# An Upgrade to Green Finance: A study on the Financial Performance of Indian companies that prioritize Sustainability.

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by


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# DECLARATION

I hereby declare that the data presented in this Dissertation report entitled, "**An Upgrade to Green Finance: A study on the Financial Performance of Indian companies that prioritize Sustainability.**" is based on the results of investigations carried out by me in the Master's Degree in the Discipline MBA (Financial Services) at the Goa Business School, Goa University under the Mentorship of Dr.Pinky Pawaskar (Assistant Professor) and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will be not be responsible for the correctness of observations / experimental or other findings given the dissertation.

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**CERTIFICATE**

This is to certify that the dissertation report "An **Upgrade to Green Finance: A study on the Financial Performance of Indian companies that prioritize Sustainability".** is a bonafide work carried out by Ms. Neha Naresh Gadekar under my mentorship in partial fulfilment of the requirements for the award of the degree of Master's Degree in the Discipline MBA (Financial Services) at the Goa Business School, Goa University.

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| | LIST OF ABRIVATION |
|---|---|
| ROE | Return on Net worth/Equity (%) |
| ROCE | Return on Capital Employed (%) |
| ROA | Return on Assets (%) |
| IT | Information Technology |
| FY | Financial Year |

# CHAPTER 1: INTRODUCTION

## *1.1 Introduction*

Sustainability has become a crucial factor in business operations worldwide. In India, the concept of Socially responsible investing (SRI)has been popular only during the past few years. SRI is concluded to be an investment strategy that aims to generate social change as well as gain financial returns for an investor. An investment avenue that can include companies that are following Corporate Social Responsibility (CSR) guidelines by making a positive sustainable impact or those as simple as a solar energy efficient company and doesn't include the companies making a negative impact. Due to the given rise in the concept of sustainability, ESG investing is a potential investment avenue for investors. And has already gained momentum specially in India, where larger companies are focusing greater and have kept a part of their funds to act for Environmental and Social responsibility.
During the last four decades, all international organizations have shown burgeoning concern for environment protection and social responsibility to be fulfilled by stakeholders of society. Amid this, notions like social responsibility and initial conversation regarding social values gained momentum (Vishal Vyas,2020)

Companies that prioritize sustainability or would be moving towards this positive impact are expected to generate long-term value for shareholders by addressing social, economic, and environmental risks that could impact the company's financial performance.
Therefore, this study aims to analyze the financial performance of Indian companies that prioritize sustainability through ESG funds and the financial performance indicators

## *1.2 Meaning, Scope and Importance*

The study aims to examine the relationship between financial performance and ESG indicators of Indian Companies that consider sustainability an important part of their terms & policy making. The study explores the major factors that drive sustainable practices in Indian companies and the potential benefits that sustainability can bring to the Indian economy.

To achieve this objective, this study employs a quantitative research methodology. The sample of companies is drawn from the Nifty100 ESG index, which represents the top companies listed on the National Stock Exchange prioritizing sustainability. Appropriate data on the sustainability of the company based on its ESG score and 5 years financial data such as Return on Equity (ROE), Return on Capital Employed (ROCE), Return on Assets (ROA) and Net profit is collected for each company in the sample.
The Top rated ESG companies are then divided into two broad sectors; IT and Financial Services for deeper analysis.
The data collected is analysed using statistical methods such as regression analysis, t-tests or ANOVA. The analysis examines the relationship between sustainability practices and financial performance particularly focusing on the impact of specific sustainability practices on financial performance.

The findings of this study shall contribute to the literature on sustainability and financial performance in emerging economies, particularly India. It will also be beneficial in understanding the relationship between sustainability and financial performance in the Indian context and identify the factors that drive sustainable practices in Indian companies. The conclusions drawn through this study will also provide insights into the potential benefits that sustainability can bring to the Indian economy such as job creation, improved environmental quality and enhanced social welfare.
The study will be of interest to academics, policymakers, potential as well as existing investors and business leaders who are interested in understanding the role of sustainability in driving economic growth and development in emerging economies. The findings of this study will be relevant not only to Indian companies but also to businesses in other emerging economies that are grappling with the challenges of sustainability and seeking to create long-term value for their stakeholders.

In conclusion, this study aims to fill a research gap by examining the financial performance of Indian companies that prioritize sustainability.

## *1.3 Literature Review*

Sustainability and ESG are a huge trend in the financial world.

**ESG**

The acronym (ESG) stands for Environmental (E), Social (S), and Governance (G). It's a set of standards for a company's socially conscious behavior. Investors in the Indian stock market are also increasingly conscious about ESG companies and trend's investment funds have exploded all around the world. In 2019 ESG funds were estimated to hold over US$ 17 trillion in assets. Industry estimates forecast ESG assets to exceed US$ 50 trillion in 2025. **Table.1** provides a comprehensive review of the studies conducted on sustainability reporting with varied financial reporting measures.

This literature review aims to provide an overview of the existing literature on the financial performance of Indian companies that prioritize sustainability and the potential benefits of green finance in India. Several studies have examined the relationship between sustainability and financial performance in Indian companies.

A study by (Ray & Mitra, 2018) examined the impact of prior financial results on CSR activities of top Indian companies and concluded that there is a strong long-term relationship between the financial performance and social achievement of large companies.Another study by (Coelho et al., 2023) stated similar findings that CSR directly impacts a company's financial performance, and this impact becomes more significant as the company's environmental, social, and governance (ESG) scores improve based on world's largest stock market indices, mutual funds, sustainable portfolios, non-sustainable portfolios, regions, asset classes for ESG investing, emerging markets and so on.

(Lassala et al., 2021) study from the United Nations concluded that firms should adopt business models that are necessary to embrace the SDGs (Sustainability Development Goals) because sustainability-based models can ensure not only the present but also the future of generations to come.

A study by (Sharma et al., 2020) found that Indian companies with high levels of environmental, social and governance (ESG) performance outperformed those with low ESG performance in terms of profitability and market value. The study also found that companies with strong ESG performance had lower financial risk and higher credit ratings, suggesting that sustainability can be a source of competitive advantage for Indian companies.

In the financial sector, a study by Dangayach and Bhatnagar (2019) examined the role of green banking in promoting sustainable development in India. The study found that green banking practices such as lending to renewable energy projects, financing energy-efficient buildings, and promoting sustainable agriculture can contribute to the achievement of sustainable development goals while also improving the financial performance of banks. Whereas , an ancient study by (Jha & Rangarajan, 2020) proved that the relationship between corporate sustainability performance (CSP) and corporate firm performance (CFP) has an adverse impact on CSP-CFP linkage in both cases, which means that Indian firms don't get the financial performance benefits of investments done for sustainability

Finally , A study done by (Goel & Misra, 2017) proved significantly that the relationship between the financial performance and sustainability score was inconsistent across different financial measures.

## *1.3.a Research Gap*

While there has been some research on the financial performance of Indian companies that prioritize sustainability, with the reference of literature review there are several research gaps that need to be addressed. Some of the major research gaps include:

1. Limited research on specific sectors: While there have been some studies on the relationship between sustainability and financial performance of Indian companies, most of them have focused on the manufacturing and energy related sectors. There is a need for research in other sectors such as financial services, Information Technology, agriculture and so on.

2. Revise in the measures of sustainability: The variables related to Sustainability have seen to be repetitive that commonly includes measure related to companies CSR activities, waste management, renewable energy and voluntary CSR disclosures related of sustainable practices.
3. Conclusions on the studies are not based primarily on the financial performance: Literature tends to majorly highlight the sustainability factors to conclude the results and suggestions. where, the purpose of financial performance indicators tends to fade in determining the final outcome which should result in favour of investors based on returns thus contributing to sustainability
4. Study on Limited time frame: Limited availability of data on the recent years has led to missing of analysis on the current years specially on the years 2021 and 2022 in the Indian Context.

Addressing these research gaps could help provide a better understanding of the relationship between sustainability and financial performance in the Indian context, which could be useful for both companies and potential investors.

## *1.3.b Data to be used for the study*

The data for the study measures the Financial Performance of Top ESG rated Indian companies listed on Nifty100 ESG from which the top ESG rated Indian companies are chosen and rated based on various parameters by Credit Rating Information Services of India Limited (CRISIL) being a sustainability variable; sectoral comparison focusing majorly on the financial services and Information Technology companies for niche focused study.
To measure financial performance, accounting ratios such as ROE (Return on Equity), ROCE (Return on Capital Employed), Return on Assets (ROA) and Net profit are to be used (source: moneycontrol.com) whereas sustainability variables include ESG Score rating (source: ESG rating agency CRISIL)

financial performance indicators that are used in the study include;

1. Return on Equity (ROE): These measures how much profit a company generates for each unit of shareholder equity. It is calculated by dividing net income by shareholder equity.

2. Return on Capital Employed (ROCE): This is a profitability ratio that measures how efficiently a company is using its capital to generate profits.

3. Return on assets (ROA): This measures the company's ability to generate profits from its assets.

4. Net Profit: This is calculated by subtracting the cost of goods sold (COGS) from the total revenues. It is the financial gain of the company. It measures the company's profitability after accounting for all expenses.

CRISIL'S ESG Risk assessment methodology

The evaluation is purely based on publicly available information released by companies through websites, annual reports, investor presentations, sustainability reports, Carbon Disclosure Project Filings and so on.

