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# Impact of Bankruptcy on Firms Performance

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## Abstract

*Bankruptcy represents a critical event in the lifecycle of a firm, profoundly affecting its operational, financial, and strategic dimensions. This study aims to provide a comprehensive analysis of the impact of bankruptcy on firm performance, exploring various facets of its implications on both short-term and long-term operational effectiveness, financial health, and market position. The research adopts a mixed-method approach, integrating quantitative analysis of financial data with qualitative insights from case studies and expert interviews. Firstly, the study examines the immediate consequences of bankruptcy, such as disruptions in operations, loss of market trust, and creditor actions. It investigates how these factors contribute to declines in revenue, profitability, and market share in the short term, often leading to asset liquidation and restructuring efforts. Moreover, the research delves into the long-term repercussions of bankruptcy, including the enduring effects on organizational reputation, employee morale, and stakeholder relationships. It investigates the challenges faced by firms in regaining market credibility, attracting investment, and rebuilding their competitive advantage post-bankruptcy. Furthermore, the study analyses the role of management strategies, such as turnaround initiatives and reorganization efforts, in mitigating the negative impacts and facilitating recovery. Additionally, the research explores the sector-specific dynamics of bankruptcy effects, considering variations in industry regulations, market competition, and technological disruptions. It investigates how factors such as industry concentration, market demand elasticity, and technological obsolescence influence the severity and duration of performance decline following bankruptcy. Overall, the findings of this study contribute to a deeper understanding of the multifaceted implications of bankruptcy on firm performance, offering insights for managers, policymakers, and investors in navigating the challenges associated with financial distress and facilitating sustainable recovery strategies.*

***Keywords:*** *Bankruptcy; Operational Effectiveness; Financial Health; Financial Distress.*

## 1. Introduction

Bankruptcy, a state of financial insolvency, poses significant risks to companies like Chemipack India Pvt. Ltd. It can result from poor management, inadequate financial planning, operational inefficiencies, economic downturns, market shifts, and regulatory changes. The impacts extend beyond finances, affecting market standing, supplier and customer relationships, employee livelihoods, and the broader economy. Regulatory bodies like the Reserve Bank of India (RBI) oversee the financial sector, implementing measures to mitigate systemic risks. Banks also work to prevent bankruptcy through credit assessments, monitoring financial health, and offering financial support. They may restructure debts or provide temporary relief to help distressed companies recover. Companies must proactively avoid insolvency by prioritizing financial prudence, operational efficiency, and strategic planning. This includes optimizing production, diversifying products, expanding markets, and investing in innovation. Leveraging technology and data analytics can enhance decision-making and risk management. Bankruptcy prediction is crucial in economic decision-making, impacting local communities, stakeholders, investors, policymakers, and the global economy. Researchers use data-intensive models to predict business distress, drawing on historical data and financial indicators. Despite challenges like data imbalance, modern techniques such as neural networks and structural models improve predictive accuracy. Overall, understanding and predicting

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Page No: 1819-1827

bankruptcy help stakeholders make informed decisions and mitigate risks, fostering long-term business resilience and competitiveness.

### 1.1. Problem Statement

The problem addressed in this study is the need to understand the factors contributing to bankruptcy among manufacturing firms, with a specific focus on Champak India Pvt. Ltd. Despite its significance, there is a gap in the literature regarding the specific challenges and opportunities faced by manufacturing companies in avoiding bankruptcy and maintaining financial stability [5].

### 1.2. Objectives of the Study

- To understand the application of Altman's Z-Score model [1].
- To analyse efficiency of financial ratios [2].
- To evaluate overall performance of the company using Altman Z-score model [3].
- To forecast the distress levels of the company [4].

## 2. Method

The study is exploratory in nature. Secondary data is considered for analyzing the data. A sample of 5 companies from 5 different sectors has taken for the study to assess financial distress levels. Altman's Z-score model, trend graphs ratio analysis used for the analysis in table 1&2.

