

Analysis of Liquidity Management and Trade-off between Liquidity, Risk and Profitability: An Empirical Study

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Abstract

The study is based on different measures to assess the qualitative efficiency of liquidity management and liquidity, risk and profitability trade-off. It reveals that the overall performance regarding liquidity management at Infosys Technologies Limited was very good from the creditors' point of view but to the management's point of view, it reflects bad financial planning and inefficient tie up of liquid funds. The company maintained an excess amount of liquid funds during the period of study and its investment in current assets in relation to total assets was also high. But it showed greater efficiency both in working capital turnover and in realization of receivables. Although the behaviour patterns of the different indices indicate the sound liquidity management of the company, yet a few suggestions have been offered to improve certain factors like reduction in current assets through maintaining its optimum level, prompt recovery of debts through the preparation of periodical reports of the overdue, maintaining a definite proportion among the various components of working capital on the basis of past experience and strengthening the cash position through reducing the level of investment in current assets and collecting what is outstanding properly. The negative correlation between liquidity and profitability was an alarming feature, reflecting the unfavourable effect of liquidity on profitability. There was mildly positive association between the risk and profitability. It indicates that the high degree of conservative policy adopted by the company has made a negative impact on its profitability.

Keywords: *Liquidity, risk, profitability, 't'-test, ranking, assets.*

Liquidity refers to the ability of a concern to pay in cash its current obligations when they become due for payment by realizing amounts from current assets. Liquidity implies conversion of current assets into cash during the normal course of business and to have regular uninterrupted flow of cash to meet outside current liabilities as and when due and payable. It also ensures availability of money for day-to-day business operations (Kumar, 1991). It is an attribute that signifies the capacity to meet current financial obligations as and when required. In other words, liquidity is a concern's ability to meet its maturing obligations. Such liquidity of a firm may be ascertained by assessing its ability to hold necessary cash at the time

of meeting obligations. A concern must have a certain level of cash above its excepted needs to act as a reserve to meet emergencies.

The liquidity management is a prerequisite for the very survival of the concern. The short-term creditors of the firm are primarily interested in knowing the firm's ability to meet its current and short-term obligations. If the firm fails to meet such current obligations due to lack of liquidity position, its goodwill in the market is likely to be affected. Therefore a concern should have requisite degree of liquidity. It should be neither excessive nor inadequate. Excessive liquidity means accumulation of idle liquid funds, which may lead to lower profitability, increased speculation and unjustified expansion, whereas inadequate liquidity results in interruptions of business operations, lower rate of return and loss of business opportunities. A proper balance between these two extreme situations should be maintained for efficient operation of business through skilful liquidity management. Therefore, the concern's policies for managing liquidity should be designed to achieve the goals of adequate liquidity, minimization of risk, and maximizing the profitability.

Adequate Liquidity

Liquidity is a firm's ability to meet its maturing obligations. Such liquidity of a firm may be ascertained by assessing its ability to hold necessary cash at the time of meeting obligations. A firm must have a certain level of cash above its excepted needs to act as a reserve to meet emergencies. The liquidity management is a prerequisite for the very survival of the concern. The short-term creditors of the firm are primarily interested in knowing the firm's ability to meet its current- and short-term obligations. If the firm fails to meet such current obligations due to lack of liquidity position its goodwill in the market is likely to be affected. Therefore, a concern should have requisite degree of liquidity. It should be neither excessive nor inadequate.

Minimization of Risk

A firm should maintain adequate level of liquidity to meet the current obligations and maintain uninterrupted business operation. It should ensure that it does not suffer from lack of liquidity. The failure of the firm to meet its obligations due to lack of sufficient liquidity is highly risky as it will result in bad credit image, loss of creditors' confidence, unnecessary legal battles, interruptions of business operations, lower rate of return and loss of business opportunities or even closure of the firm. At the same time, if the level of liquidity is more, means accumulation of idle liquid funds, holding cost of current assets would be more, which may lead to lower profitability, increased speculation and unjustified expansion again would badly affect the profitability. A proper balance between these two extreme situations, therefore, should be maintained. In other words, the liquidity should not be either too high or too low. A well-monitored minimum level of liquidity at a calculated risk is always good for better profitability.

