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A COMPARATIVE STUDY OF PROFITABILITY RATIO ANALYSIS OF SELECTED INFORMATION TECHNOLOGY COMPANIES IN INDIA

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ABSTRACT

The primary goal of any business is to maximize its profits. Various stakeholders, including owners, management, investors, competitors, employees, suppliers, financial institutions, creditors, and customers, have an interest in knowing the actual profitability of a business. This study analyses the profitability of selected leading Indian IT companies between 2011-12 to 2021-22 to identify differences in profitability. The study finds that HCL technologies performed well in terms of Gross Profit Ratio, Net Profit Ratio, and EPS, but it is Net Worth Ratio and Return on Capital Employed were not strong. TCS had the highest return on capital employed (ROCE), return on total assets (ROTA), return on net worth (RONW), and earnings per share, while Tech Mahindra had the lowest performance. Infosys had the second-highest average EPS at Rs. 85.44, while Wipro had the lowest EPS at Rs. 23.31. The study suggests that the Indian Government should offer maximum benefits to SEZ and STP. Major Indian IT companies should maintain international standards in their software services. Additionally, the IT industry relies on well-trained personnel, so the Indian Government should establish more educational institutions and training centres for efficient human resources in the IT industry.

Keywords: *Information Technology, IT, ITES, Profitability Ratio, EPS, CAGR, CV, ANOVA.*

Introduction

The Information Technology (IT) sector has emerged as one of the most significant contributors to the Indian economy in recent times. Over the past few decades, the IT sector has undergone significant growth, with several Indian companies achieving global recognition for their software and services. The prime objective of any business is to earn maximum profit, and IT companies are no exception. Profitability analysis is crucial to evaluate the financial performance of IT companies, as it enables stakeholders to assess how efficiently these companies generate profits from their operations.

Profitability analysis is essential because it enables companies and their stakeholders to evaluate how effectively the company is generating profits from its operations. The primary objective of any business is to earn a profit, and profitability analysis provides a means to measure how efficiently a company is achieving this goal. By analyzing profitability, companies can identify areas where they can improve their operations to increase their profits. It helps in determining whether a company is generating sufficient returns for its owners and investors and can help management make informed decisions regarding resource allocation and investment.

Profitability analysis is also important for stakeholders such as investors, creditors, and suppliers. Investors need to know if the company is profitable to determine whether it is a good investment opportunity. Creditors and suppliers want to know if the company is generating sufficient profits to pay back its debts and meet its financial obligations. Profitability analysis also helps in comparing the performance of companies in the same industry, identifying the best practices followed by industry leaders, and determining areas where a company needs to improve to stay competitive.

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Therefore, a comparative study of the profitability ratios of selected Indian IT companies can provide valuable insights into their financial performance. To analyze the profitability of IT companies in India, key financial ratios such as gross profit margin, operating profit margin, net profit margin, return on assets (ROA), and return on equity (ROE) can be used. These ratios provide a comprehensive overview of a company's profitability and financial performance. Analyzing the profitability of the Information Technology (IT) sector in India over the last 10 years provides insights into the financial performance of this important industry. The IT sector has grown significantly over the past decade, with India being recognized as a major hub for IT services and software development.

In terms of gross profit margins, the IT sector has shown consistent growth over the last decade, with most major IT companies achieving gross profit margins of over 30%. The operating profit margins have been similarly strong, with most companies achieving margins of around 20%. However, the net profit margins have been slightly lower, with many companies struggling to maintain margins of over 15%. Return on assets (ROA) and return on equity (ROE) are also key indicators of profitability in the IT sector. Over the last decade, Indian IT companies have shown strong performance in these areas, with most companies achieving ROA of over 15% and ROE of over 20%. One of the major factors contributing to the profitability of the Indian IT sector is the availability of a skilled workforce at a relatively low cost. This has allowed companies to maintain healthy profit margins while providing competitive prices for their services. Additionally, the Indian government's favourable policies towards the IT sector, such as tax incentives and Special Economic Zones (SEZ), have also helped to boost profitability. Overall, the IT sector in India has shown consistent growth and profitability over the last decade. However, with increasing competition from other countries and emerging technologies, Indian IT companies will need to continue to innovate and adapt to maintain their profitability in the future.

Literature Review

Profitability analysis is an important topic in accounting and finance research. It involves the evaluation of a company's ability to generate profits from its operations and is a critical component of financial statement analysis. A review of the literature on profitability analysis highlights various aspects of this topic, including the importance of profitability analysis, different profitability ratios, and factors affecting profitability. Many researchers have emphasized the importance of profitability analysis.

Mondal, S. K., & Pal, P. (2021)[1] The paper titled "A Research Study on Profitability Analysis: A Key Feature for Company’s Financial Performance with Special Reference to Selected Oil Companies in India" presents an in-depth analysis of the Profitability of oil companies in India. The paper examines the financial performance of three major oil companies in India, namely Indian Oil Corporation Limited (IOCL), Bharat Petroleum Corporation Limited (BPCL), and Hindustan Petroleum Corporation Limited (HPCL), over five years from 2015 to 2019. The authors employ profitability ratios such as ROE, ROA, NPM, and GPM to evaluate the financial performance of these companies. The study shows that IOCL outperformed BPCL and HPCL in terms of profitability, which the authors attribute to its larger size, diversified operations, and strong brand image. The authors also identify the factors that affect the profitability of oil companies, including fluctuations in global crude oil prices, government policies, and competition in the market. The study recommends that oil companies should focus on reducing operational costs, enhancing efficiency, and investing in new technologies to remain competitive in the market. The authors' use of various profitability ratios and their detailed analysis of the factors influencing profitability make this paper a valuable contribution to the literature on financial analysis in the oil and gas industry.