The final ESG score is determined by CRISIL by allocating relevant weights to ESG; E (35%), S (25%), G (40%) to arrive at the final relative score. Further, the companies are scored on a scale of 0-100 where 100 is the highest. It is also believed by the agency that Governance of a company is what drives E&S at companies and hence is given the highest weightage.

## *1.3.c Techniques for data analysis*

The techniques used for the study to measure financial performance of Indian companies that prioritize sustainability using the above variables are mainly;

i. Regression analysis: Regression analysis used to identify the relationship between sustainability measures and financial performance measures. Helpful in determining if ESG ratings as a factor strongly associate with financial performance, and used to make predictions about how changes in sustainability practices will affect financial performance.

This includes usage of various models such as least square model, two stage least square model, GMM model, Model Diagnosis test and Ramsey Reset Test.

ii. Content analysis: Content analysis is used to analyse financial reports of Indian companies to identify measures of financial performance also a brief study into the insights This can provide insights into the strategies that companies are using to achieve their sustainability objectives.

In conclusion, the existing literature suggests that sustainable practices can contribute to the financial performance of Indian companies while promoting sustainable development in India. The findings of this literature review provide a strong rationale for conducting an empirical study on the financial performance of Indian companies that prioritize sustainability and the potential benefits of green finance in India.

## *1.4 Objectives of the study*

The main objective of the study is to analyse the financial performance of companies that prioritize sustainability. The specific objectives are:

1. To evaluate the financial performance of listed companies in India having high ESG score to that with low ESG Score.
2. To determine the relationship between sustainability and financial performance indicators such ROE (Return on Equity), ROCE (Return on Capital Employed), Return on Assets (ROA) and Net profit.

## *1.5 Methodology*

The research used a quantitative method to analyse the financial performance of companies that prioritize sustainability. The research analysed the financial data of the companies listed on the Nifty100 ESG index with high ESG ratings. The ESG ratings of the top Financial Services and IT Indian companies on the Nifty100 ESG index were analysed using the CRISIL ESG Fundamentals database. The data for financial performance was collected from the companies' financial statements from 2018-2022 and financial database Money control.

### *Period of Study*

The data for financial performance was collected for the year 2018-2022 to ensure consistency in the data collection process. The data was analysed using statistical software, and the results were presented in tables, charts, and graphs.

### *Data source*

This research used secondary data obtained from two sources:

1. CRISIL ESG Fundamentals database - to collect ESG ratings for the top IT and Financial Services Sectors Indian companies on the Nifty100 ESG index.
2. Financial Database- To collect ROE, ROA, ROCE and Net Profit data for the companies

The data collected for the study is then divided into two major sectors namely, Information Technology (IT) and Financial Services and then analysed

The statistical analysis is conducted using descriptive statistics to summarize the data and to determine the relationship between sustainability and financial performance. Specifically, a t-test, P value test is used to test the difference between the means of the financial performance indicators of the top companies with high ESG rating. Additionally, a correlation analysis is conducted to determine the relationship between sustainability and financial performance indicators.

The content analysis separates the companies by their significant contribution towards environmental, social and community involvement services. Accordingly, A study by stated that 59 companies' director's report mentioned the company's active engagement in voluntary CSR activities. The rest 41 sample companies are not involved in such activities significantly out of the 100 from NIfty100 ESG index.

## *Models used for the study*

### LEAST SQUARE MODEL

The least square model is a statistical technique used to estimate the relationship between two or more variables based on the principle of minimizing the sum of squared errors between the observed and predicted values.
In the context of studying the financial performance of companies that prioritize sustainability, the least square model is used to identify the key drivers of financial performance and evaluate the impact of sustainability practices on financial outcomes. By identifying the sustainability practices that have the strongest impact on financial performance, companies can prioritize their sustainability efforts and investors can make informed decisions about which companies are most likely to deliver long-term financial returns.

The outcome of a least square model includes the estimated coefficients of the independent variables, which indicate the strength and direction of their relationship with the dependent variable, as well as the goodness-of-fit measures, such as the R-squared value, which indicate how well the model fits the data.
The least square model is estimated using statistical software E-views, which provides the estimated coefficients of the independent variables, as well as the goodness-of-fit measures. The software will estimate the coefficients of the independent variables based on the data and the specified model, and provide information such as the standard errors, t-values, and p-values for each coefficient.

The estimated coefficients of the independent variables in the least square model are to be interpreted as follows:

- The sign of the coefficient indicates the direction of the relationship between the independent variable and the dependent variable. A positive coefficient indicates a positive relationship (i.e., as the independent variable increases, the dependent variable increases), while a negative coefficient indicates a negative relationship (i.e., as the independent variable increases, the dependent variable decreases).
- The magnitude of the coefficient indicates the strength of the relationship between the independent variable and the dependent variable. A larger coefficient indicates a stronger relationship.
- The p-value of the coefficient indicates the statistical significance of the relationship between the independent variable and the dependent variable. A p-value less than 0.05 is typically considered statistically significant, indicating that the relationship between the independent variable and the dependent variable is unlikely to be due to chance.
- The goodness-of-fit measures, such as the R-squared value, can also be used to interpret the outcome of the least square model. The R-squared value indicates the proportion of the variance in the dependent variable that is explained by the independent variables. A higher R-squared value indicates a better fit of the model to the data, and suggests that the independent variables are good predictors of the dependent variable.

Overall, the outcome of a least square model is interpreted by examining the estimated coefficients of the independent variables, their signs, magnitudes, and statistical significance, as well as the goodness-of-fit measures such as the R-squared value. These interpretations can provide insights into the relationship between the independent variables and the dependent variable, and inform decision-making such as investment decisions or policy decisions.
The main purpose of the least square model is to provide a quantitative framework for analysing the relationship between variables and making predictions based on that relationship. By estimating the coefficients of the independent variables, the model can provide insights into which variables have the strongest impact on the dependent variable and how they are related. This information is used to inform decision-making, such as investment decisions, policy decisions, or business strategy.
Overall, the least square model is a powerful tool for analysing the relationship between sustainability practices and financial performance, and can provide valuable insights for companies and investors alike.

## TWO STAGE LEAST SQUARE MODEL

The two-stage least squares (2SLS) model is a statistical technique used to estimate the relationship between two or more variables in the presence of endogeneity, which occurs when the independent variables are correlated with the error term. In the context of studying the financial performance of companies that prioritize sustainability, the 2SLS model is used to address the endogeneity problem and evaluate the impact of sustainability practices on financial outcomes.

The significance of the 2SLS model in studying the financial performance of sustainable companies lies in its potential to provide a more accurate and reliable assessment of the impact of sustainability practices on financial outcomes. By addressing the endogeneity problem and estimating the coefficients of the independent variables, the 2SLS model can provide insights into which sustainability practices have the strongest impact on financial performance and inform investment decisions and corporate strategy.

The outcomes of the 2SLS model include the estimated coefficients of the independent variables, which indicate the strength and direction of their relationship with the dependent variable, as well as the goodness-of-fit measures, such as the R-squared value, which indicate how well the model fits the data.
The purpose of the 2SLS model is to provide a more accurate and reliable framework for analysing the relationship between sustainability practices and financial performance, by addressing the endogeneity problem and estimating the impact of sustainability practices on financial outcomes.

The outcome of the two-stage least squares (2SLS) model is estimated through a two-stage process. In the first stage, instrumental variables are used to estimate the endogenous independent variables. In the second stage, the estimated values of the endogenous independent variables are used to estimate the coefficients of the independent variables and evaluate their impact on the dependent variable.

The estimated coefficients of the independent variables in the second stage are interpreted in the same way as in a standard linear regression model. Specifically, the coefficient estimates indicate the strength and direction of the relationship between the independent variable and the dependent variable, holding other variables constant.

- A positive coefficient indicates a positive relationship between the independent variable and the dependent variable, while a negative coefficient indicates a negative relationship.
- The statistical significance of the coefficient estimates is evaluated using hypothesis testing. Specifically, the null hypothesis is that the coefficient is zero, indicating that there is no relationship between the independent variable and the dependent variable. The alternative hypothesis is that the coefficient is not zero, indicating that there is a significant relationship between the independent variable and the dependent variable. The p-value associated with the coefficient estimate is used to determine whether to reject or fail to reject the null hypothesis.

- In addition to the coefficient estimates, the goodness-of-fit measures, such as the R-squared value, is used to evaluate how well the model fits the data. The R-squared value indicates the proportion of the variation in the dependent variable that is explained by the independent variables in the model. A higher R-squared value indicates a better fit of the model to the data.

Overall, the interpretation of the outcome of the 2SLS model is similar to that of a standard linear regression model the 2SLS model is a powerful tool for analysing the relationship between sustainability practices and financial performance, and can provide valuable insights for companies and investors in the sustainable finance space.

**GMM MODEL**

The Generalized Method of Moments (GMM) model is a statistical technique used to estimate the parameters of a model by using the moments of the data. The GMM model is particularly useful when the assumptions of the traditional least squares model are not met, such as when the errors are not normally distributed or when there are endogeneity or measurement errors.

In the context of studying the financial performance of companies that prioritize sustainability, the GMM model is used to identify the key drivers of financial performance and evaluate the impact of sustainability practices on financial outcomes. The GMM model can incorporate multiple sources of data, such as financial statements, sustainability reports, and external market data, to provide a more comprehensive analysis of the relationship between sustainability practices and financial performance.

By identifying the sustainability practices that have the strongest impact on financial performance and estimating their effects, the GMM model can help companies and investors prioritize their sustainability efforts and allocate resources accordingly.