## 3. Results and Discussion

### 3.1. Results

How to Calculate the Altman Z-Score in Table 3.
One can calculate the Altman Z-score as follows:
Altman Z-Score = 1.2A + 1.4B + 3.3C+ 0.6D+ 1.0E
Where:
A = working capital / total assets
B = retained earnings / total assets
C = earnings before interest and tax / total assets
D = market value of equity / total liabilities
E = sales / total assets

**Table 1 Ranges of Manufacturing Companies**

| | |
|---|---|
| Z-Score < 1.81 | Distress Zone |
| 1.81< Z-Score< 2.99 | Grey Zone |
| Z-Score > 2.99 | Safe Zone |

**Table 2 Non-Manufacturing Companies**

| | |
|---|---|
| Z-Score < 1.1 | Distress Zone |
| 1.81< Z-Score< 2.6 | Grey Zone |
| Z-Score > 2.6 | Safe Zone |

**Table 3 Ratio of Working Capital to Total Assets (In Percentage)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | Average |
|---|---|---|---|---|---|---|
| **INFOSYS** | 12.28 | 21.63 | 7.57 | 11.45 | 7.606 | 12.11 |
| **AUROBINDO** | 24.8 | -27.3 | 16.6 | 19.81 | 29.95 | 12.78 |
| **HDFC** | 28.91 | 20.44 | 7.63 | 8.912 | 25.43 | 18.26 |
| **MAHINDRA** | -19.4 | -17.9 | -22 | -152 | -16.4 | -45.51 |
| **CHEMIPACK** | 24.19 | 28.98 | 26.8 | 14.15 | 10.06 | 20.84 |

**Source: Data is Taken from Balance Sheets of 5 Companies**

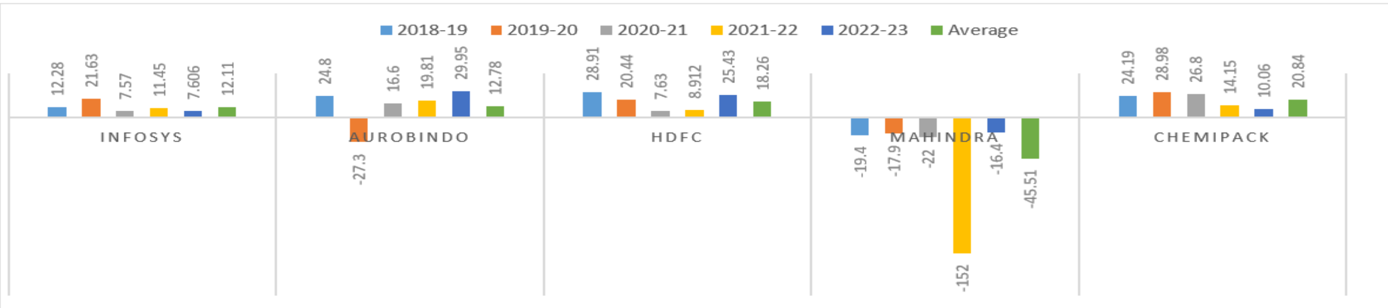


**Figure 1 Ratio of Working Capital to Total Assets (In Percentage)**
**Source: in the Above Graph Data is Taken from Balance Sheets of 5 Companies**

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Volume: 02
Issue: 06 June 2024
Page No: 1819-1827

The table shows the Working Capital to Total Assets ratio for five companies over five years. Infosys and HDFC maintain relatively stable ratios, indicating sound financial management. Aurobindo's ratio fluctuates, sometimes showing liquidity concerns. Mahindra faces severe challenges with highly fluctuating and often negative ratios, suggesting liquidity issues. Chemipack maintains moderate stability despite minor fluctuations. Overall, while some companies manage their working capital well, others face significant challenges, impacting their financial health in Figure 1.

**Table 4 Ratio of Retained Earnings to Total Assets (In Percentage)**

| | **2018-19** | **2019-20** | **2020-21** | **2021-22** | **2022-23** | **Average** |
|---|---|---|---|---|---|---|
| **INFOSYS** | 25.4 | 30.78 | 31.3 | 32.62 | 33.03 | 30.62 |
| **AUROBINDO** | 21.65 | 25.74 | 29.7 | 32.22 | 38.66 | 29.59 |
| **HDFC** | 58.06 | 56.97 | 57.1 | 55.64 | 60.59 | 57.66 |
| **MAHINDRA** | 20.73 | 1.898 | 1.65 | 31.16 | 3.248 | 11.74 |
| **CHEMIPACK** | 48.19 | 52.1 | 54.4 | 40.33 | 27.31 | 44.45 |

**Source: The Above Data is Taken from Balance Sheets of 5 Companies**

A weak X1 means a weak X2 ratio and vice versa: Mahindra has both negative working capital to total assets ratio and retained earnings to total assets ratio, while companies with better working capital to total assets ratio have higher earnings to total assets ratio. Poor working capital would not enable a firm to finance its expansion, modernization, and other activities. This pushes a firm to use only external funds Table 4& Figure 2. The details relating to EBIT and Total assets are given in Table 3It is a measure of asset profitability or overall return on capital employed. A positive higher and increasing ratio would indicate a stronger asset utilization in Table 5& Figure 3.