Maximizing the Profitability

The word profitability may be defined as the ability of a given investment to earn a return from its use. The overall objective of business is to earn at least a satisfactory

return on the funds invested in it, consistent with maintaining a sound financial position. Satisfactory return depends upon several factors including the nature of business, risk involved in business etc. If an enterprise fails to earn profit, invested capital is eroded and if this situation prolongs, the business enterprise may ultimately cease to exist. Modern management is engaged in the task of maximizing profits. The efficiency of a business concern is measured by the amount of profits earned. The larger the profit the more efficient and profitable the business become.

Liquidity, Risk and Profitability Trade-off

A firm can adopt three types of liquidity policies in connection with the trade-off between liquidity, risk and profitability. These are conservative policy, aggressive policy, and moderate policy.

Conservative policy: In the case of conservative policy, a firm will hold a relatively high proportion of current assets to total assets to play safe. As the rate of return on current assets is normally less than the rate of return on fixed assets, this policy will lead to lower profitability but at the same time it will signify lower risk of failure to meet the current obligations. Expressed in terms of ratios, conservative policy will result in a high current ratio.

Aggressive policy: In the case of aggressive policy, a firm opts for a lower level of liquidity thereby investing in current assets at a lower proportion to total assets. When a firm adopts this policy, the profitability is high but at high risk in meeting the current obligations or in achieving the desired level of turnover. Expressed in terms of ratios, aggressive policy will result in low current ratio with different degrees of financial flexibility.

Moderate policy: A policy adopted in between the conservative policy and aggressive policy is termed as moderate policy. In this case, the investment in current assets is neither too high nor too low. The profitability and risk are also moderate.

It may be concluded that for financing of current assets, a firm should decide upon two important constraints; firstly, the type of financing policy to be selected and secondly, the relative proportion of modes of financing. This decision is totally based on trade-off between risk and return. Aggressive policy of financing is less costly but risky, conservative policy financing is less risky but costly.

Keeping these theoretical backgrounds in view, a modest attempt has been made to make an in-depth study in respect of liquidity management and liquidity, risk and profitability trade-off of Infosys Technologies Limited, a leading information technology company of India. The study covers a period of ten years *i.e.* from financial year 1999-2000 to 2008-09.

Company Profile- Infosys Technologies Ltd.:

Infosys Technologies Ltd. which was established in 1991 is a leading consulting and an IT Service Solution Provider in India and abroad. It has six subsidiary companies as on March 31, 2009. The turnover of the Company during 2008-09 was Rs.20,264 crore with a post-tax profit of Rs.5,819 crore. The software export revenues aggregated Rs. 20,004 crore. Of these, 65.6 per cent of the revenue came from North America, 25.3 per cent from Europe and 9.1 per cent from the rest of

the world. Infosys defines design and delivers technology enabled business solutions that help Global 2000 companies win in a Flat World. It also provides a complete range of services by leveraging its domain and business expertise and strategic alliances with leading technology providers. Infosys' service offerings span business and technology consulting, application services, systems integration, product engineering, custom software development, maintenance, re-engineering, independent testing and validation services, IT infrastructure services and business process outsourcing. Infosys has a global footprint with over 50 offices and development centers in India, China, Australia, the Czech Republic, Poland, the UK, Canada and Japan.

Objectives of the Study

This study had the following objectives:

- (a) To measure and evaluate the efficiency of liquidity management by using the ratio analysis.
- (b) To compare the liquidity position of the company from year to year by applying Motaal's Comprehensive test.
- (c) To study the liquidity position of the company on the basis of some important parameters of liquidity management such as debtors to current assets ratio, cash and bank balance to current assets ratio and loans and advances (including other current assets) to current assets ratio.
- (d) To assess the association between the liquidity and profitability of the company with Spearman's rank correlation coefficient and test its significance.
- (e) To assess the trade-off between profitability and risk; and
- (f) To offer suggestions to improve the liquidity management of the company based on this study.

Limitation of the Study

This study had the following limitations:

- (a) The study is limited to ten years only *i.e.* from the year 1999-00 to 2008-09.
- (b) The study used the secondary data for analysis and interpretations collected from the published annual reports of the companies.
- (c) Apart from few statistical analyses, the study has been carried out mainly by employing ratio analysis technique.

