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- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio," Ohio State University.

Contributions to books

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

Journal and other articles

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

Conference papers

- Chandel K.S. (2009): "Ethics in Commerce Education." Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

Unpublished dissertations and theses

- Kumar S. (2006): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

Online resources

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Website

- Kelkar V. (2009): Towards a New Natural Gas Policy, Economic and Political Weekly, Viewed on February 17, 2011 http://epw.in/epw/user/viewabstract.jsp

SOLVENCY ANALYSIS OF PUBLIC SECTOR UNDERTAKING: A CASE STUDY OF POWER FINANCE CORPORATION LIMITED (PFCL)

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ABSTRACT
Solvency is the overall stability of a business enterprise. Solvency can be determined in short term as well term period. Solvency ratio measured in short term is known as liquidity and in the long term is known as stability. Short term solvency ratio can be classified into current ratio, quick ratio and acid test ratio. The long term solvency was measured using Debt equity ratio, Proprietary ratio, Fixed Assets ratio, Capital gearing ratio, Debt service coverage ratio & Solvency ratio. The objective of this study was to examine the solvency position of a sample company and testing significance of correlation .To assess the critical factors which affect the solvency of Power Finance Corporation Limited (PFCL) and to give some suggestions for the betterment of future solvency on the basis of findings of the study. The study has been conducted by selecting a few important parameters such as Assets, Liquid assets, Absolute liquid assets, Debt, Equity, Fixed interest or dividend bearing funds, Tangible assets, Outsiders Liabilities. For making the analysis of solvency position of PFCL, ratio analysis techniques of Financial Management have been used. For assessing the behavior of above ratios, Statistical techniques have been used i.e. Arithmetic Mean, Standard Deviation, Co-efficient of Correlation and Student t-test. By the observations of this study, it is found that the short and long term solvency position of PFCL was not satisfactory. The company should improve their short term stability by increasing the current assets and decreasing current liabilities. The long term solvency can improve by increasing equity share capital and decreasing debt capital.

KEYWORDS
Current Assets, Liquid assets, Absolute liquid assets, Debt, Equity, Fixed interest or dividend bearing funds, Tangible assets, Outsiders Liabilities.

INTRODUCTION
Solvency is the overall stability of a business enterprise. Solvency can be determined in long term as well as short term period. Solvency ratio measured in short term is known as liquidity and in the long term is known as stability. Short term solvency ratio can be classified into current ratio, quick ratio and acid test ratio. Current ratio is an indicator of firm's financial stability i.e. an index of technical solvency and the strength of working capital. The logic behind current ratio is that cash need not be immediately available to meet all current liabilities on a particular date, but there should be good prospects for an adequate inflow of cash indicated by the amount of individual components of current assets. The absolute liquidity is represented by cash and cash near items, such as marketable securities. The long term solvency ratio includes Debt-Equity ratio, proprietary ratio, debt service coverage ratio, capital gearing ratio etc. The Debt-Equity ratio enables one to ascertain the proportion of shareholders `stake in the business. This ratio indicates the extent of cushion available to creditors on liquidation. The proprietary ratio indicates the long term or future solvency position of the business. This ratio is a test of the capital structure of the company. The Debt service coverage ratio indicates whether business has earned sufficient profits to pay periodically the interest charges. It is an indicator of the financial strength of an enterprise and an index of margin of safety of long term creditors. The capital gearing ratio indicates the proportion between funds bearing fixed interest or dividend bearing funds and funds not bearing fixed interest or dividend. This ratio reveals the suitability of company's capitalization. So solvency is a very important aspect for the short term and long term existence of the business.

JUSTIFICATION OF THE TOPIC
Solvency is a measure of the company's short term and long term stability. The solvency ratio plays a very important role among the parties interested in the enterprise. The investors, creditors, bankers, suppliers, financial institutions, government etc. uses these ratios to judge the stability of the enterprise. The financial institutions and individuals may be interested in investing in that company's which is financial stable. The solvency ratios enable the investors to judge whether their investment is secured or not. This ratio enables them to analyze the capital structure position of company. The financial Institution and Government will be interested in an enterprise which is financially stable. So solvency is a very important aspect of judging financial stability of a concern. Against their background a study was conducted about the solvency position of Power Finance Corporation Limited (PFCL).

