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An analytical study on financial performance analysis of selected biotechnology companies in India

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Abstract
This paper analyzes the financial performance of selected Biotech Companies in India. Population of the study is all the Biotech companies listed in BSE index. Samples have been selected from the population with non-probability sampling method. Four companies have been selected as a sample of the study, Biocon Ltd, Vivo Bio Tech Ltd., Softrak Biotech Ltd. and Genomic Valley Biotech Ltd. Time period of the study is 2019-20 to 2023-24. Ratio analysis has been used as an accounting tool in the study. Net profit ratio, Return on Equity ratio, Return on Assets ratio, Current Ratio, Inventory Turnover ratio and Assets turnover ratio have been used in the study. As a Stastical tool ANOVA Analysis of Variance has been used to measure the difference between ratios of selected companies. Finding of the study is that there is no significant difference between financial ratios of selected four Biotech companies.

Keywords: Biotech, financial performance, net profit, return on equity, return on assets, current ratio, inventory turnover ratio, assets turnover ratio

Introduction

- **What is Biotechnology?**

Biotechnology is a science-based industry sector that creates products related to healthcare by using molecular biology and living organisms. Additionally, biotechnology firms create treatments or procedures (like DNA fingerprinting). The most well-known applications of biotechnology are in medicine and pharmaceuticals, but the science is also used in genomics, food production, and the creation of biofuels.

- **Biotechnology Industry**

One cannot overstate the explosive growth of biotechnology in recent years. Since biotech has a wide range of uses, from energy to healthcare and agriculture, there are several factors driving this explosive growth. Because biotech companies were essential to the development of vaccines and the reopening of the economy, COVID-19 increased awareness of biotechnology. The ability of biotech to create vaccines changed the course of the industry, resulting in previously unheard-of levels of global investment and a surge in start-up activity. In 2022, sky-high investment started to level off as risk-averse investors left the sector due to rising interest rates. Many biotechnology companies will still have to deal with a difficult funding environment in 2024, even though investor uncertainty is decreasing. This effect is lessened globally by increased government spending on biotechnology, particularly in the areas of R&D, accelerated pathways, and novel treatments. Over the previous five years, revenue has increased at a compound annual growth rate (CAGR) of 2.4% to an estimated $558.8 billion, with another 2.4% growth predicted in 2023.

- **Indian Biotechnology Industry**

India is ranked among the top 12 countries for biotechnology, and the Department of Biotechnology (DBT) is committed to creating a research and excellence-oriented environment. In the battle against the Covid-19 pandemic, the biotechnology sector has been instrumental in creating the perfect environment for the manufacture and export of medical devices. The number of new startup registrations in India increased dramatically in 2021, reaching about 6,000 by 2023. The nation boasts more than 1,400 manufacturing facilities that meet WHO standards, 665 FDA-approved facilities, and 44% of the world's ABDAs. In addition, India is the world's second-largest producer of BT cotton and the third-largest producer of recombinant Hepatitis B vaccine.
From $10 billion in 2015 to $130 billion in 2024, India's bio-economy sector has expanded vividly, accounting for 2.6% of the nation's GDP. The Covid-19 vaccination and testing campaign has generated $14.56 billion, or nearly a fifth of India's bio economy. With a total economic contribution of $394 billion, Biopharma makes up the largest portion of the bioeconomy, accounting for 49% of it. By 2025, the Indian vaccination market is expected to be valued at Rs. 252 billion. In just five years, the biotechnology sector has doubled in size, from $30.2 billion to $70.2 billion. It is anticipated that the biotechnology sector in India will grow to $150 billion by 2025 and 270–300 billion by 2030. At a compound annual growth rate (CAGR) of 22%, the Indian biologics market is expected to reach $12 billion by 2025.

- **Financial Performance**

A comprehensive assessment of a business's overall position in relation to assets, liabilities, equity, expenses, revenue, and overall profitability is known as financial performance. It is quantified using a number of business-related formulas that enable users to determine precise information about the potential efficacy of a company.
A company's ability to use resources from its main business and produce income is measured subjectively by its financial performance. Additionally, the term is used as a broad indicator of a company's overall financial health over a specified time frame.
The techniques used to analyze and appraise a company's financial activity are referred to as financial performance analysis. The general financial well-being of the company is referred to as financial performance. Financial assets, which can take many different forms, are used by all businesses to support operations that lead to revenue and eventually

profits. The efficiency with which a business makes profits is the most basic definition of financial performance, but it encompasses much more. It reflects every factor that affects profitability, both holistically as a group dynamic and separately as line items.