Methodology of the Study

The study used the secondary data which have been taken from the published annual reports of Infosys Technologies Ltd. for the ten year period from 1999-00 to 2008-09. The data have been suitably re-arranged, classified and tabulated according to the requirements of the study. For analyzing the performance of liquidity management of the selected companies, the management accounting technique, ratio analysis and statistical techniques like measures of central tendency, measures of dispersion, Spearman's rank correlation, Motaal's Comprehensive test have been used. The students' 't' test has been applied to test the significance of rank correlation coefficients.

Findings of the Study

Important findings of the study were as under:

Efficacy of the Liquidity Management:

To assess the qualitative efficacy of the liquidity management of Infosys Technologies Ltd. during the study period, the comparison of size of working capital has been done. As the analysis based only on the size of working capital was not sufficient, the technique of analysis of liquidity ratios has been also used. A picture of the size of working capital and important liquidity ratios of the company have been depicted in **table I**.

Table – I: Size of Working Capital and Ratio Relating to Liquidity Management at Infosys Technologies Ltd

Years	Size of WC (In Crore Rs.)	CR (In Times)	ALR (In Times)	CATTAR (In %)	CATR (In Times)	WCTR (In Times)	WCSR (In %)	DTR (In Times)	ACP ACP Days)
1999-00	612	4.69	2.60	77.89	1.13	1.44	69.40	6.48	56
2000-01	798	3.49	1.20	65.37	1.70	2.38	41.97	6.29	58
2001-02	1293	3.82	1.68	69.02	1.49	2.01	49.67	7.73	47
2002-03	2018	3.87	1.90	76.35	1.33	1.80	55.70	7.07	52
2003-04	1220	1.65	0.87	60.42	1.53	3.90	25.63	7.53	48
2004-05	2385	2.77	1.10	56.63	1.84	2.88	34.76	5.48	67
2005-06	3832	2.73	1.48	66.37	1.49	2.36	42.45	5.95	61
2006-07	7137	4.91	3.02	69.01	1.47	1.84	54.28	5.74	64
2007-08	8496	3.28	1.72	71.00	1.28	1.84	54.29	5.06	72
2008-09	12288	4.72	2.73	73.85	1.30	1.65	60.64	5.98	61
Average	4008	3.59	1.83	68.59	1.46	2.21	48.88	6.33	59
S.D	3770	0.98	0.70	6.37	0.20	0.69	12.22	0.83	8
C.V. (%)	94.05	27.34	37.98	9.29	13.56	31.17	25.01	13.17	12.92

Note: WC = Working Capital; CR = Current Ratio; ALR= Absolute Liquidity Ratio; CATTAR = Current Assets to Total Assets Ratio; CATR = Current Assets Turnover Ratio; WCTR = Working Capital Turnover Ratio; WCSR=Working Capital to Sales Ratio; DTR = Debtors Turnover Ratio; ACP = Average Collection Period; S.D. = Standard Deviation and C.V. = Coefficient of Variation.

Source: Computed from the Annual Reports of Infosys Technologies Ltd. from 1999-2000 to 2008-09.

(1) Size of Working Capital:

Of the several measures, net working capital itself provides the one which indicates a 'margin of safety' or 'cushion' of protection provided for creditors (Burton, A. Kolb, 1983). The greater the amount of net working capital, the greater is the liquidity. The table I shows that Infosys had positive net working capital throughout the period of study and the quantum of working capital showed an increasing trend. The working capital increased from Rs. 612 crore in 1999-2000 to Rs. 12,288

crore in 2008-09, registering a growth of 1907.85 per cent during study period. The average size of working capital in Infosys was Rs. 4,008 crore which showed the good liquidity position of the company. The standard deviation was Rs. 3,370 crore and the coefficient of variation was 94.05 per cent.

(2) Current Ratio:

Current ratio is the relationship between current assets and current liabilities and shows the proportion of current assets available per unit of current liability. It is calculated by dividing current assets by current liabilities. It indicates the extent of soundness of the current financial position of a company and the degree of safety and security provided for the creditors. A good current ratio may mean a good umbrella for creditors against the rainy day, but to the management, it reflects bad financial planning or the presence of idle assets. Although there is no hard and fast rule, conventionally a current ratio of 2:1 is considered to be satisfactory. The table-I shows that the current ratio in Infosys varied between 1.65 times and 4.91 times. It is apparent that this ratio was always more than the hypothetical norm of 2:1, except in the year 2003-04. The ten years average current ratios of Infosys (3.59 times) shows that the liquidity position of the companies was very good from the creditors' point of view but to the management's point of view, it reflects bad financial planning and inefficient tie up of funds. Although no definite inference can be drawn on the basis of current ratio about the liquidity position of the company as the current ratio is a quantitative rather than a qualitative index of liquidity but in case of Infosys it is a rigorous and penetrating test of the liquidity position as there is no inventory in current assets of the company.