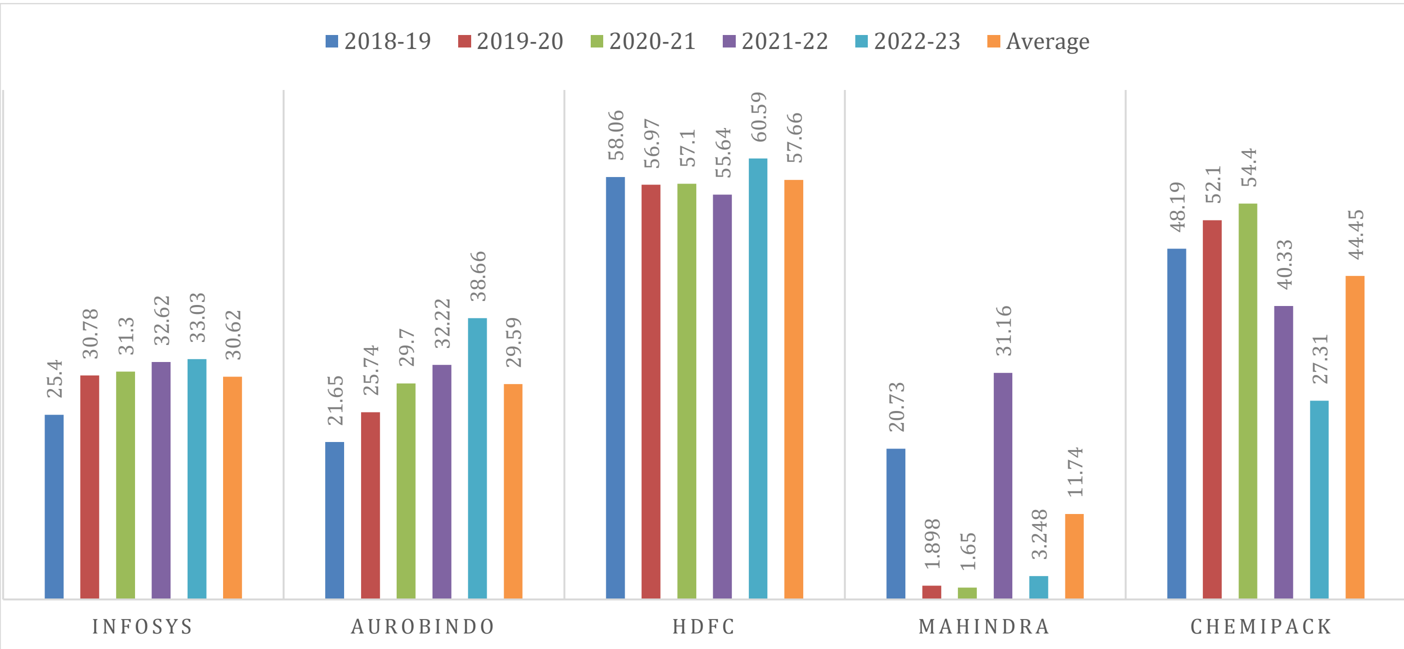


**Figure 2 Ratio of Retained Earnings to Total Assets (In Percentage)**
**Source: The Above Graph is Data Taken from Balance Sheets of 5 Companies**

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Page No: 1819-1827

**Table 5 Ratio of Earnings Before Interest to Total Assets (In Percentage)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | Average |
|---|---|---|---|---|---|---|
| **INFOSYS** | 12.78 | 12.81 | 10.3 | 8.995 | 8.011 | 10.59 |
| **AUROBINDO** | 23.46 | 22.51 | 21.5 | 23.13 | 21.58 | 22.43 |
| **HDFC** | 24.65 | 23.61 | 24.1 | 25.26 | 18.61 | 23.25 |
| **MAHINDRA** | 6.163 | 4.327 | 2.51 | 25.82 | 4.665 | 8.696 |
| **CHEMIPACK** | 31.86 | 29.41 | 28.5 | 24.44 | 32.71 | 29.38 |

