, whereas RIL, IOC and CPCL were inefficient as it had the ratio above industry average every year. On an aggregate basis BRPL and HPCL were the only companies to maintain the receivable as percentage of sales below the industry aggregate. RIL, IOC and CPCL, on an average, could maintain the receivable almost on par with the industry aggregate.

The one-way ANOVA results for the ratios of receivable to sales of sample companies are given in table .6 since F cal. (13.12) which is greater than F Crit (2.58), we conclude that the ratios of receivables to sales of sample companies differ significantly.

Receivable Turnover Ratio and Average Collection Period:

Receivable turnover ratio measures the liquidity of debtor of a firm and average collection period indicates the average times lag (in days) between sales and collection thereof. The debtors' velocity also indicates receivable management efficiency rate. Higher turnover and lower collection period of receivable reflect the firm's ability in translating a larger business without corresponding increase in receivables. The reverse is the case with lower turnover and higher collection period. Mathur (2002) suggests that these ratios could be computed by the following formula.

Receivable Turnover Ratio (times) = **Sales** Average Receivable

Average Collection Period (days) = **365** Receivable Turnover Ratio

Receivable Turnover Ratio						
Years	RIL	HPCL	IOC	CPCL	BRPL	Mean
1997	13.82	51.92	28.28	82.33	19.64	39.20
1998	15.62	44.26	24.95	53.98	54.96	38.75
1999	19.32	63.53	27.39	52.17	45.97	41.68
2000	24.39	65.33	27.86	38.06	46.85	40.50
2001	23.3	83.38	26.34	31.14	58.17	44.47
2002	23.55	66.2	26.74	20.61	54.28	38.28
2003	17.51	66.16	31.24	17.67	22.9	31.10
2004	18.18	62.09	33.6	16.7	29.53	32.02
2005	20.56	64.11	31.79	23.02	37.78	35.45
2006	22.03	63.49	31.19	24.55	29.82	34.22
Mean	19.828	63.047	28.938	36.023	39.99	37.57

Source: computed from data available in capital line data base

One-way ANOVA results for the Receivable turnover of sample companies						
Source of Variation	SS	Df	MS	F	P-Value	F Crit
Between Groups	10466.2	4	2616.54	17.13	1E - 08	2.58
Within Groups	6873.0	45	152.73			
Total	17339.2	49				

The value of average receivable is obtained by dividing the sum of opening and closing receivable by2. The average collection period of the companies could be compared with the Tandon committee's suggestion norm of 68 days for the purpose of assessing the efficiency of receivable turnover (Table No.7)

As shown in Table 7. The receivable turnover of the industry varied between 31.10 times in 2003 and 44.47 times in 2001 and the overall industry aggregate ratio was 37.57 times. The receivable turnover of RIL and IOC were much below the yearly industry average from 1997 to 2006, which thereafter started increasing and reached at the highest of 34.22 times in 2006. RIL and IOC performed not as good as expected by standard. The data indicate that, on an aggregate basis HPCL, CPCL and BRPL were only the efficient companies to achieve higher turnover of receivable than the overall industry aggregate. The One-way ANOVA results for receivable turnover ratios of sample companies are shown in Table 8. Since F ca ; (17.13) which is greater than the table value of F. We conclude that the receivable turnover ratios of sample companies differ significantly.

Average Collection Period						
Years	RIL	HPCL	IOC	CPCL	BRPL	Mean
1997	9	4	8	9	9	8
1998	10	4	9	9	8	8
1999	10	4	9	9	8	8
2000	9	4	8	9	8	8
2001	10	5	11	10	8	9
2002	11	5	11	10	8	9
2003	14	5	10	11	8	10
2004	15	5	10	13	11	11
2005	15	6	10	12	10	11
2006	17	6	12	15	12	12
Mean	12	5	10	11	9	9