(3) Absolute Liquidity Ratio:

Absolute liquidity ratio establishes a relationship between absolute liquid assets and quick liabilities. This ratio is determined by dividing cash including bank balances and marketable securities by the amount of quick liabilities. Absolute liquidity ratio is a more rigorous test of the liquidity position of a concern. A high absolute liquidity ratio is good from the creditor's point of view but from the management point of view, it indicates poor investment policy. The acceptable norm for this ratio is 0.5:1 or 1:2. As per table-I the absolute liquidity ratio in Infosys during the ten years of the study period was always more than the standard ratio of 0.5:1 indicating good liquidity with regards to creditors. The ten years average absolute liquidity ratios of the company (1.83 times) was abnormally more than the standard indicating inefficiency in management of absolute liquid funds. It may be the policy of the company to maintain a high level of cash and bank balance for operating the enterprise but excessive liquidity may lead to lower profitability, increased speculation and unjustified expansion.

(4) Current Assets to Total Assets Ratio:

Current assets to total assets ratio expresses the relationship between the amount of current assets and the amount of investment in total assets. It indicates the extent of total funds invested for working capital purpose. It helps to assess the importance of current assets of a concern. Table-I shows that on the average more than 2/3 of the total assets of Infosys (68.59%) were current assets. It indicates that the major

portion of the total investment of the company was made for working capital purpose. Higher investment in current assets will increase the liquidity but it will decrease profitability. Heavy investment in current assets will lower the return on assets as funds tied up in idle cash and high level of debtors reduce profitability. The coefficient of variation of the ratio was 9.29 per cent which indicated that the level of investment in working capital out of total funds was consistent. It also confirmed the efficiency of liquidity management in Infosys.

(5) Current Assets Turnover Ratio:

Current assets turnover ratio indicates how effectively current assets are being utilized by the concern. This ratio is applied to measure the turnover and profitability of the total current assets employed to conduct the operation of a firm. The ratio is calculated by dividing the amount of sales by the amount of current assets. The higher the turnover, the better is the use of current assets. The lower the turnover of the current assets, the worse is the utilization of current assets. It is observed from table-I that the current assets turnover ratio in Infosys has fluctuated between 1.13 times and 1.84 times during the period of study. The overall average of the current assets turnover ratio for Infosys was 1.46 times with the coefficient of variation of 13.56 per cent. It signified that the performance in respect of current assets turnover ratio was not encouraging during the study period.

(6) Working Capital Turnover Ratio:

A close relationship exists between sales and working capital of a concern. Working capital turnover ratio helps to measure the efficiency of the utilization of net working capital. This ratio indicates the extent of working capital turned over in achieving sales of the firm. The higher the ratio the lesser is the investment in working capital and the greater is the efficiency and the larger is the rate of profit earned. A very high ratio is a sign of overtrading but a low ratio indicates under trading, *i.e.* working capital is not efficiently utilized. Table-I depicts that the working capital turnover ratio of Infosys was also showed fluctuating trend and fluctuated between 1.44 times and 3.90 times during the period of study. On the average Infosys maintained working capital turnover ratio at 2.21. It signified that the performance in respect of efficient utilization of short-term funds in the company was not satisfactory during the study period.

(7) Working Capital to Sales Ratio:

Working capital to sales ratio tested the efficiency with which the short-term funds were used. A high ratio was a sign of possible inefficiency in the use of short-term financial resources by the company. A lower ratio implied by and large a more efficient use of funds. Table-I reveals that in Infosys this ratio varied between 25.63 per cent and 69.40 per cent. The coefficient of variation of working capital to sales ratio for Infosys was 25.01 per cent. On the average, Infosys maintained 48.88 per cent working capital to its sales. It signified that Infosys had showed average performance in terms of efficient utilization of its short-term funds.