**Source: The Above Data is from the Balance Sheets**

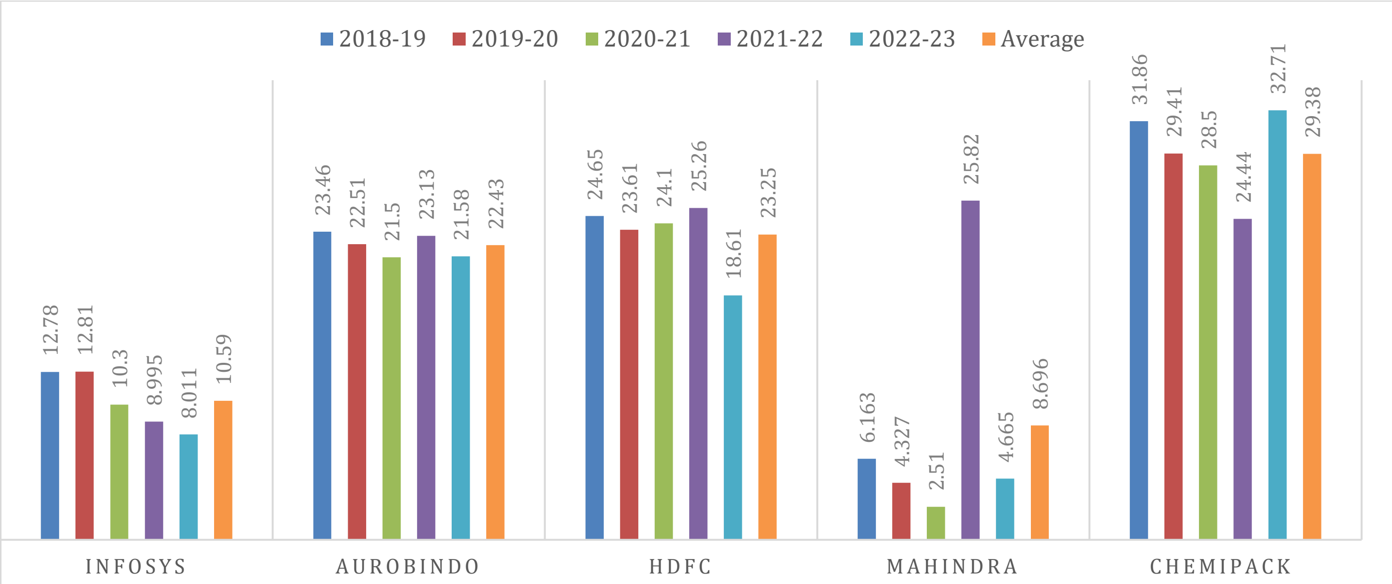


**Figure 3 Ratio of Earnings Before Interest to Total Assets (In Percentage)**
**Source: The Above Graph Has Data Taken from The Balance Sheet of Companies**

The table depicts the Ratio of Earnings Before Interest to Total Assets for five companies across five years. Infosys maintains a relatively stable performance, averaging 10.59%, while Aurobindo and HDFC also exhibit consistent earnings generation, averaging 22.43% and 23.25%, respectively. Mahindra's ratio fluctuates significantly, averaging 8.696%, with a notable increase in 2021-22. Chemipack consistently performs well, averaging 29.38%. Overall, while some companies show consistent earnings generation, others display more volatility, highlighting varied financial performances across the board in Table 6& Figure 4.

**Table 6 Ratio of Market Value of Equity to Total Liabilities (In Percentage)**

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | Average |
|---|---|---|---|---|---|---|
| **INFOSYS** | 271.1 | 280.4 | 248.47 | 143.2 | 33.66 | 195.4 |
| **AUROBINDO** | 2137 | 2130 | 2484.9 | 2844 | 3409 | 2601 |
| **HDFC** | 2148 | 1684 | 1525.6 | 1201 | 1678 | 1647 |
| **MAHINDRA** | 80.84 | 18.68 | 14.245 | 23.55 | 34.98 | 34.46 |
| **CHEMIPACK** | 1436 | 1687 | 3804.2 | 1900 | 1973 | 2160 |