REVIEW OF LITERATURE
"Jagadeeshal" et al (1990) in their study on the performance of Tungabhadra Grammena bank in Karanataka assessed growth of the bank is terms of the physical and financial indicators employing ratio analysis. They found that there was substantial increase in the physical and financial indicators of the bank . The current ratio was 1.68, Credit-Deposit ratio was 183.85% and net capital ratio was 1.02. However the margin of profit earned by the bank was too low.

Natarajan et al (1980) analyzed the working of consumer cooperative in Andhra Pradesh and assessed that the current ratio of 28% quick ratio of 1:1 are best standards of evaluation of solvency. The results of their analysis showed that the liquidity was not satisfactory. The poor performance of consumers cooperative were excess of financing over equity and ineffective utilization of funds.

The pioneering works done by Cornelis Compagne in the Netherlands and at the end of the 1940's and by Teivo Penikainen in Finland in the beginning of 1950's are importance, as they introduced the solvency research for insurance undertaking e.g. Pentikainen (1952), Compagne (1961), and Compagne, Vander & Yntema (1948). Lee and Urrulia (1996) found that current liquidity ratio is a significance indicator of solvencies. The stability of the liquidity ratio is a necessary measure of corporate solvency (Dambolena and Khoury, 1980)

OBJECTIVE OF THE STUDY
This study has the following objectives:

- To analyze the short-term solvency position of Power Finance Corporation Limited.
- To analyze the Long-term Solvency position of Power Finance Corporation Limited.
- To analyze how far profitability is affecting by solvency.
- To give suggestions on the basis of findings of the study.

COMPANY PROFILE

Power Financial corporation limited (PFCL) was set up in July 1986 as a Financial Institution (FI) dedicated to Power Sector financing and committed to the integrated development of the power and associated sectors. The Corporation was notified as a Public Financial Institution in 1990 under Companies Act, 1956. The Corporation was registered as a Non Banking Financial Company by RBI and has been conferred with the status of Nav-Ratna PSU by Govt. of India on 22nd June, 2007

PFC is providing large range of Financial Products and Services like Project Term Loan, Lease Financing, Direct Discounting of Bills, Short Term Loan, and Consultancy Services etc, for various Power projects in Generation, Transmission, and Distribution sector as well as for Renovation & Modernization of existing power projects.

Ministry of Power, Central Electricity Authority and PFC are working together to facilitate development of Ultra Mega Power Projects with the capacity of about 4000 MW each under Tariff based competitive bidding route. Being large in size, these projects will meet the power needs of number of states through transmission of power on regional and national grids

LIMITATIONS OF THE STUDY

The following are the limitationS of the study:

1. The study covers only 10 years period i.e. 2000-2001 to 2009-2010 for the solvency analysis of PFC Ltd.
2. The secondary data's used in this study have been taken from published annual reports only.
3. As per the requirement and necessarily some data's have been grouped and sub-grouped.
4. For making the analysis of solvency position of PFCL, ratio analysis techniques of financial management have been used.

RESEARCH DESIGN & METHODOLOGY

In this study the sample company named PFCL has been taken for analysis of solvency. Present study is based on secondary data i.e. published annual reports of the company. These financial data's are edited, classified and tabulated as per the requirements of the study. This study has covered 10 years data's from 2000-2001 to 2009-2010 for analyzing the solvency position of PFCL

The short and long term solvency position of PFCL have been analyzed by financial techniques i.e. Ratio Analysis. The collected data have been analyzed by the various ratios which are related to short and long term solvency position of the business.

For assessing the behavior of above ratios, Statistical techniques have also been used i.e. Arithmetic Mean, Standard Deviation, Co-efficient of Correlation and Student t-test.