(8) Debtors Turnover Ratio:

The debtors' turnover ratio indicates the speed with which debtors are converted

into cash. It throws light on the credit and collection policy adopted by a concern. This ratio measures the rapidity or slowness of debtors' collection. Generally, the higher the turnover, the more efficient is the trade credit management. On the other hand, low debtors turnover implies inefficient management of debtors and less liquid debtors. Table-I reveals that the debtors turnover ratio of Infosys ranged from 5.06 in 2007-08 to 7.73 in 2001-02 and on the average, it was 6.33 during the study period. It indicated that the performance of debtors' management as well as the liquidity of debtors at Infosys was good. The company showed consistency in relation of debtors; as the coefficient of variation of debtor turnover ratio was low at 13.17 per cent.

(9) Average Collection Period:

The average collection period refers to the average time lag between sales and collection measurable in terms of number of days. It is a significant measure of the collection activity and quality of accounts receivables. Prolonged collection period owing to delays and other reasons creates hazards in the way of sustaining business operations because of financial scarcity. A shorter collection period signifies better credit management and liquidity of accounts receivables. A rule of thumb is that the collection period should not exceed 1/3 times the regular credit period. Table-I evidences that the average collection period in Infosys was the lowest (47 days) in 2001-02 and the highest (72 days) in 2007-08 and on the average, it was 59 days during the ten years of study period. It indicates the liberal credit policy adopted by the company and the performance of credit management in the company was not satisfactory. However, Infosys showed consistency in relation of credit management, as the coefficient of variation of average collection period was 12.92 per cent.

Consistency among the Parameters of Liquidity Management

With the help of the statistical technique of coefficient of variation, an attempt has also been made to measure the consistency among the parameters of liquidity management more precisely. The coefficient of variation (CV) is the most commonly used method where the variability between two or more variables is compared. The variable for which CV is less is regarded as less fluctuating, more consistent, more stable or more homogenous. On the other hand, the variable for which CV is greater is said to be more fluctuating or conversely less consistent, less stable or less uniform. Table-I reveals that out of the different parameters of liquidity management, current assets to total assets ratio is most consistent and stable followed by average collection period, debtors turnover ratio, current assets turnover ratio, working capital to sales ratio, current ratio, working capital turnover ratio and absolute liquidity ratio. More consistency and stability in current assets to total assets ratio supports our earlier conclusion that the company had always maintained maximum investment in current assets.

Liquidity Ranking:

The liquidity position of a concern is largely affected by the composition of working capital. Therefore, in order to evaluate the liquidation position of the Infosys more precisely, Motaal's comprehensive test has been applied. In this test, a method of

ranking has been applied to arrive at a more comprehensive assessment of liquidity in which three different factors *viz.* debtors to current assets ratio, cash and bank balance to current assets ratio and loans and advances (including other current assets) to current assets ratio have been computed and combined in the point score. Debtors to current assets ratio, cash and bank balance to current assets ratio and loans and advances (including other current assets) to current assets ratio, a high value indicates relatively favourable position and ranking has been done in that order. Ultimate ranking has been done on the principle that lower the point scored the more favourable is the liquidity position and *vice versa*.

Table-II reveals that the liquidity position of Infosys was best in the year 2000-01. The year 2006-07 occupied the second position and the year 2004-05 occupied the third position and the years 1999-00, 2003-04, 2005-06, 2007-08 and 2008-09 jointly occupied the fourth position followed by the years 2001-02. The year 2002-03 occupied the last rank regarding liquidity position during the study period. The fluctuation in the liquidity position over the different years of the period of the study may be a point for investigation into the financial affairs of the company.

Table-II: Statement of Liquidity in Order of Ranking of Infosys Technologies Limited

Years	As % to total Current Assets			Liquidity Rank				
	Debtors	Cash	Loans & Advances	Debtors	Cash	Loans & Advances	Total Rank	Ultimate Rank
1999-00	17.50	55.49	27.01	10	3	4	17	6 (IV)
2000-01	27.05	34.45	38.50	2	10	1	13	1 (I)
2001-02	19.21	44.06	36.73	8	8	2	18	9 (V)
2002-03	18.82	49.11	32.07	9	7	3	19	10 (VI)
2003-04	20.38	52.78	26.84	7	5	5	17	6 (IV)
2004-05	33.58	39.71	26.71	1	9	6	16	3 (III)
2005-06	25.10	54.21	20.69	5	4	8	17	6 (IV)
2006-07	25.58	61.46	12.96	3	1	10	14	2 (II)
2007-08	25.30	52.58	22.12	4	6	7	17	6 (IV)
2008-09	21.74	57.97	20.29	6	2	9	17	6 (IV)

Source: Computed from the Annual Reports of Infosys Technologies Ltd. from 1999-2000 to 2008-09.