**Source: The Above Data is Been Taken from The Balance Sheet of 5 Companies**

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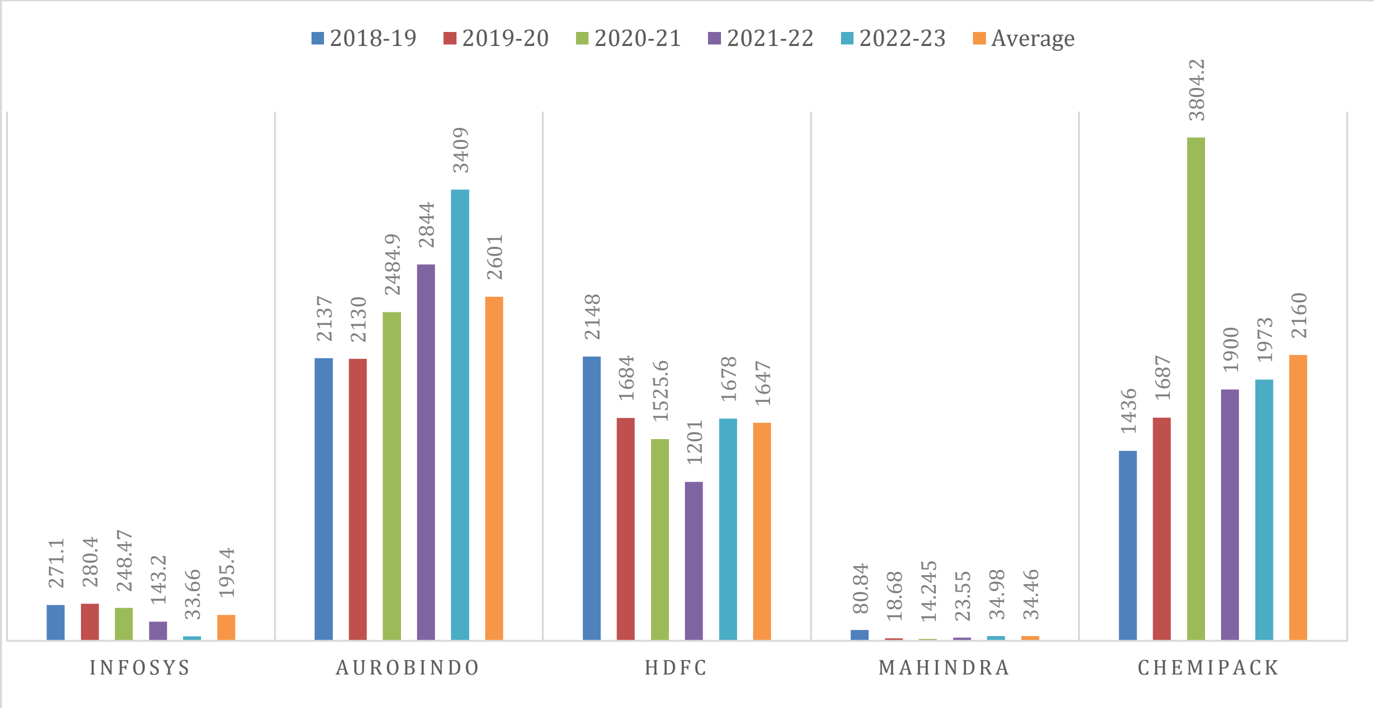


**Figure 4** Ratio of Market Value of Equity to Total Liabilities (In Percentage)
**Source: In The Above Graph Data is Taken from The Balance Sheet of 5 Companies**

The table displays the Ratio of Market Value of Equity to Total Liabilities for five companies across five years. Infosys averages 195.4%, indicating a strong market value of equity relative to liabilities, albeit with a notable decrease in 2021-22. Aurobindo's ratio averages 2601%, reflecting a substantial market valuation compared to liabilities, with consistent growth. HDFC's ratio averages 1647%, indicating a strong equity position relative to liabilities, despite fluctuations. Mahindra's ratio averages 34.46%, showing a relatively lower market valuation compared to liabilities. Chemipack's ratio averages 2160%, indicating a robust market value of equity relative to liabilities, with significant variation over the years. Overall, the analysis reveals varying levels of market valuation relative to liabilities among the companies, reflecting diverse financial positions and market perceptions in table 7& Figure 5.

**Table 7** Ratio of Sales to Total Assets (In Times)

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | Average |
|---|---|---|---|---|---|---|
| **INFOSYS** | 0.19363 | 0.231364 | 0.190721 | 0.182635 | 0.165068 | 0.192684 |
| **AUROBINDO** | 1.212543 | 1.207621 | 1.224777 | 1.24191 | 1.055641 | 1.188498 |
| **HDFC** | 1.005962 | 0.982471 | 1.028031 | 1.100359 | 0.81056 | 0.985477 |
| **MAHINDRA** | 0.409268 | 0.333974 | 0.293535 | 2.376496 | 0.290774 | 0.74081 |
| **CHEMIPACK** | 2.203563 | 1.894694 | 1.758055 | 1.459278 | 1.608615 | 1.784841 |

**Source: The Above Data is Taken from Balance Sheets of 5 Companies**

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Volume: 02
Issue: 06 June 2024
Page No: 1819-1827