The importance of the GMM model lies in its ability to provide a more robust and flexible framework for analysing the relationship between sustainability practices and financial performance. By incorporating multiple sources of data and accounting for potential biases and errors, the GMM model can provide more accurate and reliable estimates of the relationship between sustainability practices and financial outcomes.

The interpretation of the outcomes of the GMM model is similar to that of the least squares model. The GMM model provides estimated coefficients of the independent variables, which indicate the strength and direction of their relationship with the dependent variable, as well as goodness-of-fit measures such as the R-squared value.

However, the GMM model also provides additional information on the validity of the model assumptions and potential sources of bias or measurement error.

- to evaluate the goodness-of-fit of the GMM model, the R-squared value, which measures the proportion of variation in the dependent variable is explained by the independent variables. It is also important to evaluate the validity of the model assumptions, such as the absence of endogeneity and measurement error.
- Interpretation of results: Finally, the estimated coefficients of the independent variables is interpreted to determine the strength and direction of their relationship with the dependent variable. Positive coefficients indicate a positive relationship between the independent variable and the dependent variable, while negative coefficients indicate a negative relationship. The magnitude of the coefficients provides information on the strength of the relationship, while statistical tests is used to determine whether the coefficients are statistically significant.

**MODEL DIAGNOSIS TEST**

The study of financial performance of companies that prioritize sustainability involves analysing the relationship between sustainability practices and financial outcomes. The least square model is a statistical technique that is used to estimate this relationship. However, to ensure the reliability of the results, it is essential to conduct model diagnosis tests to assess the validity of the model.

Model diagnosis test is a statistical test that is conducted to assess the validity of the least square model. The tests evaluate the assumptions of the model, such as normality, homoscedasticity, linearity, and independence of residuals, to ensure that the results of the model are reliable. It is essential for ensuring that the results of the least square model are valid and reliable.
Without the tests, the results of the model may be biased or inaccurate, which could lead to incorrect conclusions and poor decision-making.

The significance of model diagnosis tests lies in their ability to identify potential problems with the model, such as outliers, heteroscedasticity, or multicollinearity, that could affect the validity of the results. By detecting these issues, researchers can address them and improve the accuracy of the model.

- Interpretation of outcomes: The outcomes of model diagnosis tests are interpreted in the context of the assumptions of the least square model.

  For example, if the test for normality indicates that the residuals are not normally distributed, this could indicate a violation of the normality assumption of the model. Similarly, if the test for homoscedasticity indicates that the variance of the residuals is not constant, this could indicate a violation of the homoscedasticity assumption of the model.
  Depending on the outcome of the tests, researchers may need to modify the model or use alternative statistical techniques to improve the validity of the results.

Overall, model diagnosis tests are an essential part of the study of financial performance of sustainable companies. By ensuring the validity and reliability of the results, these tests help researchers to gain valuable insights into the relationship between sustainability practices and financial outcomes and make informed decisions based on those insights.

## *Heteroscedasticity*

Heteroscedasticity refers to a situation where the variance of the residuals is not constant across the range of the independent variable(s). In the context of the least square model, heteroscedasticity violates the assumption of homoscedasticity, which assumes that the variance of the residuals is constant across the range of the independent variable(s). Therefore, the presence of heteroscedasticity can affect the validity and reliability of the results of the least square model.

A heteroscedasticity test is conducted as part of the model diagnosis process to check for this issue. The test examines whether the variance of the residuals is constant across the range of the independent variable(s). The importance of the heteroscedasticity test lies in its ability to detect heteroscedasticity and its impact on the results of the least square model.

If heteroscedasticity is present in the model, the standard errors of the estimated coefficients are biased, making the estimated coefficients unreliable. This can lead to incorrect inferences and conclusions. Moreover, the model's prediction accuracy can be affected since the model's fit might be better in some areas of the range of the independent variable(s) than in others.

Therefore, it is essential to test for heteroscedasticity as part of the model diagnosis process. If heteroscedasticity is detected, researchers may need to modify the model or use alternative statistical techniques to address the issue. For example, using a weighted least square method can address heteroscedasticity by giving more weight to observations with a smaller variance and less weight to observations with a larger variance.

In summary, the heteroscedasticity test is essential in the model diagnosis process as it helps detect any violation of the homoscedasticity assumption. Detecting and addressing heteroscedasticity is critical for ensuring the validity and reliability of the results of the least square model.

## *Auto correlation*

Autocorrelation test, also known as Durbin-Watson test, is an important model diagnosis test that is used to detect the presence of autocorrelation in the residuals of a regression model. Autocorrelation occurs when the residuals of a regression model are not independent, and this violates one of the fundamental assumptions of the least square model, which assumes that the residuals are independent and identically distributed with a mean of zero and constant variance.

The importance of the autocorrelation test in model diagnosis lies in its ability to detect the presence of autocorrelation in the residuals of a regression model. If autocorrelation exists, it can bias the coefficient estimates, standard errors, and statistical significance tests of the regression model. This can lead to incorrect conclusions and poor decision-making based on the results of the model. By detecting and addressing autocorrelation in the residuals, researchers can improve the accuracy and reliability of the regression model.

There are several reasons why autocorrelation can occur in the residuals of a regression model. For example, it may occur when the model specification is mis specified, or when there are time series trends or seasonality effects that are not accounted for in the model. Additionally, autocorrelation can also occur when there are omitted variables that are correlated with the independent variables in the model.

In summary, the autocorrelation test is an important model diagnosis test that helps to ensure the validity and reliability of the results of a regression model. By detecting and addressing the presence of autocorrelation in the residuals, researchers can improve the accuracy of the coefficient estimates, standard errors, and statistical significance tests of the model. This can lead to more informed decision-making based on the results of the analysis.

## *Multicollinearity*

Multicollinearity is a condition that can occur when there is a high correlation between two or more independent variables in a regression model. Multicollinearity can lead to unreliable and misleading results, as it can cause problems with the estimation of coefficients and the interpretation of the relationship between the independent variables and the dependent variable. Therefore, it is essential to test for multicollinearity as part of the model diagnosis process.

The importance of multicollinearity testing in model diagnosis is to ensure that the regression model is valid and reliable.

When multicollinearity is present in the data, it can cause several issues that can affect the accuracy of the regression model, such as:

- Unstable estimates: Multicollinearity can cause instability in the estimates of the regression coefficients, making them sensitive to minor changes in the data.
- Inaccurate coefficient estimates: Multicollinearity can lead to large standard errors and low t-values, which can result in inaccurate estimates of the regression coefficients.
- Difficulty in interpretation: Multicollinearity can make it challenging to interpret the coefficients of the regression model. This is because it can be difficult to determine the specific contribution of each independent variable to the dependent variable when there is high correlation among the independent variables.

Therefore, by testing for multicollinearity can identify any issues related to this condition and take appropriate actions to address them.
In conclusion, multicollinearity testing is an important part of the model diagnosis process in regression analysis. It helps ensure that the results of the regression model are accurate and reliable and that any issues related to multicollinearity are addressed appropriately.

**RAMSEY RESET TEST**

The Ramsey RESET test is a statistical technique used to test the presence of omitted variables or misspecification in a regression model. In the context of studying the financial performance of companies that prioritize sustainability, the Ramsey RESET test can be used to evaluate the adequacy of a regression model that includes sustainability indicators as independent variables.

The Ramsey RESET test is based on the idea that if the model is correctly specified and all relevant variables are included, then the residuals of the model should be random and have no systematic pattern. If, however, there is a systematic pattern in the residuals, then it may suggest that there are omitted variables or misspecification in the model.

The Ramsey RESET test is important because it can help to identify whether a regression model is adequately specified or not. If the model is mis specified, the coefficients of the independent variables may be biased or inconsistent, which can lead to incorrect conclusions and predictions. By using the Ramsey RESET test, researchers can identify potential issues with the model and make adjustments as needed.

The significance of the Ramsey RESET test in the study of financial performance of sustainable companies lies in its potential to improve the accuracy of regression models that include sustainability indicators. By testing the adequacy of the model and correcting any misspecification or omitted variables, the test can help to ensure that the estimated coefficients of the sustainability indicators are reliable and can be used to make informed decisions.

- Interpretation of outcomes: The outcome of the Ramsey RESET test is a p-value, which indicates the probability of observing the test statistic if the null hypothesis is true. The null hypothesis is that there is no omitted variable or misspecification in the model, while the alternative hypothesis is that there is. If the p-value is less than the significance level (usually 0.05), then the null hypothesis is rejected, and it suggests that there is a systematic pattern in the residuals, indicating a misspecification or omitted variable.
- Purpose: The purpose of the Ramsey RESET test is to test the adequacy of a regression model and to identify any potential issues with the model. By using the test, researchers can evaluate the accuracy and reliability of the estimated coefficients and make adjustments as needed. In the study of financial performance of sustainable companies, the Ramsey RESET test can help to ensure that regression models that include sustainability indicators are properly specified and can be used to make informed decisions.

## *1.6 Limitations of the Study*

The various constraints faced during the conduct of the study includes the following:

1. The diversity of sustainability practices: Sustainability practices encompass a wide range of practices, including environmental, social, and governance (ESG) practices. Different companies may prioritize different aspects of sustainability, which made it difficult to generalize the final results. Hence, to overcome this final ESG scores were used for the study.

2. Limited availability of reliable data: reliable data pertaining to financial performance of Indian companies was a constraint for conducting a comprehensive analysis of the relationship between sustainability practices and financial performance.