Review of literature

(Chieh-Wei Huang, 2015) This study examines six factors and how they interact to determine how much Taiwan's biotechnology sector makes. Annual government investment, annual private investment, the number of national biotechnology incubators, the number of manufacturers that biotechnology incubators support, the number of patents owned by listed companies, and the annual R&D expenditures of listed companies are some of the variables that are examined. This study compares fuzzy-set qualitative comparative analysis of causal complexities with traditional multiple regression analysis of net effects using original and incremental Taiwanese data. The findings show that fsQCA models both kinds of data with causal complexities more effectively than MRA.

(Konde, 2009) Value proposition, value chain structure, and revenue generation are the three main parts of a typical business model. These elements serve to provide a broad overview of a company. There aren't any particular business models or success models that define the biotechnology sector. The industry is characterized by a great deal of diversity as well as innovation, which makes forecasting its future growth challenging. One of the things that have allowed biotechnology companies to thrive during difficult economic times is their immense flexibility. Businesses have been able to shift their focus, alter their business plans, or even enter new markets during times of crisis. A number of Indian companies have concentrated their operations on the creation, production, and distribution of biopharmaceuticals as well as service provision. The Indian businesses seem to be in a strong position to take advantage of their affordable manufacturing skills in order to gain market share and compete globally. Based on the techno-economic dynamics and the main obstacles these companies faced, this paper examines the different business models and strategies used by the biotechnology companies that guided the expansion of the biotechnology industry in the nation.

(Gottinger, 2008) An application of network economics to alliance formation in the biotechnology-pharmaceutical sector is presented in this paper. The framework analysis sheds light on how businesses develop hybrid governance structures and combine economics and strategy to view network strategy from a more comprehensive angle. Different types of firm networks connect market structure, competencies, and network economies, fostering participant integration and change as extra dimensions. "Change" adds a dynamic, progressive element. The network dimension is used in the resulting structures as a mechanism design to examine the life cycles and evolution of firm networks. The framework is developed through an analysis of alliances in the biotechnology and pharmaceutical industries, which includes a historical tracing and an empirical investigation of the correlation between the market performance of major pharmaceutical companies operating globally and their collaboration rate (CR).

(watanabe, 2004) This paper examines the catching up of late-industrializing economies using the biotech sector in India as a case study. Numerous inferences can be made. First, the success of domestic businesses depends on their capacity for innovation. Second, a number of institutional factors, including government-imposed price controls, technology transfer from Indian public and international research institutions, and government and international charity organization funding, have promoted the development of indigenous technology in domestic companies in India. Third, local businesses have made use of their manufacturing capacity to swiftly commercialize the technology and put the money they make back into research and development.

(Palnitkar, 2005) The development and expansion of Indian biotech firms in recent years are covered in the paper. It emphasizes the activities and accomplishments of some of the globally competitive companies across a range of market segments and focuses on the alternative business models that major industry players have adopted. The article also details recent advancements in the sector concerning global partnerships and product creation, investment, and growth. India is becoming more and more acknowledged as a nation that combines affordable research and manufacturing resources with a quickly developing environment for the creation and protection of intellectual property (IP). Indian businesses are working to advance up the value chain in specialized fields within the biotechnology industry. Indeed, there is a definite chance for international players.

Objective of the study

To evaluate and contrast the Financial Performance standing of selected Biotechnology companies in India

Research methedology

- **Sample Selection:** Samples of the study have been selected with non-probability sampling method. Convenience sampling technique has been used for the sample selection. Following are the samples have been selected based on net profit of the year 2023-24.

1. Biocon Ltd
2. Vivo Bio Tech Ltd
3. Softrak Biotech Ltd
4. Genomic Valley Biotech Ltd

- **Time Period of the Study:** 2019-20 to 223-24 has been the time frame of the study.

- **Hypothesis of the Study**

H0: There is no significance difference between financial ratios of selected Biotech Companies.

H1: There is a significance difference between financial ratios of selected Biotech Companies.

Financial Ratios used in the Study

- Net Profit Ratio
- Return on Equity
- Return on Assets
- Current Ratio
- Inventory Turnover Ratio
- Assets Turnover Ratio

Stastical tool used in the Study: To measure the difference between the ratios ANOVA Analysis of variance has been used.