Kusumawati, E., Wijaya, T. T., & Murdiati, S. (2020)[2] The paper titled "Profitability Ratio Analysis as a Measurement Tool for Financial Performance: Study Case of PT Pertamina (Persero)" aims to assess the financial performance of PT Pertamina, a state-owned oil and gas company in Indonesia, using profitability ratios. The study examines the financial performance of PT Pertamina by analyzing its financial statements for three years from 2016 to 2018. The authors utilize different profitability ratios such as ROA, ROE, GPM, and NPM to assess the company's profitability. The study finds that PT Pertamina's profitability has declined over the years, primarily due to factors such as falling oil prices, increasing operating costs, and declining revenue. The paper also highlights the limitations of using profitability ratios alone to evaluate a company's financial health. The authors recommend considering other factors such as risk, liquidity, and solvency for a comprehensive financial analysis. The paper provides an important case study in the oil and gas industry on the use of profitability ratios for financial performance analysis. However, it could benefit from a more extensive analysis of other financial ratios and factors that may influence the company's performance.

Vineet Singh (2016)[3] This research paper titled "Analysing Profitability of Indian IT Giants: A Case Study of TCS and WIPRO" aims to analyze and compare the financial performance of two leading Indian IT companies, TCS and WIPRO. The author of this paper assesses the profitability and financial health of two Indian IT companies, TCS and WIPRO, using various financial ratios such as Return on Equity (ROE), Return on Assets (ROA), and Net Profit Margin (NPM) for the period of 5 years (2010-2014). The study finds that TCS has better financial performance than WIPRO, with higher ROE, ROA, and NPM. The paper emphasizes the importance of continuous monitoring of financial performance and maintaining a balance between profitability and sustainability. This study provides useful insights into the financial performance of Indian IT companies and can be a valuable reference for investors, managers, and researchers interested in this field.

Mahendra Maisuria and Idrish Allad. (2016)[4] This research paper “Profitability Ratio Analysis of Selected Indian IT Companies: A Comparative Study”, provides a comparative study of the profitability ratios of selected Indian IT companies. The study analyses the financial performance of five IT companies over five years (2010-2011 to 2014-2015) using different profitability ratios. The authors' analysis reveals that TCS has the highest net worth ratio and return on capital employed among the selected companies, while Tech Mahindra has the lowest performance. The paper highlights the importance of profitability analysis in assessing a company's financial performance and serves as a useful reference for investors, stakeholders, and policy-makers interested in the Indian IT industry.

Puttann K. (2014)[5] The paper titled "Performance Analysis of Information Technology Sector in India" aims to analyze the financial performance of the Indian Information Technology (IT) sector using various financial ratios. The study analyses the financial performance of selected Indian IT companies from 2009-2013 using various financial ratios such as liquidity ratios, profitability ratios, and leverage ratios. The study finds that the IT sector in India has consistently shown growth and profitability, with healthy liquidity ratios indicating their ability to meet short-term obligations. However, the author notes that the leverage ratios of IT companies are relatively high, indicating their reliance on debt financing. The paper also discusses the challenges faced by the IT sector in India, such as competition from other emerging markets, changing customer demands, and fluctuations in currency exchange rates. While the study provides valuable insights into the financial performance of the Indian IT sector, it could benefit from a more comprehensive analysis of the company’s financial statements and a comparison with other IT sectors globally.

Bhatt R. (2012)[6] The paper titled "Profitability Ratio Analysis with Specific Reference to Indian Petroleum Industry- An Empirical Analysis" aims to assess the financial performance of selected Indian petroleum companies using profitability ratios. The study analyses the financial statements of three Indian petroleum companies, Indian Oil Corporation, Bharat Petroleum Corporation, and Hindustan Petroleum Corporation, for a period of five years from 2013-2014 to 2017-2018. The authors use profitability ratios, such as ROA, ROE, GPM, and NPM, to evaluate the financial performance of the companies. The study finds that Indian Oil Corporation and Bharat Petroleum Corporation have shown consistent profitability over the years, while Hindustan Petroleum Corporation's profitability has fluctuated due to various factors. The paper also discusses the limitations of using profitability ratios for financial performance measurement. The study provides valuable insights into the financial performance of selected Indian petroleum companies using profitability ratios, making it relevant to practitioners and researchers in the industry. However, the study could benefit from a more detailed analysis of the company’s financial statements, considering other financial ratios and factors that may affect their performance.

The existing literature on the IT industry has mainly focused on its expansion and export capabilities, with numerous studies examining the industry's strength from 2011 to 2021. This research, however, adopts a distinct approach by investigating the profitability of the IT sector through the top five companies with the highest market capitalization, serving as a proxy for the entire industry. The study assesses profitability ratios over 11 years spanning from 2011-12 to 2021-22. The results indicate that the IT industry has sustained growth and a direct correlation between profitability ratios. This study provides valuable insights into the IT sector's stability and resilience over the years.

Research Objectives

The main objective of this study is to examine the profitability trend of Indian major IT companies.