## *1.7 Chapterisation*

**Chapter 1: Introduction to the Topic**

Background, scope and importance of the study
- Definition of sustainability
- Theoretical framework for the relationship between sustainability and financial performance

Literature Review
- Review of previous studies on sustainability and financial performance in Indian companies
- Identification of Research Gap

Objectives of the study
- Framework of objectives

Research Methodology
- Research design and approach
- Data collection methods
- Sample selection criteria and size
- Data analysis techniques
- Limitations

**Chapter 2: Analysis and Discussion**

Data methodology
- Objective 1 analysis
- Objective 2 analysis
- Analysis of financial performance measures (ROE, ROA, ROCE, Net Profit) for companies that prioritize sustainability
- Qualitative analysis of sustainability practices and their impact on financial performance
- Comparison of financial performance measures for companies that prioritize sustainability
- Discussion of findings

**Chapter 3: Summary, Findings and Conclusion**

Summary of key findings
- Conclusions drawn from the study
- Implications of the study for Indian companies and stakeholders
- Recommendations for future research

References
- List of all sources cited in the dissertation
- Bibliography

# CHAPTER 2: ANALYSIS AND DISCUSSION

## *2.1 Introduction*

***Objective 1:***
To evaluate the financial performance of listed companies in India having high ESG score to that with low ESG Score.

***Objective 2:***
To determine the relationship between sustainability and financial performance indicators such ROE (Return on Equity), ROCE (Return on Capital Employed), Return on Assets (ROA) and Net profit.

## *2.2 Methodology*

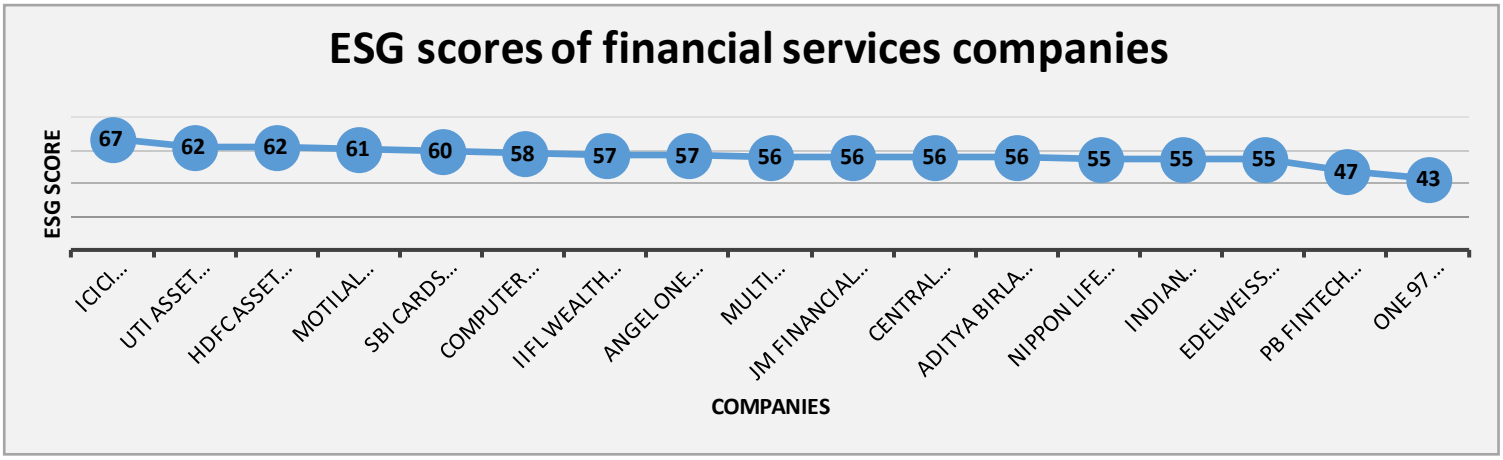
**OBJECTIVE 1**: To evaluate the financial performance of listed companies in India having high ESG score to that with low ESG Score.

### 2.2.A SECTOR: FINANCIAL SERVICES

***DEPENDENT VARIABLE: ESG SCORE***

***Table 2.2.a Financial Service Companies listed in order of highest to lowest ESG score***

| Company Name | ESG Score 2022(Latest) |
|---|---|
| ICICI Securities Limited | 67 |
| UTI Asset Management Company Limited | 62 |
| HDFC Asset Management Company Limited | 62 |
| Motilal Oswal Financial Services Limited | 61 |
| SBI Cards and Payment Services Limited | 60 |
| Computer Age Management Services Limited | 58 |
| IIFL Wealth Management Limited | 57 |
| Angel One Limited | 57 |
| Multi Commodity Exchange of India Limited | 56 |
| JM Financial Limited | 56 |
| Central Depository Services India Limited | 56 |
| Aditya Birla Sun Life AMC Limited | 56 |
| Nippon Life India Asset Management Limited | 55 |
| Indian Energy Exchange Limited | 55 |
| Edelweiss Financial Services Limited | 55 |
| PB Fintech Limited | 47 |
| One 97 Communications Limited | 43 |




*Source: CRISIL*

The above graph shows the ESG (Environmental, Social, and Governance) scores of various Indian Financial Services companies. ESG scores are used to evaluate a company's performance in areas related to sustainability and ethical practices.

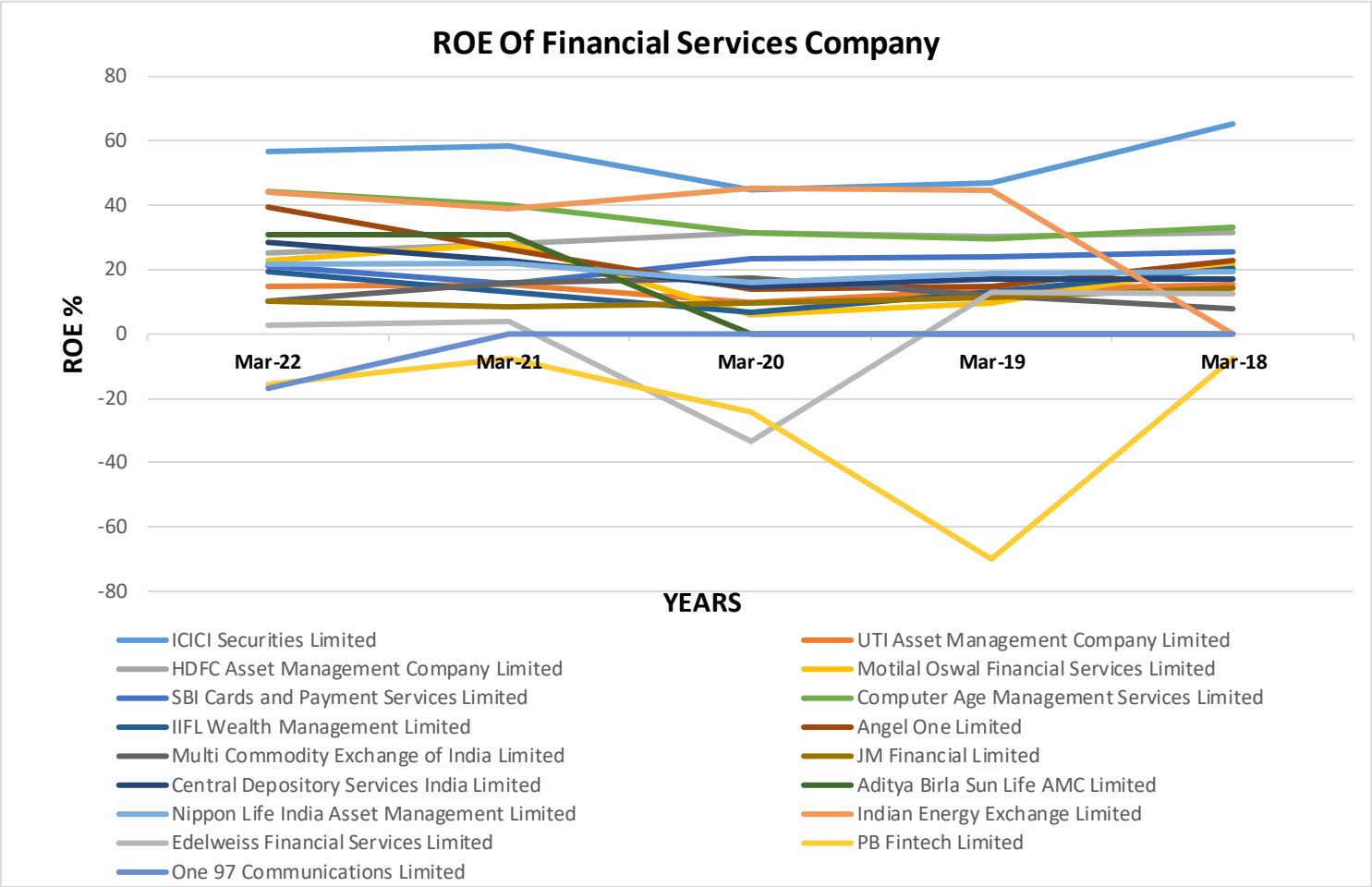
The key observations based on the graph are:
The highest ESG score is 67, obtained by ICICI Securities Limited, indicating a relatively strong performance in terms of ESG factors whereas One 97 Communications Limited, has obtained the lowest ESG score that is 43, indicating a relatively weaker performance in terms of ESG factors compared to other companies in the list.
The range of ESG scores varies from 43 to 67, indicating a significant difference in ESG performance among the listed companies.
Some of the notable companies in the list with relatively high ESG scores are HDFC Asset Management Company Limited, Motilal Oswal Financial Services Limited and SBI Cards and Payment Services Limited Fintech Limited and One 97 Communications Limited have relatively low ESG scores compared to other companies in the list.