HYPOTHESIS OF THE STUDY

This study is based on the following null hypothesis:

- There is no significant difference in the short term solvency position of PFCL as compared to previous years
- There is no significant difference in the long term solvency position of PFCL as compared to previous years

ANALYSIS OF SOLVENCY POSITION OF PFCL

The solvency positions of PFCL have been analyzed by ratio analysis techniques. In this study we have used various ratios for judging the overall solvency position of the company. In this regard we have calculated the following ratios:

- Current ratio
- Absolute liquid ratio
- Debt equity ratio
- Proprietary ratio
- Fixed Assets ratio
- Capital gearing ratio
- Debt service coverage ratio
- Solvency ratio

CURRENT RATIO

Current ratio is defined as the ratio if current assets to current liabilities. It is an index of technical solvency and an index of the strength of the working capital. A high current ratio is an assurance that a firm will have adequate funds to pay current liabilities and other current payments. It can be calculated as following:

$$= \frac{\text{Current Assets}}{\text{Current liabilities}}$$

TABLE 1: STATEMENT OF CURRENT ASSETS TO CURRENT LIABILITIES (RS IN CRORES)

Year	Current Assets (Rs)	Current Liabilities(Rs)	Current Ratio (Times)
2000 – 2001	1250.71	753.91	1.66
2001 – 2002	777.91	999.17	0.78
2002 – 2003	893.72	1146.96	0.78
2003 – 2004	1174.50	694.17	1.69
2004 – 2005	1071.32	614.06	1.74
2005 – 2006	1785.34	1457.18	1.23
2006 – 2007	2620.25	2111.92	1.24
2007 – 2008	2989.56	2415.80	1.24
2008 – 2009	3668.55	3576.16	1.03
2009-2010	4815.47	3697.52	1.30
Mean	2104.73	1746.68	1.27
Growth Rate (%)	285.02	390.44	-21.50
Annual Growth Rate (%)	**28.50**	**39.04**	**-2.15**

Source: Annual reports of PFCL from 2000-2001 to 2009-2010(pg.no.58, 59)

The above indicated table no. 1 shows the relation between current asset and current liabilities. During the study period current ratio showed a fluctuating tendency. The highest ratio of 0.65 was observed in the year 200-2001 and the least of 0.78 in the year 2001-02 and 2002-2003. During the years 2006-2009 the ratio shows a decreasing tendency. The current ratio had a decreasing annual growth rate of -2.15% with an average of 1.27. Except in the financial year 2001-2002 & 2002-2003 the ratio was above 1 and showed a consistency of 0.78.

ABSOLUTE LIQUID RATIO

Absolute liquidity is represents by cash and near cash Items. The absolute liquid assets many include cash, Bank and marketable securities. This ratio indicates how much immediate liquid assets is available per rupee of current assets. The ideal ratio is 0.5:1. It can be calculated as follows:

$$= \frac{\text{Absolute Liquid Assets}}{\text{Current Liabilities}}$$

TABLE 2: STATEMENT OF ABSOLUTE LIQUID ASSETS TO CURRENT LIABILITIES (RS IN CRORES)

Year	Absolute Liquid Ratio (Rs)	Current Liabilities (Rs)	Absolute Liquid Ratio (Times)
2000 – 2001	546.19	753.91	0.72
2001 – 2002	95.72	999.17	0.10
2002 – 2003	102.07	1146.96	0.09
2003 – 2004	353.02	694.17	0.51
2004 – 2005	338.37	614.06	0.55
2005 – 2006	364.84	1457.18	0.25
2006 – 2007	507.67	2111.92	0.24
2007 – 2008	674.50	2415.80	0.28
2008 – 2009	392.23	3576.16	0.11
2009-2010	1394.30	3697.52	0.38
Mean	476.89	1746.68	0.32
Growth Rate (%)	155.28	390.44	-47.95
Annual Growth Rate (%)	15.53	39.04	-4.79

Source: Annual reports of PFCL from 2000-2001 to 2009-2010(pg.no.58, 59)

The above indicated table No. 2 represents the relation between absolute liquid assets and current liabilities. The ratio was below 1 during the period of study. The highest ratio of 0.72 was in the year 2000-2001 and the least of 0.09 was in the year 2002-2003. . The annual growth rate of absolute liquid ratio showed negative trend of -4.79%. The rate of increase of current liabilities was higher than the rate of increase assets, which showed a negative short term solvency. The absolute liquid ratio showed a fluctuating tendency with an average of 0.32.