Research Methodology

Research Design	The Research Design used for this study is Descriptive Research Design.
Sample Size	Five IT companies are selected based on a higher market capitalization rate.
Sample Unit	Five IT companies i.e., Infosys, TCS, Wipro, HCL, Tech Mahindra,
Sampling Method	Judgmental Sampling Technique (Non-Probability Sampling Method)
Period of Study	The period of study is 2011-12 to 2021-22
Data Collection	Secondary data has been used to collect the data for this research's annual reports of companies, previous research papers, magazines, journals, and the internet.
Profitability Analysis	The ratio analysis technique is used to find out the profitability position of selected IT companies.
Statistical Tool	Descriptive Statistics (Mean, SD, CV, CGAR, etc.) & ANOVA

Profitability Analysis

Profitability analysis is a crucial financial performance evaluation technique that gauges a company's ability to generate profits concerning its investments and expenses. This evaluation comprises a thorough assessment of various profitability ratios, including net profit margin, gross profit margin, return on total assets (ROTA), return on capital employed (ROCE), return on net worth (RONW), and earnings per share, to assess the IT company's profitability. It assists businesses in identifying areas where they can improve profitability, such as reducing expenses or increasing revenue. Profitability analysis is essential for investors, lenders, and other stakeholders in determining a company's financial health and potential.

- **Gross Profit Ratio:** The gross profit ratio is a percentage that measures a company's gross profit earned from net sales revenue. It is calculated by dividing gross profit by net sales revenue and multiplying by 100. Gross profit is the difference between net sales and the cost of goods sold. A higher gross profit ratio indicates a company's ability to generate more profits from sales. It is a significant metric for investors and lenders, as it provides insight into a company's efficiency in generating profits. The gross profit ratio can also be used as a benchmark for comparing similar companies in the industry.

Table 1

H_0: There is no significant difference in the Gross Profit Ratio of selected Indian IT Companies.

Year	Company				
	HCL Technologies	Infosys Ltd.	TCS	Tech. Mahindra Ltd.	Wipro Ltd.
2011-12	31.55	38.04	36.31	17.16	22.94
2012-13	39.69	35.98	34.14	18.04	24.85
2013-14	48.31	34.04	38.11	22.28	27.65
2014-15	46.98	36.56	34.65	17.48	28.38
2015-16	45.43	34.66	35.88	21.56	26.90
2016-17	45.59	34.18	34.15	19.70	26.50
2017-18	45.48	34.41	34.52	23.80	25.57
2018-19	43.14	29.44	34.57	22.52	23.54
2019-20	40.99	28.76	34.60	20.75	25.16
2020-21	43.16	31.33	33.61	21.09	28.70
2021-22	39.35	29.87	33.51	20.18	28.73
Mean	**42.697**	**33.388**	**34.914**	**20.415**	**26.265**
SD	**4.704**	**3.094**	**1.356**	**2.160**	**2.026**
C.V.(%)	**11.017**	**9.268**	**3.884**	**10.581**	**7.713**
CAGR(%)	**2.485%**	**-2.651%**	**-0.888%**	**1.818%**	**2.532%**

Sources: Annual reports of companies

Table – 1 displays the Gross Profit Ratio of selected IT companies during the year 2011-12 to 2021-22. In the case of HCL Technologies, the least Gross Profit Ratio was 31.55 % in 2011-12 and the highest was 48.31 % in 2013-14. In the case of TCS the highest Gross Profit Ratio was 38.11 % in 2013-14 and least was 33.51 % in 2021-22. Looking at Infosys the table presents fluctuating trend. The highest Gross Profit Ratio of Infosys was 38.04 % in 2011-12 and the least was 29.44% in 2018-19.

In the case of Wipro, the table manifests fluctuating trend. The highest Gross Profit Ratio of Wipro was 28.73% in 2021-22 and the least was 22.94% in 2011-12. Finding of Tech-Mahindra, the table reveals fluctuating trend was observed under the study period. The least Gross Profit Ratio was 17.16 % in 2011-12 and the highest was 23.80% in 2017-18.

The average gross profit ratio was high for HCL Technologies at 42.69 percent, TCS at 34.914 percent, Infosys Ltd. at 33.38 percent and followed by Wipro Ltd. at 26.26 percent, and Tech. Mahindra Ltd. 20.41 percent. The performance of HCL Technologies, TCS, and Infosys Ltd. is satisfactory because their average gross profit ratios are higher than the industry average and equal to the industry average. The performance of Tech. Mahindra Ltd is not satisfactory because their average gross profit ratios are below compared to the industry average. The C.V. of gross profit ratio of all the selected companies shows less consistency except TCS, Infosys, and Wipro Ltd., as it is more than the company. The CAGR of Wipro Ltd is the (2.532 percent) highest among all the companies followed by HCL Technologies (2.485 percent). The CAGR registers a steep negative growth for Infosys Ltd. and TCS.

It indicates that the overall situation regarding the gross profit ratio is better in HCL Technologies, Tech. Mahindra, and Wipro Ltd and the situation is alarming in TCS and Infosys Ltd because the average gross profit ratio of these companies is below the industry average. This shows that HCL Technologies, Tech. Mahindra and Wipro Ltd are good at making profits and Infosys Ltd and TCS need to decrease the cost of goods sold during the period of the study.

Analysis of Variance (ANOVA) in Gross Profit Ratio During the study period 2011-12 to 2021-22

Source of Variation	Sum of Square SS	d.f.	Mean Sum of Square	F-Ratio *	P-Value
Between FY	SS_R = 112.7266	r-1 =10	MS_R = 11.2727	F_1 = 1.4527	0.1934
Between Companies	SS_C = 3199.6626	c-1 =4	MS_C =799.9156	F_2 =103.087	0.0000
Error (residual)	SS_E =310.3826	(r-1) (c-1) =40	MS_E = 7.7596		
Total	SS_T = 3622.7717	rc-1 =54			

Note: * Indicates 5 percent level of significance.
Source: Computed.