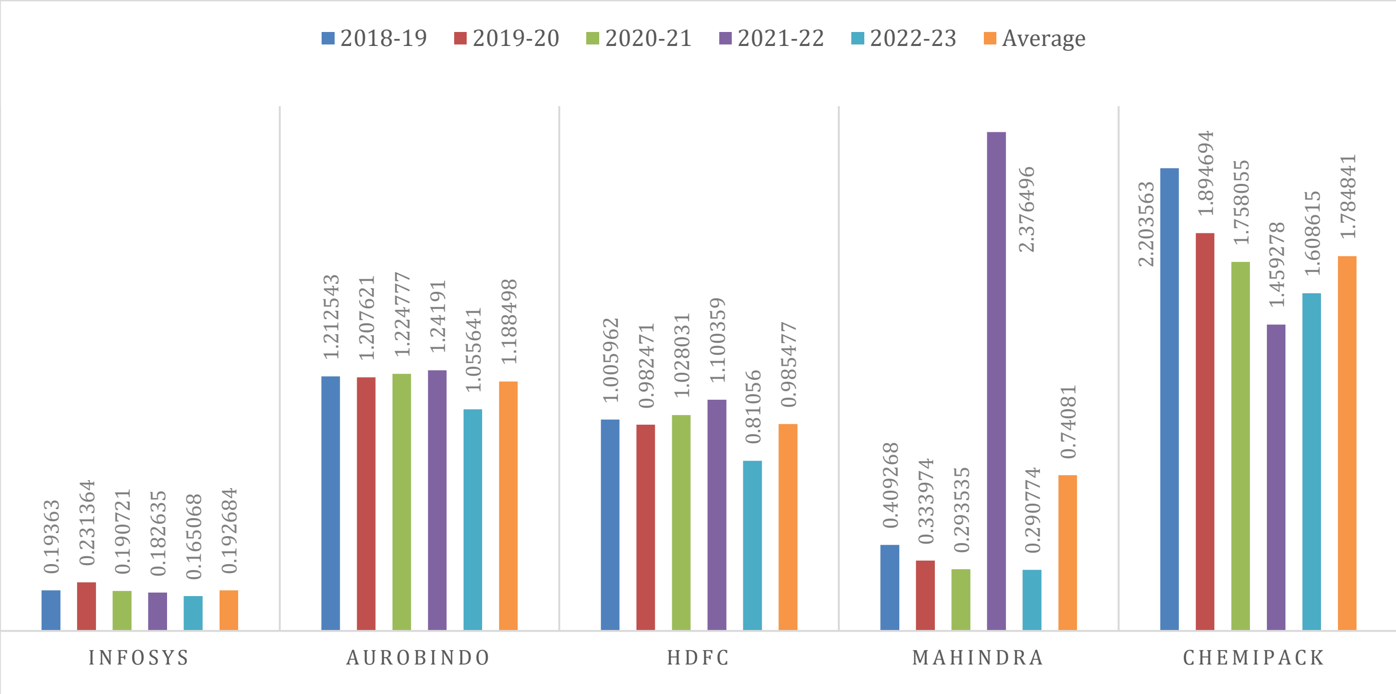


**Figure 5 Ratio of Sales to Total Assets (In Times)**
**Source: The Above Graph Has Data Taken from The Balance Sheet of Companies**

The table presents the Ratio of Sales to Total Assets for five companies over five years. Infosys averages 0.192684, indicating that sales are approximately 19.27% of total assets, showing consistency with minor fluctuations. Aurobindo's ratio averages 1.188498, suggesting that sales are approximately 118.85% of total assets, reflecting consistent performance. HDFC's ratio averages 0.985477, indicating that sales are approximately 98.55% of total assets, with minor variation Mahindra's ratio averages 0.74081, indicating that sales are approximately 74.08% of total assets, with a notable increase in 2021-22. Chemipack's ratio averages 1.784841, indicating that sales are approximately 178.48% of total assets, showing relatively stable performance. Overall, the analysis reveals varying levels of sales efficiency relative to total assets among the companies, reflecting diverse operational efficiencies and market positions in table [8-9].