DEBT-EQUITY RATIO

Debt-equity ratio relates all external liabilities to Owner's recorded claims. It indicates the firm's obligation to outsiders in relation to owners. If the owner's interest is greater than that of the creditors, the financial position is highly solvent. It is also known as "External-Internal Equity Ratio". It can be calculated as follows.

$$= \frac{\text{Total long-term Debt}}{\text{Shareholders fund}}$$

TABLE 3: STATEMENT OF TOTAL LONG-TERM DEBT TO SHAREHOLDERS FUND (RS IN CRORES)

Year	Long term Debt (Rs)	Shareholders Fund (Rs)	Debt-Equity Ratio (Times)
2000 – 2001	9317.14	3809.59	2.45
2001 – 2002	10981.81	4398.08	2.50
2002 – 2003	14364.10	5332.02	2.69
2003 – 2004	17748.03	6575.76	2.70
2004 – 2005	21648.24	6380.16	3.39
2005 – 2006	26924.82	6938.16	3.88
2006 – 2007	33584.18	8593.09	3.91
2007 – 2008	40647.81	9329.85	4.36
2008 – 2009	52160.15	11507.80	4.53
2009-2010	67108.41	13260.80	5.06
Mean	29448.47	7612.53	3.55
Growth Rate (%)	620.27	248.09	106.92
Annual Growth Rate (%)	62.03	24.81	10.69

Source: Annual reports of PFCL from 2000-2001 to 2009-2010(pg.no.58, 59)

The above indicated table No. 3 shows the relation between total long term debt and shareholders fund. During the period of study the debt equity ratio showed an increasing trend with an annual growth rate of 10.69%. The rate of increase of total long term debt was 2.5 times more than the shareholders fund. The highest ratio of 5.06 was in the year 2009-2010 and the least of 2.5 in the year 2000-2001.During the study period ratio showed an increasing tendency from 2.45-5.06.The ratio showed an increasing trend with an average of 3.55.

SOLVENCY RATIO

This ratio is a small variant of equity ratio. It helps the outsiders to judge the security of their investment. This ratio indicates the relationship between the total liabilities to outsiders as to total assets of a firm. It can be calculated as follows:-

$$= \frac{\text{Total Liabilities to Outsiders}}{\text{Total Assets}}$$

TABLE 4: STATEMENT OF TOTAL LIABILITIES TO OUTSIDERS TO TOTAL ASSETS (RS IN CRORES)

Year	Total Liabilities to Outsiders (Rs)	Total Assets (Rs)	Solvency ratio (Times)
2000 – 2001	10071.05	1475.97	6.82
2001 – 2002	11980.98	961.32	12.46
2002 – 2003	15511.06	1031.54	15.04
2003 – 2004	18442.20	1253.56	14.71
2004 – 2005	22262.30	1138.70	19.55
2005 – 2006	28381.99	1840.71	15.42
2006 – 2007	35696.10	2701.67	13.21
2007 – 2008	43063.61	3066.51	14.04
2008 – 2009	55736.31	3742.08	14.89
2009-2010	70805.93	4886.65	14.49
Mean	31195.15	2209.87	14.06
Growth Rate (%)	603.06	231.08	112.35
Annual Growth Rate (%)	60.31	23.11	11.24

Source: Annual reports of PFCL from 2000-2001 to 2009-2010(pg.no.58, 59)

The above indicated table no.4 shows the relation between total liabilities to outsiders to total assets. Solvency ratio showed an increasing trend with an annual growth rate of 11.23%.the highest ratio of 19.55 was observed in the year 2004-2005and the least of least of 6.82 in the year 2000-2001. The last three years of study showed a consistency of above 14. The growth rate of total liabilities to the outsiders was double the total assets of the company. The ratio showed a fluctuating tendency with an average of 17.96.