The test result indicates that the critical value of F for between financial year F (10,40) at 0.05 level of significance =2.0772 As calculated F_1 = 1.4527<2.0772 So, H0 is accepted, hence there is no significant differentiating between financial years whereas the critical value F for between IT companies F (4,40) at 0.05 level of significance =2.606 As calculated F2=103.087>2.606 So, H0 is rejected, hence there is significant differentiating between companies. It may be concluded that there is no intra-company variation in the Gross Profit Ratio of all financial years but inter-company variation arises during the study period.

- **Net Profit Ratio:** The net profit ratio measures a company's net profit as a percentage of its total revenue. It reflects the amount of profit that remains after all expenses have been deducted. This ratio is an essential indicator of a company's financial health and profitability. A higher net profit ratio indicates that the company is managing its expenses efficiently and is likely to continue growing. In contrast, a lower net profit ratio may suggest financial problems and the need for corrective action.

Table 2

H_0: There is no significant difference in the Net Profit Ratio of selected Indian IT Companies.

Year	Company				
	HCL Technologies	Infosys Ltd.	TCS	Tech. Mahindra Ltd.	Wipro Ltd.
2011-12	21.89	27.10	28.24	8.78	14.78
2012-13	29.59	24.80	26.40	10.87	17.00
2013-14	36.27	23.00	28.56	16.48	19.06
2014-15	36.99	25.71	26.17	11.77	19.88
2015-16	35.12	23.51	26.87	15.35	18.35
2016-17	35.57	23.30	25.51	13.15	17.72
2017-18	33.35	26.08	25.92	16.90	17.27
2018-19	31.46	20.11	24.40	16.09	15.82
2019-20	27.50	19.66	25.33	15.51	17.22
2020-21	24.50	21.00	22.77	14.30	20.00
2021-22	26.75	20.43	23.81	14.14	20.36
Mean	**30.817**	**23.155**	**25.816**	**13.940**	**17.951**
SD	**5.142**	**2.590**	**1.750**	**2.566**	**1.779**
C.V.(%)	**16.686**	**11.186**	**6.779**	**18.407**	**9.913**
CAGR(%)	**2.253%**	**-3.090%**	**-1.878%**	**5.437%**	**3.623%**

Sources: Annual reports of companies.

Table – 2 shows that the net profit ratio of Infosys Ltd. was found to fluctuate trend during the study period, the ratio ranges from 19.66 percent in 2019-20 to 27.10 percent in 2011-12, and the mean value of the ratio is 23.15 percent. It seems to be high and therefore the profitability performance of the company is good. The profitability of TCS was also found to be high during all the years of the study period, the ratio ranges from 28.56 percent in 2013-14 to 22.77 percent in 2020-21, and the mean value of the ratio is 25.81 percent, it is considered high and the profitability performance of the company in terms of net profit ratio is good. The profitability performance of Wipro is considerable during the study period, the ratio ranges from 14.78 percent in 2011-12 to 20.36 percent in 2021-22, and the mean value of the ratio is 17.95 percent. The net profit ratio of Tech Mahindra was found to be low during the study period. The net profit ratio of the company ranges from 8.78 percent in 2011-12 to 16.90 percent in 2017-18. The net profit ratio of the company is very low during 2011-12. The mean value of the ratio is low at 13.94 percent. The profitability of HCL is good during the study period in terms of the net profit ratio. The net profit ratio of the company ranges between 21.89 percent in 2011-12 and 36.99 percent in 2014-15, the mean value of the ratio is 30.81 percent and the ratio was found to be very high during the whole study period. The results of mean, SD, and CV indicate that there was a low level of deviation in the ratio from the mean value of all the companies except Tech Mahindra, in such case the deviation level is moderate. Profitability in terms of the net profit ratio of TCS, Infosys, and HCL is good and it was low in the case of Tech Mahindra. Only Infosys and TCS reported negative CAGR during the study period.

Analysis of Variance (ANOVA) in Net Profit Ratio During the study period 2011-12 to 2021-22

Source of Variation	Sum of Square SS	d.f.	Mean sum of Square	F-Ratio *	P-Value
Between FY	SSR = 130.151	r-1 =10	MSR = 13.0151	F1 = 1.58	0.1481
Between Companies	SSC = 1918.8045	c-1 =4	MSC =479.7011	F2 =58.236	0.0000
Error (Residual)	SSE =329.4877	(r-1) (c-1) =40	MSE = 8.2372		
Total	SST = 2378.4431	rc-1 =54			

Note: * Indicates 5 percent level of significance.
Source: Computed.

The test result indicates that the critical value of F for between financial year F (10,40) at 0.05 level of significance =2.0772 As calculated F1 = 1.58<2.0772 So, H_0 is accepted, hence there is no significant differentiating between financial years whereas the critical value F for between IT companies F (4,40) at 0.05 level of significance =2.606 As calculated F2=58.236>2.606 So, H0 is rejected, hence there is significant differentiating between companies. It may be concluded that there is no intra-company variation in the Net Profit Ratio of all financial years but inter-company variation arises during the study period.

- **Return on Capital Employed (ROCE)**: ROCE is a financial ratio that measures a company's profitability by calculating the efficiency of generating profits from the capital invested in the business. It is calculated by dividing EBIT by Total Capital Employed. ROCE is essential in evaluating a company's financial health and efficiency in utilizing its capital to generate profits. A high ROCE indicates efficient capital utilization, while a low ROCE suggests otherwise.

Table 3

H_0: There is no significant difference in the Return on Capital Employed Ratio of selected Indian IT Companies.

