BUSINESS AND ECONOMICS RESEARCH JOURNAL

ISSN: 1309-2448

ANALYSIS OF FINANCIAL PERFORMANCE OF INDIAN COMPANIES HAVINGMAXIMUM PIOTROSKI'S F SCORE

Dr. Ravi Veeraraghavan

Professor, Xavier Institute of Management & Entrepreneurship

ABSTRACT:

Piotroski's F Score is one of tools that help in assessing financial health of a company. The financial health is stronger the higher the score. To calculate Piotroski's F-Score, nine financial measures are assessed, and the achievement of each parameter is given a point. This research focuses on Indian companies that have the maximum F score, namely 9 (hereinafter referred to as 'P-9' companies. As most of the parameters considered for the Piotroski score are related to improvement, an attempt has been made in this study to analyse the absolute performance of these companies on various financial parameters.The study reveals that out of 990 Indianlisted companies having an annual revenue of Rs. 1000 Crore or more, only 54 companies (5.5%) have a P-Score of 9. It is also found that only 11 companies in the BSE-500 have an F-Score of 9. This study shows that even though all the companies covered in the study have Piotroski's F score of 9, the absolute performance levels of most of the financial parameters widely varies. The variation is moderate in the case of Interest Cover and minimal in the case of Debt-Equity Ratio. Only 17 out of 54 (31%) companies have a Price-Earnings (PE) Ratio above the respective industry average. The study concludes that the investor may need to consider absolute performance of the company on financial parameters besides Piotroski's F Score.

Key Word: Piotroski, F Score, Financial Ratio, Altman's Z Score

Piotroski's F-Score:

Professor of Accounting Joseph Piotroski created the financial grading system known as Piotroski's F-Score. It is used to evaluate a company's financial health by allocating a score between 0 and 9. The company's financial health is stronger the higher the score. Several financial variables, including profitability, leverage, liquidity, and operating efficiency, are assessed by the F-Score. Based on preset standards, one point is given to each parameter. For instance, a business gets one point if its return on assets improves. It gains another point if its operating cash flow exceeds its net income, and so on. Piotroski's F-Score is used to distinguish between organisations with improved financial situations and those whose financials are deteriorating. Investors frequently use it as a tool to find possibly lucrative investment possibilities. Piotroski's F-Score is considered a useful tool, but it is not the only consideration when choosing an investment. Additional essential and qualitative facets of a business before making any investment decisions.

Calculation of Piotroski's F Score:

To calculate Piotroski's F-Score, nine financial measures are assessed, and the achievement of each parameter is given a point. Below is a summary of the parameters along with the associated criteria:

1. Net Income: If the company reports positive net income in the current year, it receives one point; otherwise, it receives zero points.
2. Gross Margin: If the company's gross margin (gross profit divided by sales) is higher in the current year compared to the previous year, it receives one point; otherwise, it receives zero points.
3. Return on Assets (ROA): If the company's ROA is higher in the current year compared to the previous year, it receives one point; otherwise, it receives zero points.
4. Operating Cash Flow: If the company generates positive operating cash flow in the current year, it receives one point; otherwise, it receives zero points.
5. Cash Flow from Operations: If the company's cash flow from operations is higher than net income, it receives one point; otherwise, it receives zero points.
6. Current Ratio: If the company's current ratio (current assets divided by current liabilities) is higher in the current year compared to the previous year, it receives one point; otherwise, it receives zero points.
7. Long-Term Debt: If the company's long-term debt decreases in the current year compared to the previous year, it receives one point; otherwise, it receives zero points.
8. Asset Turnover: If the company's asset turnover ratio (sales divided by average total assets) is higher in the current year compared to the previous year, it receives one point; otherwise, it receives zero points.
9. Dilution of Shares: If the company did not issue new shares in the current year, it receives one point; otherwise, it receives zero points.

The total score is then calculated by summing up the points assigned to each metric, resulting in an F-Score ranging from 0 to 9. A higher score generally indicates a stronger financial position. Piotroski's F-Score provides a single numerical value and a score of 9 is the maximum. A firm having F Score above 5, up to 4 and at 5 are classified as firms having strong financial health, weak financial health and neutral respectively.

While Piotroski's F-Score can be a useful tool for evaluating a company's financial health, it does not take into account qualitative factors such as industry trends, competitive landscape, or management quality. It is based on historical data and it does not consider industry variations. It may be noted that most of the parameters listed above relate to improvement over the previous year.

Review of Literature:

Studies and research have been done on Piotroski's F-Score's efficacy and validity concerning the financial performance of companies in various countries.