Data analysis and interpretation

1. Net Profit Ratio

Year /Company	Biocon Ltd	Vivo BioTech Ltd	Softrack Biotech Ltd	Genomic Valley Biotech Ltd
2019-20	22.17	8.02	-365.35	33.78
2020-21	13.82	10.02	0.00	-268.67
2021-22	4.95	4.28	52.97	-13.23
2022-23	142.92	5.10	2.70	23.81
2023-34	5.60	5.62	3461.53	9.19
Minimum	4.95	4.28	-365.35	-268.67
Maximum	142.92	10.02	3461.53	33.78
Average	37.89	6.60	630.37	-43.02

(In percentage) (www.moneycontrol.com)

Analysis

For the Biocon Ltd maximum net profit ratio is 142.92% in the year 2022-23 while minimum is 4.95% in the year 2021-22. Biocon ltd is having fluctuating trend in this five year of study period. From 22.17% net profit ratio in year 2019-20 to 5.60% in the year 2023-24 in middle of the study period in 2022-23 there was a highest net profit ratio 142.92%. Vivo BioTech Ltd also has shown the instable trend in this five year of the study period. From the year 2019-20 with 8.02% then it increased to 10.02% in 2020-21, while in 2021-22 it decreased to 4.28% then in next two years it reached to 5.10% and 5.62%. Softrack Biotech Ltd has shown the increasing trend in net profit ratio during the study period from -365.35% in the year 2019-20 to 3461.53% in the year 2023-24. Genomic Valley Biotech Ltd has shown the mixed trend during the study period from 2019-20 to 2023-24. Minimum net profit ratio was in the year 2020-21 -268.67% while maximum is 33.78% in the year 2019-20. Among all four companies Softrack Biotech Ltd has the highest average 630.37% during the study period while Valley Biotech Ltd has the lowest average -43.02 during the study period.

Application of ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1504448	3	501482.5	0.785826	0.519186	3.238872
Within Groups	10210556	16	638159.7			
Total	11715003	19				

At 5% level of significance calculated value is 0.78 while the table value is 3.23. Here table value is higher than the calculated value which means that null hypothesis is accepted that there is no significant difference between net profit ratios of selected Biotech companies.

2. Return on Equity

Year /Company	Biocon Ltd	Vivo BioTech Ltd	Softrack Biotech Ltd	Genomic Valley Biotech Ltd
2019-20	5.85	13.45	-0.10	5.66
2020-21	3.54	13.36	-0.24	-12.45
2021-22	1.06	4.67	0.18	-0.32
2022-23	26.09	5.07	0.03	18.38
2023-34	1.09	4.63	4.76	0.42
Minimum	1.06	4.63	-0.24	-12.45
Maximum	26.09	13.45	4.76	18.38
Average	7.52	4.63	0.92	2.33

(In percentage) (www.moneycontrol.com)

Analysis

Biocon Ltd has the maximum return on equity in year 2022-23 26.09% while minimum in the year 2021-22 1.06%. Overall Biocon Ltd has shown the mixed trend during the study period. Vivo BioTech Ltd has shown the decreasing trend in return on equity ratio during the study period. In the beginning year 2019-20 with 13.45% and in last year 2023-24 4.63%. Softrack BioTech Ltd has shown the increasing trend during the study period. Minimum ROE of Softrack BioTech is -0.24 in the year 2020-21 while maximum 4.76 is in year 2023-24. Genomic Valley Biotech Ltd has also shown mixed trend during the study period. Highest ROE was in year 2022-23 18.38% while lowest in the year 2020-21 -12.45%.

Application of ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	201.4946	3	67.16487	1.021503	0.409223	3.238872
Within Groups	1052.016	16	65.751			
Total	1253.511	19				

Here at 5% level of significance table value is 3.23 while calculated value is 1.02 which is lesser than the table value. It means that alternative hypothesis is rejected and null hypothesis is accepted that there is no significant different between the Return on Equity ratios of selected Biotech Companies

Return on Assets

Year /Company	Biocon Ltd	Vivo BioTech Ltd	Softrack Biotech Ltd	Genomic Valley Biotech Ltd
2019-20	5.30	7.23	-0.10	3.57
2020-21	3.27	7.35	-0.24	-7.33
2021-22	0.97	1.83	0.17	-0.24
2022-23	21.86	2.18	0.03	14.66
2023-34	0.86	1.87	4.68	0.35
Minimum	0.86	1.83	-0.24	-7.33
Maximum	21.86	7.35	4.68	14.66
Average	6.45	4.09	0.90	2.20