## ***INDEPENDENT VARIABLE: ROE***

***Table 2.2.b ROE values of Financial Services Companies from FY (2018-22)***

| Return on Net worth/Equity (%) | | | | | |
|---|---|---|---|---|---|
| **Company Name** | **2022** | **2021** | **2020** | **2019** | **2018** |
| ICICI Securities Limited | 56.88 | 58.6 | 44.81 | 46.85 | 65.29 |
| UTI Asset Management Company Limited | 14.81 | 15.19 | 9.79 | 13.54 | 15.38 |
| HDFC Asset Management Company Limited | 25.19 | 27.75 | 31.33 | 30.3 | 31.55 |
| Motilal Oswal Financial Services Limited | 23.08 | 28.1 | 5.94 | 9.62 | 21.56 |
| SBI Cards and Payment Services Limited | 20.84 | 15.62 | 23.3 | 24.08 | 25.54 |
| Computer Age Management Services Limited | 44.3 | 39.79 | 31.3 | 29.56 | 32.9 |
| IIFL Wealth Management Limited | 19.27 | 13.05 | 6.72 | 12.86 | 20.4 |
| Angel One Limited | 39.43 | 26.24 | 13.92 | 15.02 | 22.61 |
| Multi Commodity Exchange of India Limited | 10.11 | 15.88 | 17.39 | 11.69 | 7.84 |
| JM Financial Limited | 10.05 | 8.43 | 9.66 | 11.14 | 14.26 |
| Central Depository Services India Limited | 28.47 | 22.83 | 14.66 | 16.98 | 17.23 |
| Aditya Birla Sun Life AMC Limited | 30.62 | 30.87 | 0 | 0 | 0 |
| Nippon Life India Asset Management Limited | 21.39 | 21.94 | 16.01 | 18.91 | 19.26 |
| Indian Energy Exchange Limited | 43.96 | 39.17 | 45.29 | 44.57 | 0 |
| Edelweiss Financial Services Limited | 2.88 | 4.03 | -33.37 | 12.96 | 12.54 |
| PB Fintech Limited | -15.39 | -7.54 | -24.03 | -69.95 | -7.52 |
| One 97 Communications Limited | -16.9 | 0 | 0 | 0 | 0 |

*source: moneycontrol.com*




The above graph indicates the trend on Return on Net worth/Equity (%) of the selected Indian companies for the years 2018 to 2022.
Return on Equity (ROE) is a financial performance measure that indicates the profitability of a company by measuring the return generated on the equity investment of the shareholders.

It is observed that the ROE of the companies varies widely. ICICI Securities Limited has an ROE of 56.88% in 2022, which is a decrease from the previous year's 58.6%. On the other hand, PB Fintech Limited has negative ROE in all the years, with the lowest being -69.95% in 2019.
HDFC Asset Management Company Limited has consistently high ROE over the years, with 25.19% in 2022. Another company with a high ROE in 2022 is Indian Energy Exchange Limited, with a value of 43.96%. whereas ROE of the same company was 0% in 2018.

The ROE values for some companies have fluctuated over the years. For example, SBI Cards and Payment Services Limited had an ROE of 20.84% in 2022, which is an increase from the previous year's 15.62%.
In contrast, Edelweiss Financial Services Limited had an ROE of -33.37% in 2020, which improved to 4.03% in 2021 and then decreased to 2.88% in 2022.

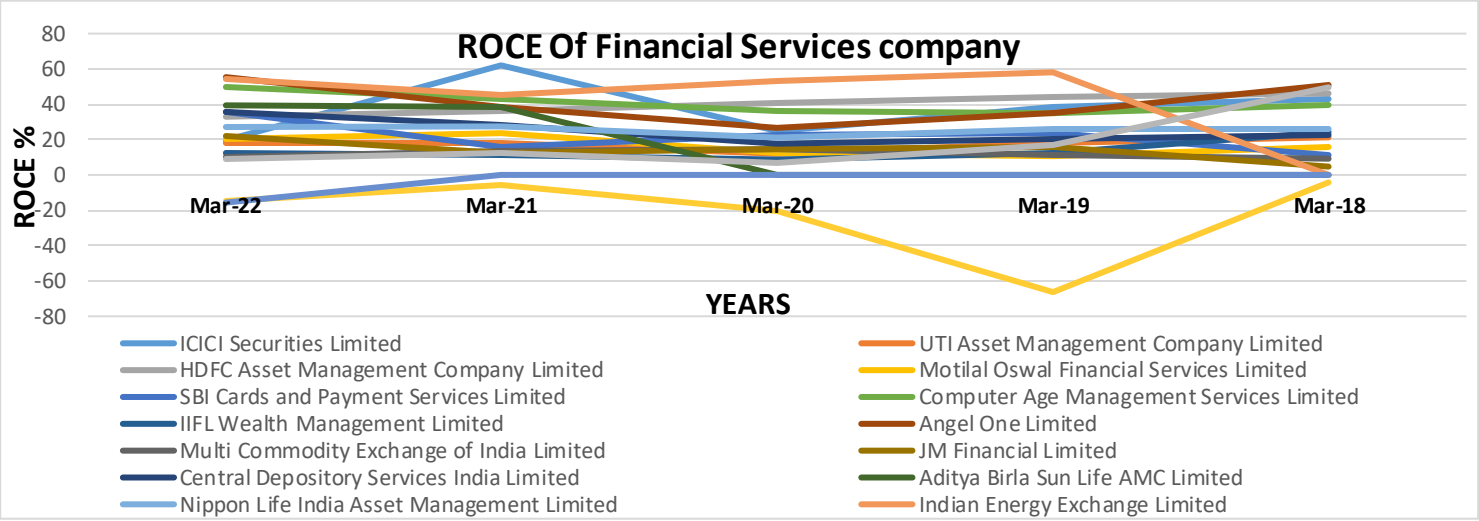
Further an analysis will state whether there is a correlation between the sustainability measures and the financial performance of these companies based on ROE.

***INDEPENDENT VARIABLE: ROCE***

***Table 2.2.c ROCE values of Financial Services Companies from FY (2018-22)***

| Return on Capital Employed (%) | | | | | |
|---|---|---|---|---|---|
| **Company Name** | **2022** | **2021** | **2020** | **2019** | **2018** |
| ICICI Securities Limited | 19.66 | 62.01 | 25.25 | 38.1 | 42.96 |
| UTI Asset Management Company Limited | 18.1 | 18.05 | 11.98 | 17.94 | 21.28 |
| HDFC Asset Management Company Limited | 32.92 | 36.13 | 40.7 | 44.19 | 46.13 |
| Motilal Oswal Financial Services Limited | 20.52 | 23.64 | 12.7 | 10.61 | 15.79 |
| SBI Cards and Payment Services Limited | 35.68 | 16.08 | 22.49 | 23.17 | 11.24 |
| Computer Age Management Services Limited | 49.77 | 43.08 | 36.63 | 34.95 | 39.44 |
| IIFL Wealth Management Limited | 12.61 | 11.83 | 8.68 | 12.78 | 24.24 |
| Angel One Limited | 55.35 | 37.94 | 26.63 | 34.91 | 50.68 |
| Multi Commodity Exchange of India Limited | 10.25 | 13.71 | 14.55 | 10.91 | 9.18 |
| JM Financial Limited | 22.03 | 11.9 | 15.01 | 15.49 | 4.71 |
| Central Depository Services India Limited | 35.65 | 28.06 | 17.68 | 20.85 | 22.92 |
| Aditya Birla Sun Life AMC Limited | 39.38 | 38.09 | 0 | 0 | 0 |
| Nippon Life India Asset Management Limited | 27.43 | 27.46 | 21.14 | 26.24 | 26.04 |
| Indian Energy Exchange Limited | 53.84 | 45.19 | 52.6 | 58.08 | 0 |
| Edelweiss Financial Services Limited | 8.65 | 12.55 | 6.79 | 16.71 | 49.57 |
| PB Fintech Limited | -14.69 | -6.18 | -20.6 | -66.33 | -4.22 |
| One 97 Communications Limited | -15.67 | 0 | 0 | 0 | 0 |

*source: moneycontrol.com*




Return on Capital Employed (ROCE) is a financial ratio that measures the efficiency and profitability of a company's capital investments. It indicates the company's ability to generate profits from the capital employed in the business.

From the above graph, it is observed that:
The companies with the highest ROCE in 2022 are Angel One Limited (55.35%), Indian Energy Exchange Limited (53.84%), and SBI Cards and Payment Services Limited (35.68%) whereas,
The companies with the lowest ROCE in 2022 are One 97 Communications Limited (-15.67%), PB Fintech Limited (-14.69%), and Edelweiss Financial Services Limited (8.65%).