Noma (2010) tested Piotroski's investment strategy in Japan for the period 1986 to 2001 and found that a hedged portfolio with high F-score on high book-to-market firms produces 17.6 % annual returns. a stock with higher F-score, on average, generates a higher return than a stock with lower F-score. Charles Hyde (2013) analysed emerging market and found there is a meaningful premium attached to high F score stocks which is unrelated to the size, value and momentum premiums.

J Singh and Kaur (2015) examined the performance of the F-score strategy to separate winners from losers in the Indian stock market.

Staffan Bülow (2017) tested the US market for the period 2003-2015 and found that a portfolio with a high F-score earns a one-year market-adjusted return of 18.3 % annually. The corresponding return for a low-score portfolio is 4 % annually. Krauss Christopher (2015) analysed Piotroski's F-score strategy in the U.S. stock universe from an investor's perspective and reconfirmed the high returns of this fundamental value strategy.Eremenko, Egor (2017) found that companies with high F-Score in non-US markets generate 8.2% (long position, absolute value, in average) above the corresponding market index performance, and the average P&L is 20.2%. The companies with low F-Score show very poor performance losing -25.3% (short position, absolute value, on average) less the corresponding market index, and average P&L is -12.7%.Deng, X. (2016) measured risk in terms of beta and volatility and foundhigh F-Score firms are less risky than low F-Score firms in the Chinese-A share market.

Studies have also been done on the F-Score's suitability for the Indian stock market, as well as its capacity to recognize financially sound businesses and forecast stock returns in the future. Rangapriya, S., & Meenakumari, J. (2021) investigated the efficacy of the Piotroski F-score to screen firms with good financial health and to identify early signs of financial distress in Indian banking stocks. A study conducted by Trilochan Tripathy1 & Bijon Pani (2017) concluded that high book-to-market firms with high F scores can shift the distribution of contemporaneous and future stock performances in favour of investors in the Indian market. Sri Ayan Chakraborty (2018) analysed F Scores for companies in the Cement Sector of India.

Research done by Agrawal (2015) shows that the Piotroski's F-score is found to be statistically significant in predicting defaults. Higher values of the score are associated with lower probability of default. Among the individual components of the score, change in leverage is found to be statistically significant in predicting defaults.

This research focuses on Indian companies that have the maximum F score, namely 9 (hereinafter referred to as 'P-9'companies. As most of the parameters considered for the Piotroski score are related to improvement, an attempt is made in this study to analyse the absolute performance of these companies on various financial parameters.

Scope of the study:

First, a study of Nifty and BSE companies was done to check how many companies have the maximum F Score by considering data as of January 2024. Analysis of NSE-50companiesreveals only one out of 50 companies has a Piotroski's F Score of 9. It is also found that only 11 companies in the BSE-500 have an F-Score of 9. Astudy of active companies in the stock market was done to check the number of companies having a P-Score of 9. Out of 4217 active companies in January 2024 only 165 companies (3.4%). have a P-score of 9. It is also found that out of 990 companies having an annual revenue of Rs. 1000 Crore or more, only 54 companies (5.5%) have a P-Score of 9. A deeper analysis was done on the 54 companies that have an annual revenue of Rs. 1000 Crore and above witha Piotroski Score of 9 and the key findings are given in this research paper. The P-9 companies have been categorised as Very Large, Large, Medium and Small. Very small companies not considered for deeper analysis. Financial data published by the respective companies and stock market data as of 15th January 2024 have been considered for analysis.

Analysis and findings:

Table 1: Analysis of P-9 companies by Size:

Company Revenue	Category	No. of companies	Annual Revenue	No of companies %	Annual Revenue %
Above 10000 Cr	Very Large	10	353387	6%	69%
5000 to 10000	Large	6	37504	4%	7%
2500 to 5000	Medium	15	53795	9%	11%
1000 to 2500	Small	23	38690	14%	8%
1000 and above – Sub-total		**54**	**483376**	**33%**	**95%**
Less than 1000	Very Small	111	27708	67%	5%
Total		**165**	**511084**	**100%**	**100%**

Out of 165 P-9 companies, only 54 (32% of the P-9 companies) have a revenue of more than Rs. 1000 Crore of annual revenue. It is observed that 33% of P-9 companies contribute 95% of the annual revenue. Further analysis of financial parameters has been done for the 54 companies which constitute 95% of total revenue.

Table 2: Sales Growth:

Sales Growth %	No. of companies	Negative	0%-10%	10%-20%	Above 20%
Very Large	10	2	2	4	2
Large	6		1	3	2
Medium	15	2	6	5	2
Small	23	4	5	7	7
Total	**54**	8	14	19	13

The above Table shows that there is a variation in sales growth performance among the P-9 companies. Only 32 out of 54 companies (59%) have shown a sales growth of 10% of more from the previous year. 70% of Large & Very Large companies have shown a growth of 10% of more.