Correlation between Liquidity and Profitability:

An attempt has been made to measure the degree of association between liquidity and profitability of the Infosys by using Spearman's rank correlation coefficient. With a view to examine whether the computed value of such correlation coefficient is significant or not, student's 't' test has been applied. For this purpose, the ratio of current assets to total assets has been used as the 'liquidity' indicator and the ratio of return on average capital employed has been taken as the 'profitability' parameter.

Formulation of Hypotheses:

Null Hypothesis (H_0): There is no significant correlation between liquidity and profitability.

Alternative Hypothesis (H_1): There is significant correlation between liquidity and profitability.

Level of Significance: 5 %

Degree of Freedom: 8

Critical Value of 't': 2.31

Computed Value of 't': (-)1.445

Rank Correlation between Liquidity and Profitability: (-) 0.455

Table-III reveals that in Infosys the rank correlation coefficient between liquidity and profitability was (-)0.455 which signifies that there exists negative relationship between the liquidity and profitability of the company. The computed value of 't' (-)1.445 is less than the critical value of 't'(2.31) at 5 per cent level of significance which is statistically insignificant. Hence, the null hypothesis is accepted which signifies that although the degree of association between liquidity and profitability of the company was negative, the degree of influence of liquidity on its profitability was insignificant.

Table-III: Rank Correlation between Liquidity and Profitability of Infosys Technologies Limited

Year	Current Assets to total assets (%)	Liquidity Rank	Return on Average Capital Employed (%)	Profitability Rank	Rank Difference (d)	D ²
1999-00	77.89	1	46.27	6	5	25
2000-01	65.37	8	62.62	1	7	49
2001-02	69.02	5	54.37	2	3	9
2002-03	76.35	2	46.91	5	3	9
2003-04	60.42	9	48.10	4	5	25
2004-05	56.63	10	51.43	3	7	49
2005-06	66.37	7	44.89	8	1	1
2006-07	69.01	6	45.73	7	1	1
2007-08	71.00	4	41.38	10	6	36
2008-09	73.85	3	42.90	9	6	36
						240

Rank Correlation = (-) 0.455

t = (-) 1.445

Source: Computed from the Annual Reports of Infosys Technologies Ltd. from 1999-2000 to 2008-09.

Correlation between Risk and Profitability:

In order to analyze the trade-off between risk and profitability, the risk analysis of working capital management has been done to assess the extent of current assets maintained by Infosys, adequate enough to meet the current obligations and also to support the given level of operation. Enterprises are said to follow an aggressive approach when the current assets are financed only by short-term sources and a conservative approach when the current assets are financed by both short-term and long-term sources. The risk faced by a firm can be measured with the following formula;

$$R_k = [(E_j + L_j) - A_j] / C_j$$

where, R_k = Risk Factor

E_j = Equity + Retained Earnings

L_j = Long-term Loans

A_j = Fixed Assets

C_j = Current Assets

The above measure indicates the extent of current assets financed by long-term funds after fixed assets are financed in full. Based on the above formula, the following inferences can be drawn.

- Value of R_k is zero or less would mean that the firm is following an aggressive policy and normally profitability would be high, and
- Value of R_k is 1 or close to 1 would mean that the firm is following a conservative approach and normally profitability would be low.

Formulation of Hypotheses:

Null Hypothesis (H_0): There is a negative association between risk and profitability, and

Alternative Hypothesis (H_1): There is a positive association between risk and profitability.

Level of Significance: 5 %

Degree of Freedom: 8

Critical Value of 't': 2.31

Computed Value of 't': 0.61

Rank Correlation between Liquidity and Profitability: (+)0.21.

Table-IV reveals that Infosys has adopted a modest conservative policy in financing the working capital during the study period. The positive risk factor reveals that Infosys had been in a more conservative mood to the extent that long-term sources have also been used as a source of finance for current assets. The correlation coefficient (r) for ranked data of risk and profitability is worked out as (+)0.21 indicates that there is a positive association between the two variables, *viz.* risk and profitability. Since the calculated value of 't' is less than the table value, null hypothesis H_0 is accepted and concludes that there exists no significant relationship

between the risk and profitability of the company. They are mildly related to each other.