PROPRIETARY RATIO

The ratio relates the shareholders funds to total assets. This ratio indicates the long-term or the future solvency position of the business. This indicates the extent to which the assets of the company can be lost without affecting the interest of creditors of the company. It can be calculated as follows:

$$= \frac{\text{Shareholders fund}}{\text{Total tangible assets}}$$

TABLE 5: STATEMENT OF SHAREHOLDERS FUND TO TOTAL TANGIBLE ASSETS (RS IN CRORES)

Year	Shareholders fund (Rs)	Total tangible assets (Rs)	Proprietary Ratio (Times)
2000 – 2001	3809.59	1475.97	2.58
2001 – 2002	4398.08	961.32	4.58
2002 – 2003	5332.02	1031.54	5.17
2003 – 2004	6575.76	1253.56	5.25
2004 – 2005	6380.16	1138.70	5.60
2005 – 2006	6938.16	1840.71	3.77
2006 – 2007	8593.09	2701.67	3.18
2007 – 2008	9329.85	3066.51	3.04
2008 – 2009	11507.80	3742.08	3.08
2009-2010	13260.80	4886.65	2.71
Mean	7612.53	2209.87	3.96
Growth Rate (%)	248.09	231.08	5.14
Annual Growth Rate (%)	24.81	23.11	0.51

Source: Annual reports of PFCL from 2000-2001 to 2009-2010(pg.no.58, 59)

The above indicated table no.5 shows the relation between shareholders fund and total tangible assets. During the period of study the ratio showed a fluctuating tendency between 2.58 to 5.60. The highest ratio of 5.60 was in the year 2004-2005and the least of 2.58 in the year 2000-2001.The first 5 years increasing trend and the remaining years showed a decreasing trend. The shareholders fund and tangible assets showed a similar growth rate of around 24%. The ratio had an average of 3.96 with an annual growth rate of 0.51%.

FIXED ASSETS RATIO

This ratio explains whether the firms have raised adequate long term funds to meet its fixed assets requirement. The ratio should not be more than 1. If the total long term funds are more than total fixed assets, it means that a part of the working capital requirement is met out of the long term funds of the firm. It is calculated as follows:

$$= \frac{\text{Fixed Assets}}{\text{Long Term Funds}} \times 100$$

TABLE 6: STATEMENT OF FIXED ASSETS TO LONG TERM FUNDS (RS IN CRORES)

Year	Fixed Assets (Rs)	Long Term Funds (Rs)	Fixed Assets Ratio (%)
2000 – 2001	225.26	13126.73	1.72
2001 – 2002	183.41	15379.89	1.19
2002 – 2003	137.82	19696.12	0.70
2003 – 2004	79.06	24323.79	0.33
2004 – 2005	67.38	28028.40	0.24
2005 – 2006	55.37	33862.98	0.16
2006 – 2007	81.42	42177.27	0.19
2007 – 2008	76.95	49977.66	0.15
2008 – 2009	73.53	63667.95	0.12
2009-2010	71.18	80369.21	0.09
Mean	105.14	37061.00	0.49
Growth Rate (%)	-68.40	512.26	-94.84
Annual Growth Rate (%)	-6.84	51.23	-9.48

Source: Annual reports of PFCL from 2000-2001 to 2009-2010(pg.no.58, 59)

The above indicated table no.6 shows the relation between fixed assets and long term funds of the concern. During the period of study the highest ratio of 1.72 was in the year 2000-2001 and the least of 0.79 in the year 2009-2010. The fixed asset ratio showed a high negative annual growth trend of -94.84% during the period of study. The fixed assets ratio had a negative annual growth rate of -6.84% and the long term fund had a high positive growth rate of 51.23%. The ratio showed an average of 0.49.