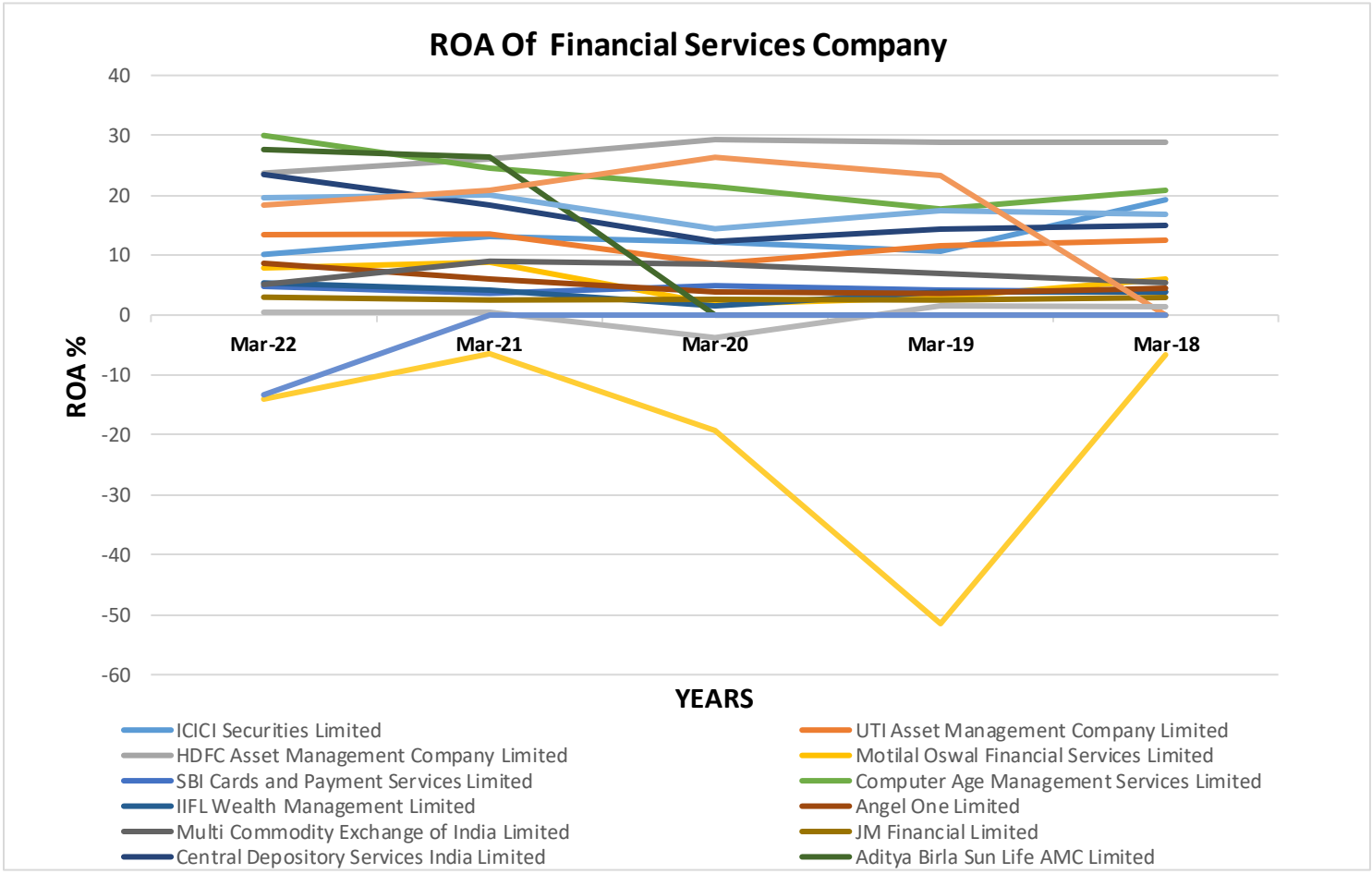
In general, a high ROCE indicates that a company is using its capital efficiently and generating strong profits, while a low ROCE suggests that a company may not be using its capital efficiently and could be underperforming compared to its peers.

## *INDEPENDENT VARIABLE: ROA*

***Table 2.2.d ROA values of Financial Services Companies from FY (2018-22)***

| Return on Assets (%) | | | | | |
|---|---|---|---|---|---|
| **Company Name** | **2022** | **2021** | **2020** | **2019** | **2018** |
| ICICI Securities Limited | 10.13 | 13.05 | 12.19 | 10.52 | 19.25 |
| UTI Asset Management Company Limited | 13.39 | 13.53 | 8.57 | 11.7 | 12.47 |
| HDFC Asset Management Company Limited | 23.69 | 26.02 | 29.29 | 28.86 | 28.77 |
| Motilal Oswal Financial Services Limited | 7.73 | 8.82 | 1.81 | 2.8 | 5.93 |
| SBI Cards and Payment Services Limited | 4.66 | 3.64 | 4.91 | 4.26 | 3.83 |
| Computer Age Management Services Limited | 29.98 | 24.38 | 21.39 | 17.71 | 20.91 |
| IIFL Wealth Management Limited | 5.37 | 4.22 | 1.54 | 3.82 | 3.97 |
| Angel One Limited | 8.65 | 6.16 | 3.75 | 3.61 | 4.5 |
| Multi Commodity Exchange of India Limited | 5.12 | 8.99 | 8.64 | 7.04 | 5.51 |
| JM Financial Limited | 2.99 | 2.52 | 2.62 | 2.52 | 2.92 |
| Central Depository Services India Limited | 23.47 | 18.48 | 12.29 | 14.48 | 14.88 |
| Aditya Birla Sun Life AMC Limited | 27.63 | 26.51 | 0 | 0 | 0 |
| Nippon Life India Asset Management Limited | 19.6 | 20.05 | 14.41 | 17.51 | 16.74 |
| Indian Energy Exchange Limited | 18.23 | 20.91 | 26.33 | 23.39 | 0 |
| Edelweiss Financial Services Limited | 0.43 | 0.57 | -3.76 | 1.55 | 1.35 |
| PB Fintech Limited | -14.08 | -6.44 | -19.29 | -51.49 | -6.72 |
| One 97 Communications Limited | -13.3 | 0 | 0 | 0 | 0 |

*source: moneycontrol.com*



Return on Assets (ROA) is a profitability ratio that measures the company's ability to generate earnings from its assets. Here are some observations based on the above graph of ROA values for financial services companies from FY (2018-22):

HDFC Asset Management Company Limited has consistently shown a higher ROA than other companies in the list, indicating that the company has been more efficient in generating earnings from its assets.
Similarly, Computer Age Management Services Limited has also shown consistently high ROA values, which indicates that the company has been able to generate more earnings per rupee of assets.
Aditya Birla Sun Life AMC Limited showed an ROA value only for 2021 and 2022, which were both higher than any other company's ROA values in those years.

PB Fintech Limited and One 97 Communications Limited showed negative ROA values, which suggests that they were not able to generate sufficient earnings from their assets, and they might need to take corrective measures to improve their profitability.

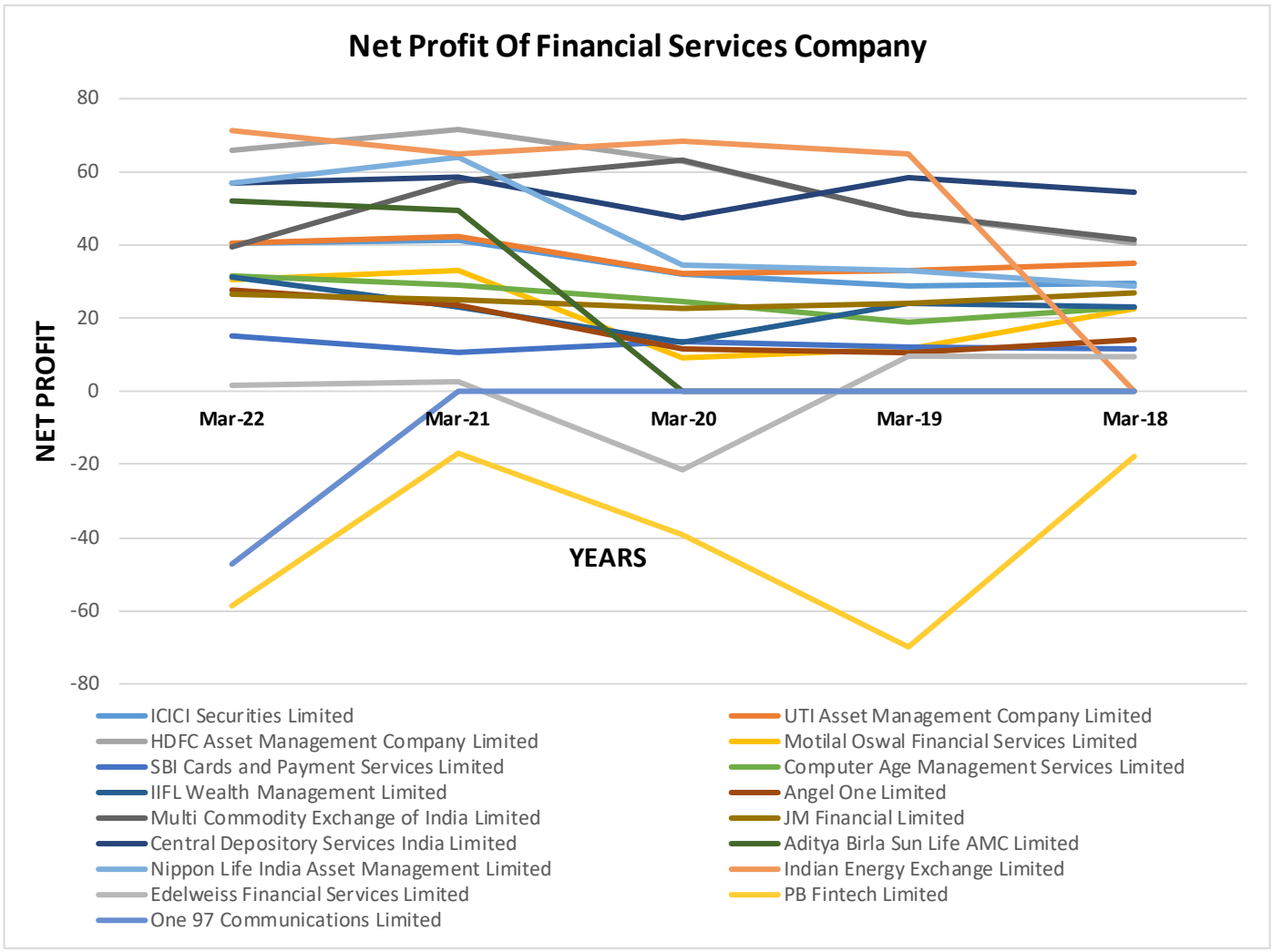
Overall, the ROA values can provide insights into a company's efficiency in generating earnings from its assets, but it is important to consider other financial metrics and qualitative factors before making any investment decisions.