Table 3: Price Earnings Ratio:

Price Earnings multiplier for the 54 companies was analysed and a comparison with the Median Price Earnings multiplier for the industry.

PE Ratio	No. of companies	Below 10	10 - 20	20-30	Above 30	PE>Ind PE
Very Large	10	3	4	1	2	2
Large	6	2	1	2	1	2
Medium	15	7	3	0	5	6
Small	23	14	1	3	5	7
Total	**54**	**26**	**9**	**6**	**13**	**17**

The above Table shows that there is a variation in the Price-Earnings multiplier among the P-9 companies.

Only 17 out of 54 (31%) companies have a Price-Earnings (PE) Ratio above the respective industry average. Only 20% (2 out of 10) of the large companies have a PE Ratio above the respective industry average.

48% (26 out of 54) of the P9 companies have a PE ratio of less than 10. Only 24% of the P9 companies have a PE ratio above 30. The Median PE of all companies with a revenue of Rs.1000 Crore & above is around 30.

Table 4: Operating Margin:

Operating Margin	No. of companies	0 -10%	10%-20%	20-30%	Above 30%
Very Large	10	3	3	3	1
Large	6	2	1	2	1
Medium	15	5	5	3	2
Small	23	9	9	3	2
Total	**54**	**19**	**18**	**11**	**6**

It is observed that there is a variation in the Operating Margin % among the P-9 companies. 35% of (19 out of 54) P9 companies earn an operating margin of 10% or less. 11% of the P9 companies earn an operating margin of 30%.

Table 5: Return on Assets:

Return on Assets	No. of companies	0 -5%	5%-10%	10-20%	Above 20%
Very Large	10	3	2	4	1
Large	6	2		4	
Medium	15	3	6	4	2
Small	23	10	6	6	1
Total	**54**	**18**	**14**	**18**	**4**

It is noticed that there is a variation in the Return on Assets among the P-9 companies.

1/3 of the P-9 companies earn a return of less than 5% on Assets. 52% (32 out of 54) of the P-9 companies achieve a return of 10% or less.

Table 6: Current Ratio:

Current Ratio	No. of companies	Below 1	1-2	2-4	Above 4
Very Large	10	1	8	1	0
Large	6		3	2	1
Medium	15	1	7	6	1
Small	23	5	13	4	1
Total	**54**	**7**	**31**	**13**	**3**

Variation in the Current Ratio among P-9 companies is noticed in the above Table. A current ratio of 2 or more is considered safe. 70% of the P-9 companies have a current ratio of less than 2. 13% of the P9 companies have a current ratio of below 1.

Table 7: Interest Coverage:

Interest Coverage	No. of companies	Below 2	2 - 4	4 - 8	Above 8
Very Large	10		1	4	5
Large	6			3	3
Medium	15	1	2	4	8
Small	23			2	21
Total	**54**	**1**	**3**	**13**	**37**

93% of the companies have a healthy interest coverage of 4 and above. 69% of the P-9 companies have an interest coverage of 8 and above.

Table 8: Altman Z Score:

Altman Z Score	No. of companies	< 1.81	1.81 -2.99	>2.99
Very Large	10		3	7
Large	6		3	3
Medium	15		4	11
Small	23	2	2	19
Total	**54**	**2**	**12**	**40**

Variation is noticed among the P-9 companies concerning Altman's Z Score, which indicates the financial solvency of a company. 26% (14 out of 54) of the P9 Companies are below the safe zone. Only 74% of the P-9 companies are in the Safe zone. Two small companies are below 1.81, which means that these companies are closer to bankruptcy.

Table 9: Liquid Ratio:

Liquid Ratio	No. of companies	<0.5	0.5 - 1	1-2	Above 2
Very Large	10	3	4	3	0
Large	6		1	2	3
Medium	15	3	2	7	3
Small	23	3	6	11	3
Total	**54**	**9**	**13**	**23**	**9**

Variation in the Liquid Ratio among P-9 companies is observed. A liquid ratio of 1 or more is considered good. 41% of the P-9 companies (22 of the 52) have a liquid ratio of less than 1.

Table 10: Working Capital days:

Working Capital Days	No. of companies	Below 30	30 - 90	90 - 180	> 180
Very Large	10	5	3	2	
Large	6	2	2	2	
Medium	15	7	4	3	1
Small	23	10	7	4	2
Total	**54**	**24**	**16**	**11**	**3**

The above Table shows the variation in the working capital days between the P-9 companies.

44% of the companies have a working capital of 30 days or below. 26% of the companies (14 of 53) companies have a working capital of 90 days and above.