**Table 8 Altman's z-score**

| Company Name | 2019 | 2020 | 2021 | 2022 | 2023 | Mean | CV |
|---|---|---|---|---|---|---|---|
| INFOSYS | 5.3389 | 6.2135 | 4.8163 | 3.916 | 2.4628 | 4.5494 | 31.50855 |
| AUROBINDO | 15.41 | 15.294 | 17.446 | 19.74 | 23.109 | 18.201 | 18.07342 |
| HDFC | 15.864 | 12.9 | 11.846 | 10.05 | 12.64 | 12.66 | 16.65819 |
| MAHINDRA | 0.6661 | -0.6118 | -1.049 | -6.88 | -0.2819 | -1.6319 | -183.99 |
| CHEMIPACK | 12.833 | 14.045 | 26.587 | 14.38 | 15.015 | 16.573 | 34.11649 |

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e ISSN: 2584-2854
Volume: 02
Issue: 06 June 2024
Page No: 1819-1827

**Table 9 Financial Health of Family-Controlled Companies**

| Company Name | Average | Financial Health |
|---|---|---|
| **INFOSYS** | 4.94419 | Safe |
| **AUROBINDO** | 16.80524 | Safe |
| **HDFC** | 14.26217 | Safe |
| **MAHINDRA** | -0.48289 | Bankruptcy |
| **CHEMIPACK** | 14.70319 | Safe |

**Source: Based on Data from Altman's Z-Score Model**

The table outlines the financial health of family-controlled companies. Infosys, Aurobindo, HDFC, and Chemipack demonstrate strong financial health, with average scores of 4.94419, 16.80524, 14.26217, and 14.70319, respectively, categorizing them as "Safe." However, Mahindra's negative average score of -0.48289 indicates financial distress, suggesting a risk of bankruptcy. Overall, while most family-controlled companies exhibit robust financial health, Mahindra faces significant challenges, highlighting the importance of prudent financial management table 10& Figure 6.

**Table 10 Overall Summary of Index Included Family Controlled Companies**

| Year | Safe | Grey | Distress | Total |
|---|---|---|---|---|
| **2022-23** | 17 | 2 | 4 | 23 |
| **2021-22** | 17 | 1 | 5 | 23 |
| **2020-21** | 18 | 2 | 3 | 23 |
| **2019-20** | 20 | 1 | 2 | 23 |
| **2018-19** | 15 | 2 | 6 | 23 |

**Source: The Above Data Is Based on Altman's Z-Score Model of 5 Companies**

The table provides an overview of the financial status of index-included family-controlled companies across multiple years. In 2022-23, 17 companies are classified as "Safe," 2 as "Grey," and 4 as "Distress" out of a total of 23 companies.

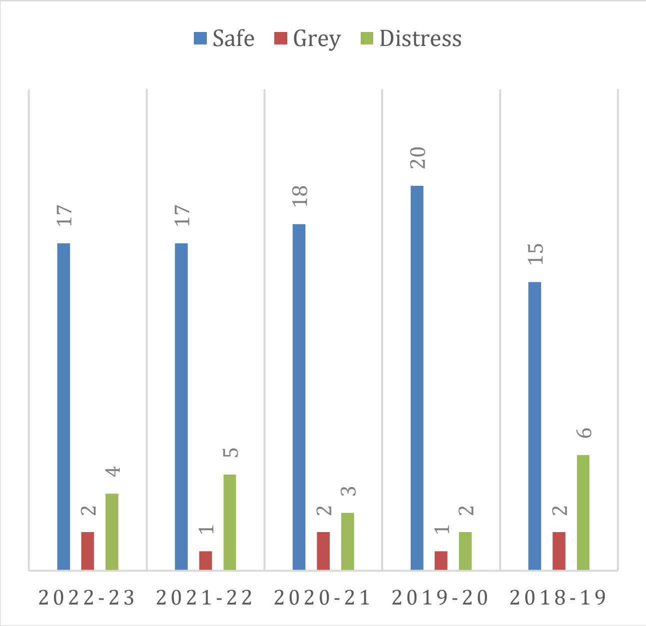


**Figure 6 Overall Summary of Index Included Family Controlled Companies**
**Source: The Graph is Based on Data from Above Table**

Similarly, in 2021-22, 17 companies are "Safe," 1 is "Grey," and 5 are "Distress." In 2020-21, 18 companies are "Safe," 2 are "Grey," and 3 are "Distress." In 2019-20, 20 companies are "Safe," 1 is "Grey," and 2 are "Distress." In 2018-19, 15 companies are "Safe," 2 are "Grey," and 6 are "Distress." Overall, while the majority of companies maintain a "Safe" financial status, some exhibit signs of distress or uncertainty, highlighting the diverse financial landscapes within the index in Table 11. The table illustrates the ranking of financial companies based on their Z-Value across five years. In 2018-19, HDFC and Mahindra hold the top spot, while Infosys and Aurobindo secure second and fourth positions, respectively, and Chemipack ranks fifth. In 2019-20, Infosys claims the top position, followed by HDFC and Mahindra, with Aurobindo and Chemipack falling to fifth and fourth places. In 2020-21, Chemipack takes the lead, with Aurobindo dropping to third place and HDFC to fifth. In 2021-22, Aurobindo rises to second place, while Infosys falls to fourth, and Chemipack ranks third.