CAPITAL GEARING RATIO

This ratio is mainly to analyze the capital structure of the company capital gearing refers to the proportion between fixed interest and dividend bearing funds and non-fixed interest and dividend bearing funds in the total capital employed in the business. It aids in regulating a balanced capital structure in a company. If the value is more than 1 it is highly geared, less than 1 low geared and equal to 1 even geared. It can be calculated as follows:

$$= \frac{\text{Equity share capital}}{\text{Fixed interest or dividend bearing funds}}$$

TABLE 7: STATEMENT OF EQUITY SHARE CAPITAL TO FIXED INTEREST OR DIVIDEND BEARING FUNDS (RS IN CRORES)

Year	Equity share capital (Rs)	Fixed interest or dividend bearing funds (Rs)	Capital Gearing Ratio (Times)
2000 – 2001	3809.59	9317.14	0.41
2001 – 2002	4398.08	10981.81	0.40
2002 – 2003	5332.02	14364.10	0.37
2003 – 2004	6575.76	17748.03	0.37
2004 – 2005	6380.16	21648.24	0.29
2005 – 2006	6938.16	26924.82	0.26
2006 – 2007	8593.09	33584.18	0.26
2007 – 2008	9329.85	40647.81	0.23
2008 – 2009	11507.80	52160.15	0.22
2009-2010	13260.80	67108.41	0.20
Mean	7612.53	29448.47	0.30
Growth Rate (%)	248.09	620.27	-51.67
Annual Growth Rate (%)	24.81	62.03	-5.17

Source: Annual reports of PFCL from 2000-2001 to 2009-2010(pg.no.58, 59)

The above indicated table No. 7 shows the relation between equity share capital and fixed interest or dividend bearing funds. The highest ratio of 0.41 was in the year 2000-2001 and the least of 0.20 in the year 2009-2010. The ratio showed a consistency of 0.37 in the year 2003 and 2004 and of 0.26 in the year 2006-2007. The last five years of study the ratio showed a decreasing trend with an average of 0.30. The fixed interest of dividend bearing fund had a higher annual growth rate of 62.03% as compared to equity share capital with 24.81%. The capital gearing ratio had a negative annual growth rate of -5.17%.

DEBT SERVICE COVERAGE RATIO

This ratio relates fixed interest charges to the income earned by the business. It is also known as interest coverage ratio. It indicates whether the business has earned sufficient profits to pay periodically the interest charges. It is very important in the lenders point of view. It is calculated as follows:-

$$= \frac{\text{Net Profit before Interest \& Tax}}{\text{Fixed Interest Charges}}$$

TABLE 8: STATEMENT OF NET PROFIT BEFORE INTEREST & TAX TO CURRENT LIABILITIES (RS IN CRORES)

Year	Net Profit before Interest & Tax (Rs)	Fixed Interest Charges (Rs)	Debt Service Coverage Ratio (Times)
2000 – 2001	1816.80	1044.87	1.74
2001 – 2002	2012.59	1049.44	1.92
2002 – 2003	2527.57	1159.62	2.18
2003 – 2004	3570.65	1455.72	2.45
2004 – 2005	2973.79	1556.46	1.91
2005 – 2006	3082.72	1817.89	1.70
2006 – 2007	3866.21	2354.68	1.64
2007 – 2008	4958.39	3170.70	1.56
2008 – 2009	7925.72	4432.92	1.79
2009-2010	6223.39	4912.24	1.27
Mean	3895.78	2295.45	1.82
Growth Rate (%)	242.55	370.13	-27.14
Annual Growth Rate (%)	24.25	37.01	-2.71

Source: Annual reports of PFCL from 2000-2001 to 2009-2010 (pg.no.58, 59)

The above indicated table no. 8 shows the relation between net profit before interest and tax to fixed interest charges. The debt service coverage ratio had a negative annual growth rate of -2.71%. The highest ratio of 2.45 was observed in the year 2003-2004 and the least of 1.56 in the year 2007-2008. During the first 4 years of study the ratio showed an increasing trend and the remaining years showed a decreasing trend. The annual growth rate of fixed interest charges was 31.01% as compared to 24.25% of net profit before interest and tax. The debt service ratio showed a decreasing trend with an average of 1.82.

STANDARD DEVIATION, CO-VARIANCE AND ARITHMETIC MEAN

Arithmetic Mean (A.M) is one of the most popular and widely used measure of representing the entire data by one value i.e. average.