(In percentage) (www.moneycontrol.com)

Analysis

In year 2022-23 Biocon Ltd has 21.86% return on assets which is maximum during the five year study period from 2019-20 to 2023-24. Minimum return on assets of Biocon Ltd is 0.86% in the year 2023-24. So Biocon Ltd is having mixed trend in Return on Assets ratio during the study period. Vivo BioTech has also shown the mixed trend in return on assets ratio during the study period from 2019-20 to 2023-24. Minimum ROA is 1.83% in the year 2021-22 while maximum is 7.35% in the year 2020-21. Softrack Biotech Ltd is showing the increasing trend in return on assets ratio during the study period. Minimum ROA was in the beginning year 2019-20 -0.10% while the maximum was in the last year 2023-24 4.68%. Genimic Valley Biotech Ltd is also having the mixed trend during the study period. In the year 2020-21 ROA was -7.33% which was the minimum while, in 2022-23 ROA was 14.66% which was maximum during the study period.

Application of ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	87.19053	3	29.06351	0.750564	0.53785	3.238872
Within Groups	619.5557	16	38.72223			
Total	706.7463	19				

Here table value is 3.23 while calculated value is 0.75 at 5% level of significance. Table value is higher than the calculated value that's why null hypothesis is accepted that there is no significant difference between the Return on Assets ratios of selected companies.

4Current Ratio

Year /Company	Biocon Ltd	Vivo BioTech Ltd	Softrack Biotech Ltd	Genomic Valley Biotech Ltd
2019-20	2.86	1.36	251.84	0.53
2020-21	3.94	1.29	181.92	0.19
2021-22	4.07	1.17	438.65	5.31
2022-23	3.68	1.32	2785.26	2.89
2023-34	3.99	1.28	51.13	3.68
Minimum	2.86	1.17	51.13	0.19
Maximum	4.07	1.36	2785.26	5.31
Average	3.70	1.28	741.76	2.52

(In times) (www.moneycontrol.com)

Analysis

Current ratio of Biocon Ltd was 2.86 times in the year 2019-20 then in next two year it increased to 3.94 and 4.07 times. After 2021-22 it started to decline and it declined up to 3.99 times in the year 2023-24. Vivo BioTech Ltd has also shown the mixed trend in current ratio during the study period. Maximum current ratio of Vivo BioTech Ltd was 1.36 times in the year 2019-20 while the minimum was 1.17 times in the year 2021-22. Softrack Biotech Ltd has increasing trend in current ratio till 2022-23 after that it got reduced to very drastic level. Maximum current ratio was 2785.26 times in the year 2022-23 while minimum was 51.13 times in the year 2023-24.in 2019-20 Genomic Valley Biotech Ltd has 0.53 times current ratio then in 2020-21 it decreased to 0.19 times in the next year 2020-21. After that in 2021-22 it increased to 5.31 times which was highest during the study period. Then in next year it reduced to 2.89 times and after that in 2023-24 it increased to 3.68 times.

Application of ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2049388	3	683129.2	2.062978	0.145555	3.238872
Within Groups	5298200	16	331137.5			
Total	7347587	19				

At 5% level of significance given table value is 3.23 while calculated value is 2.06 which is lesser than the table value. So here, alternative hypothesis is rejected and null hypothesis would be accepted that there is no significant difference between Current ratios of selected Biotech Companies.

Inventory Turnover Ratio

Year /Company	Biocon Ltd	Vivo BioTech Ltd	Softrack Biotech Ltd	Genomic Valley Biotech Ltd
2019-20	3.72	5.23	0.00	6.83
2020-21	4.71	3.90	0.00	0.00
2021-22	1.88	0.00	0.00	0.00
2022-23	1.78	0.00	0.00	0.00
2023-34	1.69	0.00	0.00	0.00
Minimum	1.69	0.00	0.00	0.00
Maximum	4.71	5.23	0.00	6.83
Average	2.75	1.82	0.00	1.36

(In times) (www.moneycontrol.com)

Analysis

Biocon Ltd has 3.72 times inventory turnover ratio in the year 2019-20 then in next year it increased to 4.71 times. After that next three years it reduced to 1.88, 1.78 and 1.69 times. So Biocon Ltd has the mixed trend in inventory turnover ratio during the study period. In 2019-20 Vivo BioTech Ltd was operating at 5.23 times inventory turnover ratio after that in next year it got reduced to 3.90 times in 2020-21. From 2021-22 to 2023-24 inventory turnover ratio was 0.00 times for Vivo BioTech Ltd. Softrack Biotech Ltd has also 0.00 times inventory turnover ratio during the study period. Genomic Valley Biotech Ltd has 6.83 times inventory turnover ratio in 2019-20. After 2019-20 it got reduced to 0.00 times in next four years.