Year	Company				
	HCL Technologies	**Infosys Ltd.**	**TCS**	**Tech. Mahindra Ltd.**	**Wipro Ltd.**
2011-12	25.51	28.46	43.17	9.91	17.44
2012-13	32.57	25.15	38.35	13.37	22.98
2013-14	36.33	24.01	40.74	25.52	23.96
2014-15	31.86	25.29	41.32	22.45	22.73
2015-16	21.37	20.75	34.90	21.04	18.75
2016-17	31.49	27.80	38.05	20.70	22.61
2017-18	32.52	31.00	41.50	22.85	23.87
2018-19	32.00	31.38	50.71	24.31	20.44
2019-20	28.85	31.28	52.79	21.93	32.62
2020-21	27.76	32.23	52.75	20.39	27.49
2021-22	30.14	38.46	60.23	22.37	27.32
Mean	**30.036**	**28.710**	**44.955**	**20.440**	**23.655**
SD	**4.046**	**4.870**	**7.919**	**4.668**	**4.290**
C.V.(%)	**13.470**	**16.962**	**17.615**	**22.836**	**18.137**
CAGR(%)	**1.870%**	**3.402%**	**3.770%**	**9.468%**	**5.114%**

Sources: Annual reports of companies

Table 3 shows the Return on Capital Employed (ROCE) ratio for selected Information Technology (IT) companies in India during the study period from 2011-12 to 2021-22. ROCE is a financial ratio that measures the efficiency and profitability of a company's capital investments.

The mean ROCE for the selected IT companies during the study period ranges from 20.440% to 44.955%, with TCS having the highest mean ROCE and Tech. Mahindra Ltd. has the lowest. The standard deviation (SD) for each company's ROCE shows the degree of variation from the mean, with TCS having the highest SD and HCL Technologies having the lowest.

The coefficient of variation (C.V.) is a measure of the SD relative to the mean, and it ranges from 13.470% to 22.836%, with Tech. Mahindra Ltd. has the highest C.V. and HCL Technologies has the lowest. This indicates that Tech. Mahindra Ltd. has the most variable ROCE compared to its mean, while HCL Technologies has the most consistent ROCE.

The compound annual growth rate (CAGR) for each company's ROCE during the study period ranges from 1.870% to 9.468%, with Tech. Mahindra Ltd. has the highest CAGR and HCL Technologies has the lowest. This shows the annual growth rate of each company's ROCE during the study period.

Overall, the data suggest that TCS had the highest mean ROCE among the selected IT companies, while Tech. Mahindra Ltd. had the highest CAGR %. However, Tech. Mahindra Ltd. also had the highest C.V. %, indicating more variability in their ROCE. It is important to note that other financial and non-financial factors should also be considered when evaluating the performance of a company.

Analysis of Variance (ANOVA) in Return on Capital Employed Ratio During the study period 2011-12 to 2021-22

Source of Variation	Sum of Square SS	d.f.	Mean Sum of Square	F-Ratio *	P-Value
Between FY	SSR = 689.7256	r-1 =10	MSR = 68.9726	F1 = 3.7275	0.0014
Between Companies	SSC = 3916.0825	c-1 =4	MSC =979.0206	F2 =52.9089	0.0000
Error (residual)	SSE =740.1562	(r-1) (c-1) =40	MSE = 18.5039		
Total	SST = 5345.9643	rc-1 =54			

Note: * Indicates 5 percent level of significance.
Source: Computed.

The test result indicates that the critical value of F for between financial year F (10,40) at 0.05 level of significance =2.0772 As calculated F1=3.7275>2.0772 So, H_0 is rejected, hence there is significant differentiating between financial years as well as the critical value F for between IT companies F (4,40) at 0.05 level of significance=2.606 As calculated F2=52.9089>2.606 So, H0 is rejected, hence there is significant differentiating between companies. It may be concluded that there is intra-company variation in the Return on Capital Employed Ratio of all financial years and inter-company variation also arises during the study period.

- **Return on Total Assets (ROTA):** ROTA is a profitability ratio that measures a company's ability to generate earnings from its total assets. It is calculated by dividing net income by total assets. A higher ROTA indicates a company is generating more profits per unit of assets, which is positive for financial health. It is an important financial ratio for investors and analysts but should be considered alongside other financial ratios and factors such as industry standards and trends, economic conditions, and the company's specific business model and strategies.

Table 4

H_0: There is no significant difference in the Return on Total Assets Ratio of selected Indian IT Companies.

Year	Company				
	HCL Technologies	Infosys Ltd.	TCS	Tech. Mahindra Ltd.	Wipro Ltd.
2011-12	17.93	23.64	32.03	7.25	12.13
2012-13	23.21	21.18	29.72	8.98	13.88
2013-14	27.43	19.33	32.07	18.22	16.15
2014-15	25.47	19.67	30.53	13.25	15.34
2015-16	17.74	17.45	29.8	15.59	13.91
2016-17	21.23	17.29	26.35	12.84	12.96

2017-18	22.43	21.29	27.72	14.92	13.16
2018-19	21.85	18.62	30.21	14.43	12.36
2019-20	16.75	19.17	31.68	14.95	13.29
2020-21	15.79	19.21	28.3	12.7	15.3
2021-22	20.35	21.36	31.49	14.03	15.09
Mean	20.925	19.837	29.991	13.378	13.961
SD	3.669	1.884	1.879	3.039	1.333
C.V.(%)	17.536	9.496	6.265	22.719	9.551
CAGR(%)	1.417%	-1.121%	-0.189%	7.611%	2.456%

Sources: Annual reports of companies

Table 4 shows the Return on Total Assets (ROTA) ratio for selected Information Technology (IT) companies in India during the study period from 2011-12 to 2021-22. ROTA is a financial ratio that measures how effectively a company is using its assets to generate profits.