Source: computed from data available in capital line data base

Receivable to payable ratio of sample Companies						
Years	RIL	HPCL	IOC	CPCL	BRPL	Mean
1997	19.48	14.05	26.04	1.09	14.94	15.12
1998	17.46	15.02	30.74	2.48	14.26	15.99
1999	10.03	18.10	24.44	1.69	20.21	14.89
2000	26.20	15.19	33.75	4.37	18.91	25.68
2001	27.59	12.93	33.86	42.50	5.96	24.57
2002	42.06	18.30	26.28	56.47	7.34	30.09
2003	31.59	12.49	24.64	60.16	22.53	30.28
2004	31.02	15.51	24.10	49.84	26.54	29.40
2005	28.75	16.97	28.34	47.96	33.83	31.17
2006	33.14	18.83	28.27	53.34	48.85	36.48
Mean	26.73	15.74	28.05	34.99	21.34	25.37

Source: computed from data available in capital line data base

One-way ANOVA results for the Average collection period of sample companies						
Source of Variation	SS	Df	MS	F	P-Value	F Crit
Between Groups	298.32	4	74.58	21.34	6.38E -10	2.58
Within Groups	157.30	45	3.50			
Total	455.62	49				

One Way ANOVA results for ratio receivable to payable of sample Companies						
Source of Variation	SS	Df	MS	F	P-Value	F Crit
Between Groups	2105.84	4	526.46	3.129	0.024	2.58
Within Groups	7570.76	45	168.24			
Total	9676.59	49				

Average collection period of sample companies is presented in Table 9. On the basis, the receivable collection period across the industry varied between the highest 12 days in 2006 and the lowest of 8 days in 1997 to 2000 and the overall aggregate period was 9 days. As in the case of receivable turnover HPCL and BRPL were the only two very effective companies by holding receivable for a lesser period than the yearly industry average, whereas IOC and CPCL were highly ineffective by holding the receivable for a higher time period than the yearly industry average through our study period. On the other hand the collection period of RIL was more than the yearly industry average during the study period.

The one- way ANOVA results for the average collection periods of sample companies are presented in table No. 10. Since S. Cal (21.34) is greater than 2.58. Therefore we concluded that the average collection periods of sample companies differ significantly.

Receivable to Payable Ratio:

The ratio of receivable to payable would help the finance manager to establish the relationship between credit offered to the customers and credit obtained from the supplies of the company. The ratio computed as follows.

Receivable to payable ratio is : Average Payable Average Receivable

Though there are no specific standards to measure the effectiveness of this ratio, vause (2004) suggested that this ratio could be measured in unitary terms and be compared with the similar companies in the industry. The receivable to payable ratio of samples companies is shown in Table no. 11

As we could observe in table 11, CPCL extended higher units of credit to its customer during the entire period under review, when compared to other sample companies. HPCL extended much lower units of credit to its customers for every unit of credit to it obtained from its suppliers. The ten- year average ratios indicate that RPL extended the credit by 26.73 units for every unit of credit from its creditors, which is abnormally higher than that of industry aggregate of 25.37 units. The other three sample companies extended lower units of credit to their customers than the ten-year industry average of 25.37 for every unit of credit from suppliers. However, the overall picture reveals that all the sample companies had extended liberal credit facilities to their customer than the credit facility they enjoyed from their suppliers. The one- way ANOVA results pertaining to receivable to payable ratio of sample companies are depicted in Table 12. Since F cal (3.129) is greater than the table value of 2.58, we conclude that the ratio of receivable to payable of sample companies differ significantly.

Conclusion:

The study reveals that the level of investment in receivable as a percentage of sales across the industry was reasonably less. When benchmark against the industry average, HPCL and BRPL had recoded the poor performance in receivable management, Whereas CPCL did well. The average collection period across the industry was much less than the suggested norm during the study period. Though the collection period of all companies was less than the Tandon committee's suggested norms; In case of RIL and CPCL, it was higher than the industry average and in the case of HPCL collection period was lower than industry average.

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