Application of ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	19.75546	3	6.585153	1.487868	0.255654	3.238872
Within Groups	70.81436	16	4.425898			
Total	90.56982	19				

Here at 5% level of significance table value is 3.23 while calculated value is 1.48. Calculated value is lesser than the table value it means that null hypothesis is accepted that there is no significant difference between Inventory Turnover ratios of selected Biotech companies.

Assets Turnover Ratio

Year /Company	Biocon Ltd	Vivo BioTech Ltd	Softrack Biotech Ltd	Genomic Valley Biotech Ltd
2019-20	23.92	90.11	0.02	10.57
2020-21	23.65	66.97	0.00	2.73
2021-22	0.20	0.52	0.00	0.01
2022-23	0.18	0.43	0.01	0.66
2023-34	0.16	0.35	0.00	0.04
Minimum	0.16	0.35	0.00	0.01
Maximum	23.92	90.11	0.02	s10.57
Average	9.62	31.67	0.006	2.80

(In percentage) (www.moneycontrol.com)

Analysis

Biocon Ltd is having the decreasing trend in Asset turnover ratio. Starting from the year 2019-20 it was 23.92% after that it reduced to 23.65% in 2020-21. In the next two years it reduced to 0.18 and 0.16%. Vivo BioTech Ltd has also the decaling trend in assets turnover ratio. With 90.11% in 2019-20 it was topmost during the study period. Minimum was in the year 2023-24 0.35%. Softrack Biotech Ltd has highest assets turnover ratio in 2019-20 which was 0.02% while minimum was 0.00% which was in three year 2020-21, 2021-22 and 2023-24. Genomic Valley Biotech Ltd has also the decline trend in assets turnover ratio during the study period. 10.57% was the maximum in the year 2019-20 while minimum was 0.01% in the year 2021-22.

Application of ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3087.341	3	1029.114	1.974897	0.158414	3.238872
Within Groups	8337.558	16	521.0974			
Total	11424.9	19				

Here at 5% level of significance calculated value is 1.97 while table value is 3.23. Table value is greater than the calculated value which means that null hypothesis is accepted and alternative hypothesis is rejected. It means that there is no significant difference between the Assets Turnover ratios of selected Biotech companies.

Result of the study

No	Ratio	Calculated Value	Table Value	Result
1.	Net Profit Ratio	0.785	3.238	H0 Accepted
2.	Return on Equity	1.021	3.238	H1 Rejected

3.	Return on Assets	0.750	3.238	H1 Rejected
4.	Current Ratio	2.062	3.238	H0 Accepted
5.	Inventory Turnover	1.487	3.238	H0 Accepted
6.	Assets Turnover	1.974	3.238	H0 Accepted

Findings

- From the all above ratio analysis it is identical that Softrack Biotech Ltd is improving year by year because most of the ratios were in increasing trend.
- In Net Profit analysis Softrack Biotech Ltd performing the best amongst four companies, after then Biotech is on second position with 37.89% of average of five years.
- Biocon Ltd is performing the best in Return on Equity ratio with the highest average amongst all four companies, while Vivo BioTech Ltd and Genomic Valley Biotech also doing good in terms of decent average during the study period.
- In Return on Assets ratio analysis with 6.45% of average of five year study period Biocon secured the first position amongst all four companies. While despite of increasing trend during the five year time period Softrack Biotech Ltd is on least position amongst all four companies.
- Softrack Biotech Ltd has the highest average in current ratio analysis amongst all four companies. Except the Softrack other three companies are also performing well.
- Biocon Ltd is securing the first position in inventory turnover ratio also with the highest average of 2.75 times during the five year of study period. Vivo BioTech Ltd and Genomic Valley Biotech Ltd are also having good average of inventory turnover ratio while Softrak is having zero time turnover rates all five year.
- In Assets turnover ratio Vivo BioTech Ltd is performing the best amongst all four companies. While Softrack is the least amongst all with 0.006% average of five year ratio analysis.

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