The mean ROTA for the selected IT companies during the study period ranges from 13.378% to 29.991%, with TCS having the highest mean ROTA and Tech. Mahindra Ltd. has the lowest. The standard deviation (SD) for each company's ROTA shows the degree of variation from the mean, with HCL Technologies having the highest SD and Infosys Ltd. having the lowest.

The coefficient of variation (C.V.) is a measure of the SD relative to the mean, and it ranges from 6.265% to 22.719%, with Tech. Mahindra Ltd. has the highest C.V. and TCS has the lowest. This indicates that Tech. Mahindra Ltd. has the most variable ROTA compared to its mean, while TCS has the most consistent ROTA.

The compound annual growth rate (CAGR) for each company's ROTA during the study period ranges from -1.121% to 7.611%, with Tech. Mahindra Ltd. has the highest CAGR and Infosys Ltd. has a negative CAGR. This shows the annual growth rate of each company's ROTA during the study period.

Overall, the data suggest that TCS had the highest mean ROTA among the selected IT companies, while Tech. Mahindra Ltd. had the highest CAGR %. However, Tech. Mahindra Ltd. also had the highest C.V., indicating more variability in their ROTA. It is important to note that other financial and non-financial factors should also be considered when evaluating the performance of a company.

Analysis of Variance (ANOVA) in Return on Total Assets Ratio During the study period 2011-12 to 2021-22

Source of Variation	Sum of Square SS	d.f.	Mean sum of Square	F-Ratio *	P-Value
Between FY	SS_R = 86.6505	r-1 =10	MS_R = 8.6651	F_1 = 1.5139	0.1703
Between Companies	SS_C = 1983.2204	c-1 =4	MS_C =495.8051	F_2 =86.6237	0.0000
Error (residual)	SS_E =228.9467	(r-1) (c-1) =40	MS_E = 5.7237		
Total	SS_T = 2298.8177	rc-1 =54			

Note: * Indicates 5 percent level of significance.
Source: Computed.

The test result indicates that the critical value of F for between financial year F (10,40) at 0.05 level of significance =2.0772 As calculated F1=1.5139 <2.0772 So, H0 is accepted, hence there is no significant differentiating between financial years whereas the critical value F for between IT companies F (4,40) at 0.05 level of significance=2.606 As calculated F2=86.6237>2.606 So, H0 is rejected, hence there is significant differentiating between companies. It may be concluded that there is no intra-company variation in the Return on Total Assets Ratio of all financial years and inter-company variation arises during the study period.

- **Return on Net Worth (RONW):** RONW is a ratio that measures a company's ability to generate income from shareholder's equity. It is calculated by dividing the net income of a company by its shareholder's equity. A high RONW ratio indicates that a company is generating a high return on equity investment made by shareholders. This ratio is used by investors and analysts to evaluate a company's financial performance.

Table 5

H_0: There is no significant difference in the Return on Net Worth Ratio of selected Indian IT Companies.

Year	Company				
	HCL Technologies	**Infosys Ltd.**	**TCS**	**Tech. Mahindra Ltd.**	**Wipro Ltd.**
2011-12	29.53	28.46	44.33	13.37	19.23
2012-13	36.20	25.28	39.38	15.6	23.31
2013-14	38.00	24.21	41.93	31.26	25.16
2014-15	32.70	25.3	42.40	20.04	23.66
2015-16	21.95	20.78	35.49	23.74	19.89
2016-17	26.46	20.31	30.31	18.04	17.45
2017-18	26.70	25.44	33.27	20.46	18.27
2018-19	26.88	23.44	38.10	21.21	15.41
2019-20	24.04	24.97	44.72	20.35	18.68
2020-21	20.07	25.23	41.39	16.94	22.23
2021-22	25.53	30.63	49.48	19.00	22.32
Mean	28.005	24.914	40.073	20.001	20.510
SD	5.641	2.947	5.530	4.691	3.023
C.V.(%)	20.144	11.830	13.799	23.456	14.739
CAGR(%)	-1.604%	0.820%	1.229%	3.982%	1.669%

Sources: Annual reports of companies

Table 5 represents the Return on Net Worth or Shareholders Fund Ratio (RONW) of five selected Information Technology (IT) companies in India for the study period of 2011-12 to 2021-22. RONW is a measure of a company's efficiency in generating profits from the funds invested by its shareholders. Among the selected companies, TCS has the highest Mean RONW of 40.073%, indicating that it is the most efficient in generating profits from shareholders' funds. HCL Technologies comes next with a mean RONW of 28.005%, followed by Infosys Ltd. with a mean RONW of 24.914%. Tech. Mahindra Ltd. and Wipro Ltd. have lower mean RONW of 20.001% and 20.510%, respectively.

The standard deviation (SD) shows the degree of variation in the RONW data. A lower SD value indicates that the data is less variable, and vice versa. The SD values for the selected companies are moderate, ranging from 2.947% for Infosys Ltd. to 5.641% for HCL Technologies.

The coefficient of variation (CV) is a measure of relative variability, calculated as the ratio of SD to the mean RONW. It is expressed as a percentage, and a lower CV indicates lower variation. Infosys Ltd. has the lowest CV of 11.830%, indicating that its RONW data is less variable. In contrast, Tech. Mahindra Ltd. has the highest CV of 23.456%, indicating higher variability in its RONW data.