## ***INDEPENDENT VARIABLE: NET PROFIT***

***Table 2.2.e Net Profit values of Financial Services Companies from FY (2018-22)***

| | Net Profit Margin (%) | | | | |
|---|---|---|---|---|---|
| **Company Name** | **2022** | **2021** | **2020** | **2019** | **2018** |
| ICICI Securities Limited | 40.25 | 41.28 | 31.76 | 28.78 | 29.74 |
| UTI Asset Management Company Limited | 40.52 | 42.3 | 32.19 | 33.11 | 35.22 |
| HDFC Asset Management Company Limited | 65.85 | 71.56 | 63.01 | 48.59 | 40.48 |
| Motilal Oswal Financial Services Limited | 30.5 | 33.03 | 9.13 | 11.78 | 22.65 |
| SBI Cards and Payment Services Limited | 15.13 | 10.61 | 13.41 | 12.32 | 11.58 |
| Computer Age Management Services Limited | 31.54 | 29.09 | 24.56 | 18.87 | 22.8 |
| IIFL Wealth Management Limited | 31.21 | 22.9 | 13.38 | 24.17 | 22.92 |
| Angel One Limited | 27.66 | 23.49 | 11.36 | 10.53 | 14.01 |
| Multi Commodity Exchange of India Limited | 39.45 | 57.64 | 63.19 | 48.59 | 41.7 |
| JM Financial Limited | 26.76 | 25.2 | 22.65 | 24.04 | 26.89 |
| Central Depository Services India Limited | 56.81 | 58.55 | 47.4 | 58.5 | 54.25 |
| Aditya Birla Sun Life AMC Limited | 52.03 | 49.28 | 0 | 0 | 0 |
| Nippon Life India Asset Management Limited | 56.89 | 63.96 | 34.56 | 32.94 | 28.72 |
| Indian Energy Exchange Limited | 71.26 | 64.63 | 68.33 | 64.95 | 0 |
| Edelweiss Financial Services Limited | 1.66 | 2.72 | -21.48 | 9.38 | 9.44 |
| PB Fintech Limited | -58.45 | -16.94 | -39.41 | -69.92 | -17.72 |
| One 97 Communications Limited | -47.25 | 0 | 0 | 0 | 0 |

*source: moneycontrol.com*




The above chart provides the net profit margin percentage of various financial services companies in India from the financial year (FY) 2018-19 to FY 2021-22.
The net profit margin is a financial metric that measures the amount of profit earned by a company relative to its revenue. It represents the percentage of each rupee of revenue that is converted into profit after accounting for all expenses, including taxes.

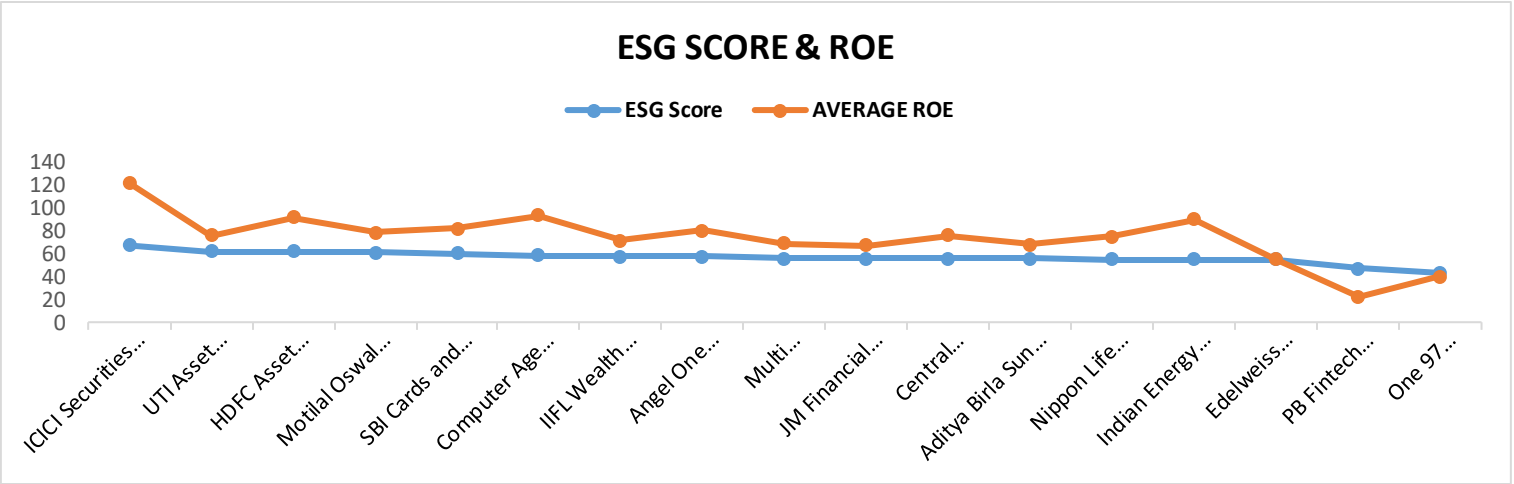
The graph shows that some companies have consistently maintained a high net profit margin over the years, such as HDFC Asset Management Company Limited, Central Depository Services India Limited, and Nippon Life India Asset Management Limited. On the other hand, some companies have witnessed fluctuations in their net profit margin, such as ICICI Securities Limited, UTI Asset Management Company Limited, and SBI Cards and Payment Services Limited.

It is important to note that some companies, such as Aditya Birla Sun Life AMC Limited, Indian Energy Exchange Limited, and One 97 Communications Limited, did not report any net profit for certain years. Additionally, PB Fintech Limited reported negative net profit margin for all years, which indicates that the company incurred losses during these periods.

## 2.3 RELATIONSHIP BETWEEN SUSTAINABILITY AND FINANCIAL PERFORMANCE OF FINANCIAL SERVICES SECTOR

***Table2.3. a Growth performance based on ESG score & ROE by taking an average from FY (2018-22)***

| Company Name | ESG Score | AVERAGE ROE |
|---|---|---|
| ICICI Securities Limited | 67 | 54.49 |
| UTI Asset Management Company Limited | 62 | 13.74 |
| HDFC Asset Management Company Limited | 62 | 29.22 |
| Motilal Oswal Financial Services Limited | 61 | 17.66 |
| SBI Cards and Payment Services Limited | 60 | 21.88 |
| Computer Age Management Services Limited | 58 | 35.57 |
| IIFL Wealth Management Limited | 57 | 14.46 |
| Angel One Limited | 57 | 23.44 |
| Multi Commodity Exchange of India Limited | 56 | 12.58 |
| JM Financial Limited | 56 | 10.71 |
| Central Depository Services India Limited | 56 | 20.03 |
| Aditya Birla Sun Life AMC Limited | 56 | 12.30 |
| Nippon Life India Asset Management Limited | 55 | 19.50 |
| Indian Energy Exchange Limited | 55 | 34.60 |
| Edelweiss Financial Services Limited | 55 | -0.19 |
| PB Fintech Limited | 47 | -24.89 |
| One 97 Communications Limited | 43 | -3.38 |




The graph shows the ESG score and average ROE (Return on Equity) of different companies. ROE is a financial metric that measures a company's profitability by calculating how much profit a company generates with the money shareholders have invested.

By comparing the ESG scores and ROE of companies, it can be seen that there is no clear correlation between high ESG scores and high ROE. For example, ICICI Securities Limited has a high ESG score of 67, but its average ROE is 54.49. Similarly, UTI Asset Management Company Limited and HDFC Asset Management Company Limited have ESG scores of 62 but their ROEs are 13.74 and 29.22 respectively, which are significantly different from each other.