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Volume: 02
Issue: 06 June 2024
Page No: 1819-1827

**Table 11** Range of Z-Score Value

| Year | Sample Companies | | Below 1.81 | | Above 1.81 but below 2.99 | | Z-score over 2.99 | |
|---|---|---|---|---|---|---|---|---|
| | Number | Percentage | Number | Percentage | Number | Percentage | Number | Percentage |
| 2018-19 | 23 | 100% | 6 | 26% | 2 | 9% | 15 | 26% |
| 2019-20 | 23 | 100% | 1 | 4% | 2 | 9% | 20 | 4% |
| 2020-21 | 23 | 100% | 3 | 13% | 2 | 9% | 18 | 13% |
| 2021-22 | 23 | 100% | 5 | 21% | 1 | 4% | 17 | 21% |
| 2022-23 | 23 | 100% | 5 | 21% | 2 | 9% | 16 | 21% |

**Source: The Above Table is Anlysis of Data from Altman's Z-Score Model**

**Table 12** Ranking of Financial Companies Based on Z-Value

| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
|---|---|---|---|---|---|
| INFOSYS | 2 | 1 | 3 | 4 | 5 |
| AUROBINDO | 4 | 5 | 3 | 2 | 1 |
| HDFC | 1 | 2 | 5 | 4 | 3 |
| MAHINDRA | 1 | 3 | 4 | 5 | 2 |
| CHEMIPACK | 5 | 4 | 1 | 3 | 2 |

**Source: The Above Table is Data Taken from Z- Score Values of All Companies**

Finally, in 2022-23, Aurobindo emerges as the top-ranked company, with Infosys and HDFC trailing behind in the fifth and third positions, respectively, while Mahindra and Chemipack secure second and fourth places. Overall, the rankings fluctuate over the years, indicating varying financial performances among the companies in table 12.

### 3.2.Discussion

The data encompasses various financial metrics for five companies across five years, offering insights into their financial health and performance. Infosys and HDFC exhibit stable ratios in Working Capital to Total Assets, indicating prudent financial management, while Aurobindo's ratio fluctuates, suggesting occasional liquidity concerns. Conversely, Mahindra faces severe challenges with highly fluctuating and often negative ratios, reflecting persistent liquidity issues. Chemipack maintains moderate stability despite minor fluctuations. Regarding profitability, Infosys, Aurobindo, and HDFC consistently generate earnings, while Mahindra's ratio fluctuates, and Chemipack performs well. Market valuation relative to liabilities varies among companies, with Aurobindo showing substantial growth and Mahindra lagging behind. Sales efficiency relative to total assets also differs among companies, indicating diverse operational efficiencies and market positions. Furthermore, analysis of family-controlled companies highlights strong financial health for most, except Mahindra, which faces significant challenges. The financial status of index-included family-controlled companies fluctuates across years, with varying levels of distress. Lastly, rankings based on Z-Value fluctuate over the years, reflecting changing financial performances among the companies.

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Page No: 1819-1827

## Conclusion

The analysis reveals varying financial performances among the companies, with some demonstrating consistent strength in financial management and stability, while others face challenges such as liquidity concerns and potential distress. It underscores the importance of prudent financial management practices, including effective working capital management, asset utilization, and maintaining a strong financial position relative to liabilities. Implementing strategies to address weaknesses and capitalize on strengths will be crucial for sustained financial health and competitiveness in the market.

## References

[1]. Yanhua Cao and Weiwei Hu (2016) https://shareholderforum.com/access/Library/20150313_Solomon-Soltes.pdf
[2]. Sandra Lourenço and Fátima David (2020) https://www.bportugal.pt/sites/default/files/anexos/papers/wp202018.pdf
[3]. Emad Abdallah and Mohamed Marzouk (2018) https://www.tandfonline.com/doi/full/10.1080/0144039X.2023.2258043
[4]. Gustavo Diniz and Renato José Sassi (2020https://www.academia.edu/download/41814583/Accounting_and_Marketing_Issues_in_UK_20160131-27268-x6juqf.pdf
[5]. Piotr Matuszyk and Maciej Nowak (2019) https://www.academia.edu/download/66614337/2204.pdf