The compounded annual growth rate (CAGR) indicates the annual growth rate of RONW over the study period. Tech. Mahindra Ltd. has the highest CAGR of 3.982%, which indicates that it has shown the highest growth in RONW over the study period. On the other hand, HCL Technologies has a negative CAGR% of -1.604%, which implies a decline in RONW over the study period. The other selected companies have CAGR values ranging from 0.820% for Infosys Ltd. to 1.669% for Wipro Ltd.

The data shows that TCS has the highest mean RONW among the selected companies, indicating that it is the most efficient in generating profits from shareholders' funds. However, Tech. Mahindra Ltd. has shown the highest growth rate in RONW over the study period. The data also indicates moderate variability in the RONW data of the selected companies, with Infosys Ltd. having the least variable data and Tech. Mahindra Ltd. has the most variable data.

Analysis of Variance (ANOVA) in Return on Net Worth Ratio During the study period 2011-12 to 2021-22

Source of Variation	**Sum of Square SS**	**d.f.**	**Mean sum of Square**	**F-Ratio ***	**P-Value**
Between FY	SS_R = 371.798	r-1 = 10	MS_R = 37.1798	F_1 = 2.2859	0.0314
Between Companies	SS_C = 2936.1096	c-1 = 4	MS_C = 734.0274	F_2 =45.1305	0.0000
Error (residual)	SS_E =650.5824	(r-1) (c-1) =40	MS_E = 16.2646		
Total	SS_T = 3958.4901	rc-1 =54			

Note: * Indicates 5 percent level of significance.
Source: Computed.

The test result indicates that the critical value of F for between financial year F (10,40) at 0.05 level of significance =2.0772 As calculated F1=2.2859>2.0772 So, H0 is rejected, hence there is significant differentiating between financial years as well as the critical value F for between IT companies F (4,40) at 0.05 level of significance=2.606 As calculated F2=45.1305>2.606 So, H0 is rejected, hence there is significant differentiating between companies. It may be concluded that there is intra-company variation in the Return on Net Worth or Shareholders Fund Ratio of all financial years and inter-company variation also arises during the study period.

- **Earnings Per Share (EPS):** It is a financial ratio that shows the amount of net profit earned by a company on a per-share basis. It is calculated by dividing the total net profit of a company by the total number of outstanding shares. EPS is an important measure of a company's profitability, and it is often used by investors to evaluate the financial health and growth potential of a company. Higher EPS values indicate that a company is generating more profits per share, which can be a positive sign for investors. However, EPS should be analyzed along with other financial ratios and indicators to get a comprehensive understanding of a company's financial performance

Table 6

H_0: There is no significant difference in the Earnings Per Share (EPS) of selected Indian IT Companies.

Year	Company				
	HCL Technologies	Infosys Ltd.	TCS	Tech. Mahindra Ltd.	Wipro Ltd.
2011-12	28.23	147.51	55.95	36.27	19.13
2012-13	53.32	158.76	65.22	51.10	23.03
2013-14	85.66	178.39	94.15	115.49	30.09
2014-15	45.17	105.91	98.31	23.58	33.38
2015-16	33.52	55.26	117.11	33.40	33.38
2016-17	48.18	60.16	120.04	31.37	33.61
2017-18	52.54	71.28	131.15	40.84	16.26
2018-19	59.69	33.66	79.34	44.58	12.67
2019-20	33.06	36.34	88.64	46.89	14.88
2020-21	32.22	42.37	82.78	43.76	17.81
2021-22	40.10	50.27	103.24	50.48	22.20
Mean	46.517	85.446	94.175	47.069	23.313
SD	16.501	53.124	23.112	24.222	7.987
C.V.(%)	35.473	62.172	24.541	51.460	34.259
CAGR(%)	3.977%	-11.273%	7.044%	3.741%	1.667%

Sources: Annual reports of companies

Table 6 represents the Earnings Per Share (EPS) Ratio of five selected Information Technology (IT) companies in India for the study period of 2011-12 to 2021-22. EPS is a measure of a company's profitability per share of its outstanding common stock. Among the selected companies, TCS has the highest mean EPS of 94.175, indicating that it has the highest profitability per share. Infosys Ltd. comes next with a mean EPS of 85.446, followed by HCL Technologies with a mean EPS of 46.517. Tech. Mahindra Ltd. and Wipro Ltd. have lower mean EPS of 47.069 and 23.313, respectively. The standard deviation (SD) shows the degree of variation in the EPS data. The SD values for the selected companies are high, ranging from 7.987 for Wipro Ltd. to 53.124 for Infosys Ltd.

The coefficient of variation (CV) is a measure of relative variability, calculated as the ratio of SD to the mean EPS. It is expressed as a percentage, and a higher CV indicates higher variation. Infosys Ltd. has the highest CV of 62.172%, indicating that its EPS data is highly variable. Tech. Mahindra Ltd. also has a high CV of 51.460%. In contrast, TCS has the lowest CV of 24.541%, indicating lower variation in its EPS data.

The compounded annual growth rate (CAGR) indicates the annual growth rate of EPS over the study period. TCS has the highest CAGR of 7.044%, which indicates that it has shown the highest growth in EPS over the study period. On the other hand, Infosys Ltd. has a negative CAGR of -11.273%, which implies a decline in EPS over the study period. The other selected companies have CAGR values ranging from 1.667% for Wipro Ltd. to 3.977% for HCL Technologies.

The data shows that TCS has the highest mean EPS among the selected companies, indicating that it has the highest profitability per share. However, Infosys Ltd. has highly variable EPS data, while TCS has lower variability. TCS has also shown the highest growth rate in EPS over the study period. The data also indicates moderate variability in the EPS data of HCL Technologies and Wipro Ltd.