Standard deviation (S.D) is a popular measure of dispersion. The Standard Deviation measures the absolute dispersion or variability of distribution. A small standard deviation means higher uniformity among the observation.

Coefficient of Variation (C.V.) is the relative measure of dispersion. Coefficient of variation is used when the variability of two or more series has to be compared. A high value of coefficient of variation indicates high variability and vice-verse.

TABLE 9: STATEMENT OF ARITHMETIC MEAN, STANDARD DEVIATION AND CO-VARIANCE

Ratios	Arithmetic Mean	Standard Deviation	Co-Variance (%)
Current	1.27	0.35	27.58
Absolute liquidity	0.32	0.22	66.69
Debt-Equity	3.55	0.94	26.49
Solvency	14.06	3.16	22.47
Proprietary	3.96	1.15	29.04
Fixed Assets	0.49	0.55	112.86
Capital gearing	0.30	0.08	26.58
Debt service coverage	1.82	0.33	18.12

The table no.9 shows the Arithmetic Mean, Standard Deviation and Co-variance of solvency ratios. The highest arithmetic mean of 14.06 was shown by Solvency ratio and the least of 0.30 by Capital Gearing ratio. The highest standard deviation of 1.15 was shown by Proprietary ratio and the least of 0.08 by Capital Gearing ratio. The highest co-variance of 112.86% was shown by Fixed Assets ratio and the least of 18.17% by Debt Service Coverage ratio.

CORRELATION(R) AND STUDENT T-TEST

Coefficient of Correlation (r) is a mathematical method of measuring correlation. It gives the degree of relation ship between two variables. The values of "r" lies between + 1 and – 1. When r = 1, means perfect positive correlations, r = - 1 means perfect negative correlation, r = 0 means no relationship between the variables.

Student t – Distribution is a small test used for testing of hypotheses of sample size less than 30. If the calculated value of t is less than the table value. The null hypotheses will be accepted and vice-verse for a given significance level. It can be calculated as follow:

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

r = Coefficient of Correlation

n = No. Observation

TABLE 10: **SIGNIFICANCE OF CO-EFFICIENT OF CORRELATION 'r' AND STUDENT'S T TEST**

Particular	Current Assets to Current Liabilities	Debt to Equity
Correlation	0.96	0.99
Calculated value of t	9.7	28.12
Table Value of t	3.35	3.35
Significant	NO	NO
Level	1%	1%

The Table No. 10 indicates the Correlation and student t-test value. Highest positive correlation of 0.99 was shown between Debt and Equity and least positive correlation of 0.96 was observed between Current Assets and current liabilities. When student's t-test was applied at 1% significance level between Current Assets and current liabilities, it was found that the calculated value of 9.7 was more than the table value of 3.35; hence the alternate hypothesis was accepted. Similarly while applying test between debt and equity the alternate hypothesis was accepted, as the calculated value of 28.12 was higher than table value of 3.35.

FINDINGS AND CONCLUSION

Following are the main conclusion of Solvency analysis of PFCL:

SHORT TERM SOLVENCY POSITION

- The Current ratio position of PFCL was not satisfactory with a mean of 1.27, as the current assets were nearer to current liabilities. The current ratio followed a decreasing tendency with an annual growth rate of -2.15%, which means the current liabilities of the company were not fully secured. The fluctuating decreasing trend was as a result of faster rate of increase of current liabilities as compared to current assets. The company should increase the amount of current assets and control current liabilities for satisfactory current ratio of 2:1.
- The Absolute liquidity position of PFCL is also not satisfactory with an average of 0.32. The ratio indicates that the company did not have enough cash to pay its short term liabilities. The ratio was fluctuating with an annual growth rate of -4.79%. The decreasing trend was due to the faster rate of increase of current liabilities as compared to the increase in cash position of the company. The company should increase the cash position and decrease the amount of current liabilities for adequate Absolute liquid ratio.