Table 11: Debt Equity:

Debt-to-equity (D/E) ratio is used to evaluate a company's financial leverage and is calculated by dividing a company's total liabilities by its shareholder equity.

Debt Equity	No. of companies	<0.5	0. 5 - 1	1 -2	Above 2
Very Large	10	6	3	1	
Large	6	5	1		
Medium	15	14	1		
Small	23	12	5	5	1
Total	**54**	**37**	**10**	**6**	**1**

Almost all the companies (98%) have a low Debt Equity Ratio.

Table 12: Return on Investment over 6 months:

6-month Return	No. of companies	Negative	0-10%	10%-20%	20% - 40%	Above 40%
Very Large	10			2	1	7
Large	6	1			4	1
Medium	15	3	1	3	2	6
Small	23		4	4	8	7
Total	**54**	**4**	**5**	**9**	**15**	**21**

The above Table shows that there is a variation in the Return on Investments among the P-9 companies.

1/3 of the P-9 companies have given a return of 20% or less. Median 6-month Return for the companies having revenue of Rs. 100 crores are around 24.

Conclusion:

This study shows that even though the companies have Piotroski's F score of 9, the absolute performance on the following financial parameters widely varies: (1) Annual Revenue (2) Sales Growth (3) Price-Earnings Ratio (4) Operating Margin (5) Return on Assets (6) Current Ratio (7) Altman's Z Score (8) Liquid Ratio (9) Working Capital Days and (10) Return on Investments. The variation is moderate in the case of Interest Cover and minimal in the case of Debt-Equity Ratio.Only 17 out of 54 (31%) companies have a Price-Earnings (PE) Ratio above the respective industry average. The study concludes that the investor may need to consider absolute performance against financial parameters besides Piotroski's F Score.

Limitation:

This study covers the listed, active Companies that have an annual revenue of Rs. 1000 crores or more and have a maximum Piotroski's score of 9. The study covers company data for one year only. The market data pertains to January 2024. The results may vary from time to time based on Market conditions, industry dynamics, and company-specific factors that can influence the effectiveness of any financial scoring system.

References:

1. Piotroski, J. D. (2000). Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers. Journal of Accounting Research, 38, 1–41.https://doi.org/10.2307/2672906

2. Hyde, Charles E., An Emerging Markets Analysis of the Piotroski F Score (March 28, 2013). Available at SSRN: https://ssrn.com/abstract=2274516 or http://dx.doi.org/10.2139/ssrn.2274516

3. Singh, J. and Kaur, K. (2015), "Adding value to value stocks in Indian stock market: an empirical analysis", *International Journal of Law and Management*, Vol. 57 No. 6, pp. 621-636. https://doi.org/10.1108/IJLMA-09-2014-0055

4. Krauss, Christopher; Krüger, Tom; Beerstecher, Daniel (2015): The Piotroski F-Score: A fundamental value strategy revisited from an investor's perspective, IWQW Discussion Papers, No. 13/2015, Friedrich-Alexander-Universität Erlangen-Nürnberg, Institut für Wirtschaftspolitik und Quantitative Wirtschaftsforschung (IWQW), Nürnberg

5. Deng, X. (2016). Piotroski's F-Score in the Chinese A-Share market. (Thesis). University of Cape Town,Faculty of Commerce,Department of Finance and Tax. Retrieved from http://hdl.handle.net/11427/24520

6.Rangapriya, S., & Meenakumari, J. (2021). Using Piotroski F-Score for Assessing Financial Health: Evidence from Leading Indian Private Banks. *Management Science, 8*, 117-132.

7. Trilochan Tripathy & Bijon Pani (2017) Effect of F Score on Stock Performance: Evidence from Indian Equity Market, International Journal of Economics and Finance; Vol. 9, No. 2; 2017 ISSN 1916-971X E-ISSN 1916-9728 Published by Canadian Center of Science and Education

8.Eremenko, Egor, Quantitative Fundamentals. Application of Piotroski F-Score on Non-U.S. Markets. (April 9, 2017). Available at:
SSRN: https://ssrn.com/abstract=3262154 or http://dx.doi.org/10.2139/ssrn.3262154

9. Sri Ayan Chakraborty, Impact of Piotroski Score On P/E Ratio: A Study on Indian Cement Sector, Asia Pacific Journal of Research, Vol: I. Issue XCV (Pages 59-82), December 2018, ISSN (Print): 2320-5504 ISSN (Online): 2347-4793

10. Agrawal, K. (2015). Default Prediction Using Piotroski's F-score. Global Business Review, 16(5_suppl), 175S-186S. https://doi.org/10.1177/0972150915601261