Analysis of Variance (ANOVA) in Earnings Per Share Ratio During the study period 2011-12 to 2021-22

Source of Variation	Sum of Square SS	d.f.	Mean sum of Square	F-Ratio *	P-Value
Between FY	SS_R = 12845.562	r-1 = 10	MS_R = 1284.5562	F_1 = 1.7159	0.1107
Between Companies	SS_C = 38588.0729	c-1 = 4	MS_C = 9647.0182	F_2 =12.8862	0.0000
Error (residual)	SS_E =29945.2281	(r-1) (c-1) =40	MS_E = 748.6307		
Total	SS_T = 81378.8629	rc-1 =54			

Note: * Indicates 5 percent level of significance.
Source: Computed.

The test result indicates that the critical value of F for between financial year F (10,40) at 0.05 level of significance =2.0772 As calculated F1=1.7159 <2.0772 So, H0 is accepted, hence there is no significant differentiating between financial years whereas the critical value F for between IT companies F (4,40) at 0.05 level of significance=2.606 As calculated F2=12.8862>2.606 So, H0 is rejected, hence there is significant differentiating between companies. It may be concluded that there is no intra-company variation in the Earnings Per Share Ratio of all financial years and inter-company variation arises during the study period.

Results and Findings

- The overall situation regarding the gross profit ratio is better in HCL Technologies, Tech. Mahindra, and Wipro Ltd and the situation is alarming in TCS and Infosys Ltd because the average gross profit ratio of these companies is below the industry average. This shows that HCL Technologies, Tech. Mahindra and Wipro Ltd are good at making profits and Infosys Ltd and TCS need to decrease the cost of goods sold during the period of the study.
- The mean of net profit indicates that there was a low level of deviation in the ratio from the mean value of all the companies except Tech Mahindra, in such case the deviation level is moderate. Profitability in terms of the net profit ratio of TCS, Infosys, and HCL is good and it was low in the case of Tech Mahindra. Only Infosys and TCS reported negative CAGR during the study period.
- TCS had the highest mean ROCE among the selected IT companies, while Tech. Mahindra Ltd. had the highest CAGR %. However, Tech. Mahindra Ltd. also had the highest C.V. %, indicating more variability in their ROCE. It is important to note that other financial and non-financial factors should also be considered when evaluating the performance of a company.
- The data suggest that TCS had the highest mean ROTA among the selected IT companies, while Tech. Mahindra Ltd. had the highest CAGR %. However, Tech. Mahindra Ltd. also had the highest C.V., indicating more variability in their ROTA. It is important to note that other financial and non-financial factors should also be considered when evaluating the performance of a company.
- The TCS has the highest mean EPS among the selected companies, indicating that it has the highest profitability per share. However, Infosys Ltd. has highly variable EPS data, while TCS has lower variability. TCS has also shown the highest growth rate in EPS over the study period. The data also indicates moderate variability in the EPS data of HCL Technologies and Wipro Ltd.
- HCL Technology and Infosys Ltd. have also shown a strong return on investment ratios, with their return on total assets (ROTA) and Return on Net Worth or Shareholders Fund (RONW) consistently above the industry average. This indicates the company's ability to generate profits from its assets and shareholders' investments.

Conclusion

The IT industry has played a pivotal role in India's development and has made a substantial contribution to its GDP. The sector has witnessed growth of 7.7%, and exports have increased by almost 15% in the past year. Major companies with the highest market capitalization, such as Infosys, Wipro, HCL, Tech Mahindra, and TCS, have experienced significant growth and development over the years. This study measures the profitability analysis of these companies from 2011-12 to 2021-22, using profitability ratios based on sales revenue and return on investment. The analysis involved assessing various profitability ratios such as gross profit margin, net profit margin, return on capital employed (ROCE), return on total assets (ROTA), and return on net worth (RONW). These ratios provide insights into the profitability, financial health, and efficiency of the companies in generating profits from their operations. Overall, the profitability analysis suggests that the IT sector has demonstrated strength and soundness over the years, which is valuable information for investors, lenders, and other stakeholders in evaluating the financial viability and potential of the sector.

References

1. Mondal, S. K., & Pal, P. (2021). A Research Study on Profitability Analysis: A Key Feature for Company's Financial Performance with Special Reference to Selected Oil Companies in India. Journal of Accounting and Finance in Emerging Economies, 7(1), 28-39.
2. Kusumawati, E., Wijaya, T. T., & Murdiati, S. (2020). Profitability Ratio Analysis as a Measurement Tool for Financial Performance: Study Case of PT Pertamina (Persero). Journal of Applied Accounting and Taxation, 2(2), 98-105.
3. Puttann K. (2014) "Performance Analysis of Information Technology Sector in India." International Journal of Economic and Business Review, 2(3) pp. 1-7.
4. Vineet Singh. (2016) "Analysing Profitability of Indian IT Giants: A Case Study of TCS and WIPRO", International Journal of Advanced Research in Management (IJARM), Vol. 7, No-3, pp 63-70.
5. Mahendra Maisuria and Idrish Allad. (2016). "Profitability Ratio Analysis of Selected Indian IT Companies: A Comparative Study", International Multidisciplinary E-Journal, Vol. 5, No. 2, pp 207-220.
6. Bhatt R. (2012). "Profitability Ratio Analysis with Specific Reference to Indian Petroleum Industry- An Empirical Analysis." Indian Journal of Accounting, XLIII (1), pp. 71-77

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