LONG TERM SOLVENCY POSITION

- The Debt-Equity ratio PFCL is not satisfactory with an high average of 3.55 and a positive annual growth rate of 10.69%. The increasing rate of long term debt as compared to equity share capital was the main reason behind the increasing level of ratio. It indicates that the company is insolvent, as the interest of outsiders is much higher than the owners. It also shows that the outsiders fund is not secured. The company should raise more equity share capital and decrease the amount of long term debt for better solvency position.
- The solvency ratio of the company is also not satisfactory with a high average of 17.96 and a positive annual growth rate of 8.29%. It indicates that the total liabilities to outsiders were double as compared to the total assets of the company. The uncontrolled increase in outsider's liabilities resulted in increase in the ratio. The company should decrease the amount of outsider's liabilities and increase the fixed assets for betterment of solvency ratio.
- The Proprietary ratio of the company was highly solvent with an average of 3.96 and an annual growth rate 0.51%. The high ratio above one shows a positive sign to the outsiders, but the last years of study showed a decreasing trend. The company should try to increase the rate of increase of shareholders funds for increasing ratio in the future.
- The Fixed Assets ratio of PFCL was above 1 for the first two years which is not satisfactory. The remaining 2002-2003 & 2004-2005 showed a favorable Fixed Assets ratio. The last six years showed a higher decreasing tendency which should be controlled for favorable long term solvency of the company.
- Capital gearing ratio of PFCL was not satisfactory with an average of 0.30 and a negative annual growth of -5.17%. The annual rate of increase of fixed interest or dividend bearing is 2.5 times the rate of increase of equity share capital. The company should improve the increase rate of equity shareholders fund as compared to fixed dividend or interest dividend bearing fund for good future solvency.
- Debt-service ratio of PFCL is also not satisfactory with an average of 1.82 and an annual growth rate of -2.71%. The ratio showed a decreasing trend, as the rate of increase of fixed interest charges (37.01%) was higher that the rate of increase of EBIT (24.25%). The company should decrease the growth rate of fixed interest charges and increase the growth rate EBIT to stabilize the long term solvency position.

STATISTICAL TECHNIQUES

- Standard deviation was highest in solvency ratio, which shows a higher degree of variability and the least of 0.08 was observed in capital gearing ratio. The highest Co-variance 112.86 was shown by fixed assets ratio, which is an indicator of lesser degree of uniformity compared to other ratios. The highest degree of uniformity among ratios was shown by debt-service coverage ratio. During the period of study it was observed that all the methods of dispersion used showed a high degree of variability.
- Highest positive correlation of 0.99 was shown between Debt and Equity and least positive correlation of 0.96 was observed between Current Assets and current liabilities. So the companies should increases current assets as well as cash position and decrease the current liability position for a favorable short term solvency. When student's t-test was applied at 1% significance level between Current Assets and current liabilities, it was found that the calculated value of 9.7 was more than the table value of 3.35; hence the alternate hypothesis was accepted. Similarly while applying test between debt and equity the alternate hypothesis was accepted, as the calculated value of 28.12 was higher than table value of 3.35. Student's t test indicates that the short term as well as long term solvency position of PFCL has significant difference during the period of study.

By the observations of this study, it is found that the short term as well as long term solvency position of the company is not satisfactory. The reason behind unsatisfactory short term solvency ratio is that, the growth rate of current assets and absolute liquid is low as compared to increase in current liabilies. The company should increase the current assets by keeping shorter and timely interest collection period. The current liabilities of the company should be decreased by timely payment to creditors, unpaid interest etc. The long term solvency position of the company is also not satisfactory due to the continuous and uncontrolled increase in long term debts as compared to the owners fund. The company should improve the long term solvency position by increasing owners funds and decreasing the secured, unsecured loans etc. The operating profit of the company also showed a lower rate of growth as compared to fixed interest charges, which indicates a negative impact on its profit earning capacity. The overall position of PFCL is not satisfactory and it gives indication of alarming that, it should improve their overall working capital stability and long term solvency position. PFCL is a PSU organization and not only PSU; it is also a Nav-Ratna company among PSU. It can improve their efficiency only by control and reducing outsider's liabilities. If the management or government does not look into it seriously, it can result in loss of jobs and the company will become a sick unit.

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