Table-IV: Rank Correlation between Risk and Profitability of Infosys Technologies Limited

Year	Equity & RE	LT Loan	FA	CA	RK	Risk Rank	Return on Avg. Capital Employed (%)	Profitability Rank	Rank Difference (d)	D ²
1999-00	833	Nil	220.87	778.10	0.787	8	46.27	6	2	4
2000-01	1390	Nil	592.14	1117.71	0.714	5	62.62	1	4	16
2001-02	2080	Nil	786.59	1752.82	0.738	6	54.37	2	4	16
2002-03	2861	Nil	843.08	2721.15	0.742	7	46.91	5	2	4
2003-04	3253	Nil	2032.88	3103.64	0.393	1	48.10	4	3	9
2004-05	5242	Nil	2857.42	3730.62	0.639	3	51.43	3	0	0
2005-06	6897	Nil	3065.00	6049.00	0.633	2	44.89	8	6	36
2006-07	11162	Nil	4025.00	8961.00	0.796	10	45.73	7	3	9
2007-08	13490	Nil	4994.00	12227.00	0.695	4	41.38	10	6	36
2008-09	17809	Nil	5521.00	15593.00	0.788	9	42.90	9	0	0

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Rank Correlation = (+)0.21

t = 0.6075

Note: The rank for risk factor has been taken in ascending order because of the inferences stated above.

Source: Computed from the Annual Reports of Infosys Technologies Limited from 1999-2000 to 2008-09.

Conclusions

1. The study of the liquidity with the help of net working capital evidences a sound liquidity position of Infosys Technologies Limited.
2. The current assets were on average 68.59 per cent of the total assets indicating much investment in current assets.
3. The overall liquidity position of the company from the viewpoint of conventional standards of current ratio and absolute liquidity ratio might be said to be very good.
4. The average collection period indicates a liberal credit policy of the company.
5. The performance in respect of current assets turnover ratio and working capital turnover ratio was not encouraging during the study period.
6. The structural determinants of the working capital reveal that on average cash and bank balance constituted the highest (50.18%) of gross working capital

followed by loans and advances (26.39%) and debtors (23.43%).

7. The rank correlation between liquidity and profitability shows that these two were negatively related to each other.
8. The rank correlation between risk and profitability indicates that there exists no significant relationship between the risk and profitability of the company. They are mildly related to each other.

Suggestions

The investment in current assets was much higher in Infosys Technologies Limited which should be reduced. The optimum level of current assets should, therefore, be maintained by considering the concept of liquidity and profitability.

- The degree of association between liquidity and profitability of the company was negative, therefore, excessive liquidity which may lead to lower profitability should be controlled through skilful liquidity management.
- There is a need for immediate improvement in the debtors and debt collection policy because debtors were not properly managed due to liberal credit policy. The management should put more stress on the recovery of debts to reduce the number of days its debtors are outstanding in order to reduce the length of the time during which it finances its customers' sales.
- With a view to improving the quality of debtors and bringing down the amount tied up in debtors, a periodical report of the overdue may be prepared and effective steps may be taken to expedite the collections.
- The structural determinants of the working capital of the company reveal that the cash and bank balance contributed the highest to the gross working capital, therefore, to ensure optimum liquidity position the management should try to bring down the amount tied up in cash and bank balance.
- The management of the company should also try to maintain a definite proportion among the various components of the working capital in relation to the overall current assets on the basis of their past experience to keep an adequate quantum of liquidity all the times.
- The company should give special attention to the management of current assets and all the relevant techniques of liquidity management should be employed to maintain overall control over liquidity position.

The study of liquidity management occupies an important place in financial management. Efficient management of liquidity could be ascertained by a firm's ability to meet maturing debts or obligations. It may be concluded that the overall performance regarding liquidity management at Infosys was very good from the creditors' point of view but to the management's point of view, it reflects bad financial planning and inefficient tie up of liquid funds. Infosys maintained an excess amount of liquid funds during the period of study and its investment in current assets in relation to total assets was also high. Infosys showed inefficiency both in working capital turnover and in realization of receivables. The negative correlation between liquidity and profitability was an alarming feature, reflecting

the unfavourable effect of liquidity on profitability. There was mildly positive association between the risk and profitability. On the basis of above analysis of liquidity management of the company, it may be concluded that it maintained a larger amount of idle liquid funds.

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