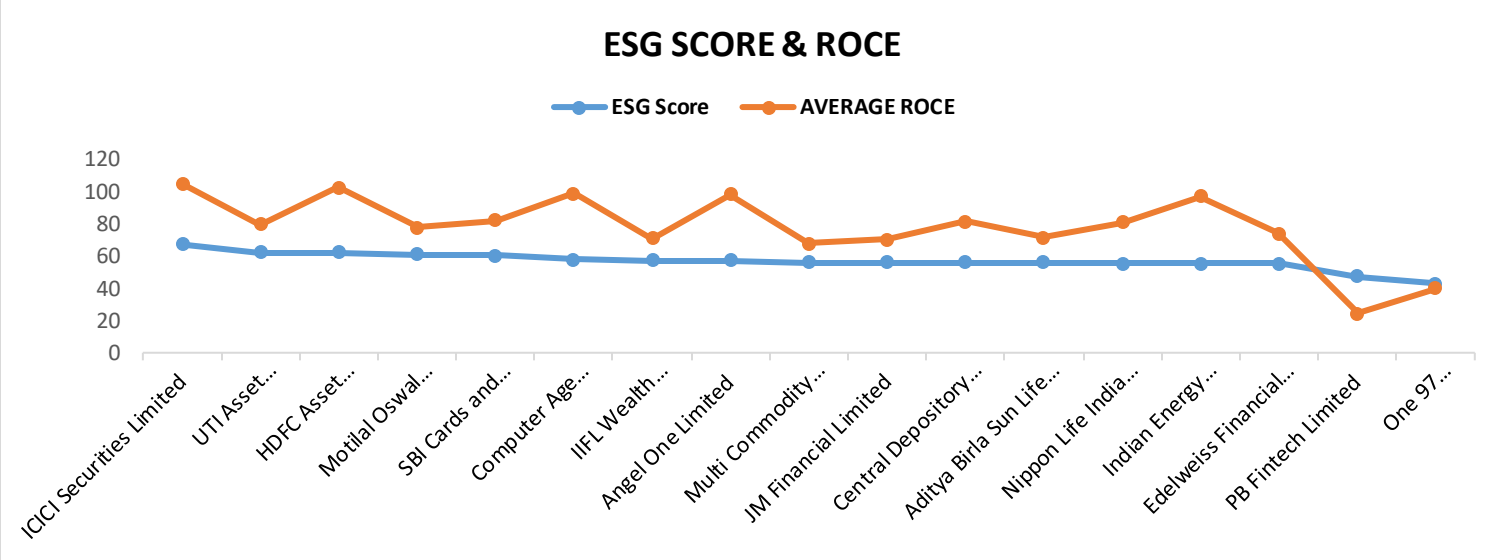
On the other hand, there are also companies with relatively low ESG scores but have higher ROEs such as Indian Energy Exchange Limited, which has an ESG score of 55 but an average ROE of 34.60.

PB Fintech Limited and One 97 Communications Limited have the lowest ESG scores of 47 and 43 respectively, but their average ROEs are -24.89 and -3.38, indicating negative profitability.

Therefore, it can be concluded that ESG scores and ROE do not have a direct correlation, and it is essential to evaluate both sustainability and financial performance independently while investing in companies.

***Table 2.3.b Growth performance based on ESG score & ROCE by taking an average from FY (2018-22)***

| Company Name | ESG Score | AVERAGE ROCE |
|---|---|---|
| ICICI Securities Limited | 67 | 37.596 |
| UTI Asset Management Company Limited | 62 | 17.47 |
| HDFC Asset Management Company Limited | 62 | 40.014 |
| Motilal Oswal Financial Services Limited | 61 | 16.652 |
| SBI Cards and Payment Services Limited | 60 | 21.732 |
| Computer Age Management Services Limited | 58 | 40.774 |
| IIFL Wealth Management Limited | 57 | 14.028 |
| Angel One Limited | 57 | 41.102 |
| Multi Commodity Exchange of India Limited | 56 | 11.72 |
| JM Financial Limited | 56 | 13.828 |
| Central Depository Services India Limited | 56 | 25.032 |
| Aditya Birla Sun Life AMC Limited | 56 | 15.494 |
| Nippon Life India Asset Management Limited | 55 | 25.662 |
| Indian Energy Exchange Limited | 55 | 41.942 |
| Edelweiss Financial Services Limited | 55 | 18.854 |
| PB Fintech Limited | 47 | -22.404 |
| One 97 Communications Limited | 43 | -3.134 |




The Graph shows the ESG score and average Return on Capital Employed (ROCE) for various financial services companies. A higher ROCE indicates that a company is effectively utilizing its capital to generate profits.

According to the graph, companies with a higher ESG score generally have a higher average ROCE. For example, companies like HDFC Asset Management Company Limited, Computer Age

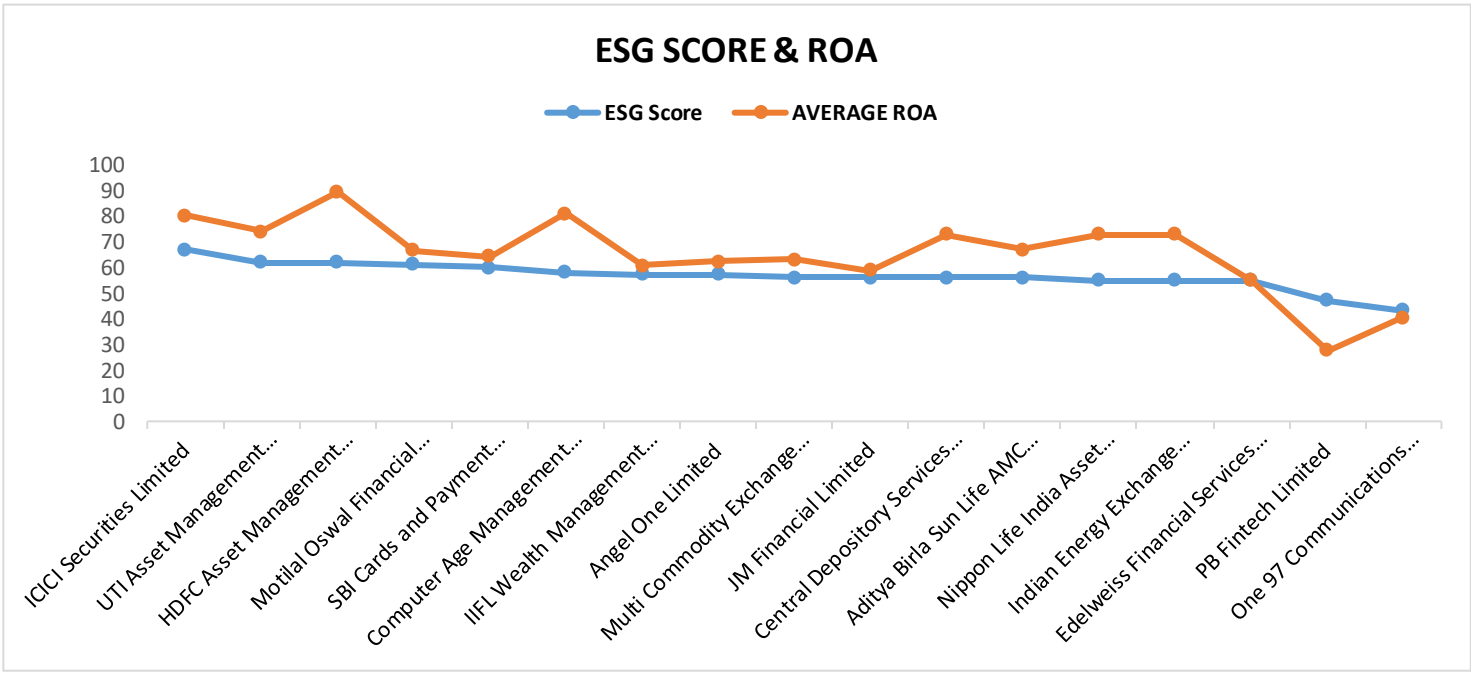
Management Services Limited, Angel One Limited, and Indian Energy Exchange Limited have both a high ESG score and a high average ROCE. This indicates that these companies are not only prioritizing environmental, social, and governance factors but are also able to generate strong financial returns from their capital investments.

On the other hand, companies with lower ESG scores such as PB Fintech Limited and One 97 Communications Limited have negative ROCE, indicating that their capital investments are not generating profits. However, it's important to note that there may be other factors affecting their financial performance beyond just their ESG score.

Overall, the table suggests that there is a correlation between a company's ESG score and its financial performance as measured by ROCE. Companies that prioritize ESG factors may be more likely to generate strong returns on their capital investments.

***Table 2.3.c Growth performance based on ESG score & ROA by taking an average from FY (2018-22)***

| Company Name | ESG Score | AVERAGE ROA |
|---|---|---|
| ICICI Securities Limited | 67 | 13.028 |
| UTI Asset Management Company Limited | 62 | 11.932 |
| HDFC Asset Management Company Limited | 62 | 27.326 |
| Motilal Oswal Financial Services Limited | 61 | 5.418 |
| SBI Cards and Payment Services Limited | 60 | 4.26 |
| Computer Age Management Services Limited | 58 | 22.874 |
| IIFL Wealth Management Limited | 57 | 3.784 |
| Angel One Limited | 57 | 5.334 |
| Multi Commodity Exchange of India Limited | 56 | 7.06 |
| JM Financial Limited | 56 | 2.714 |
| Central Depository Services India Limited | 56 | 16.72 |
| Aditya Birla Sun Life AMC Limited | 56 | 10.828 |
| Nippon Life India Asset Management Limited | 55 | 17.662 |
| Indian Energy Exchange Limited | 55 | 17.772 |
| Edelweiss Financial Services Limited | 55 | 0.028 |
| PB Fintech Limited | 47 | -19.604 |
| One 97 Communications Limited | 43 | -2.66 |



The above graph indicates, that there is no clear correlation between a company's ESG score and its financial performance based on ROA. Some companies with high ESG scores have high ROA, while others have low ROA. The same is true for companies with low ESG scores.

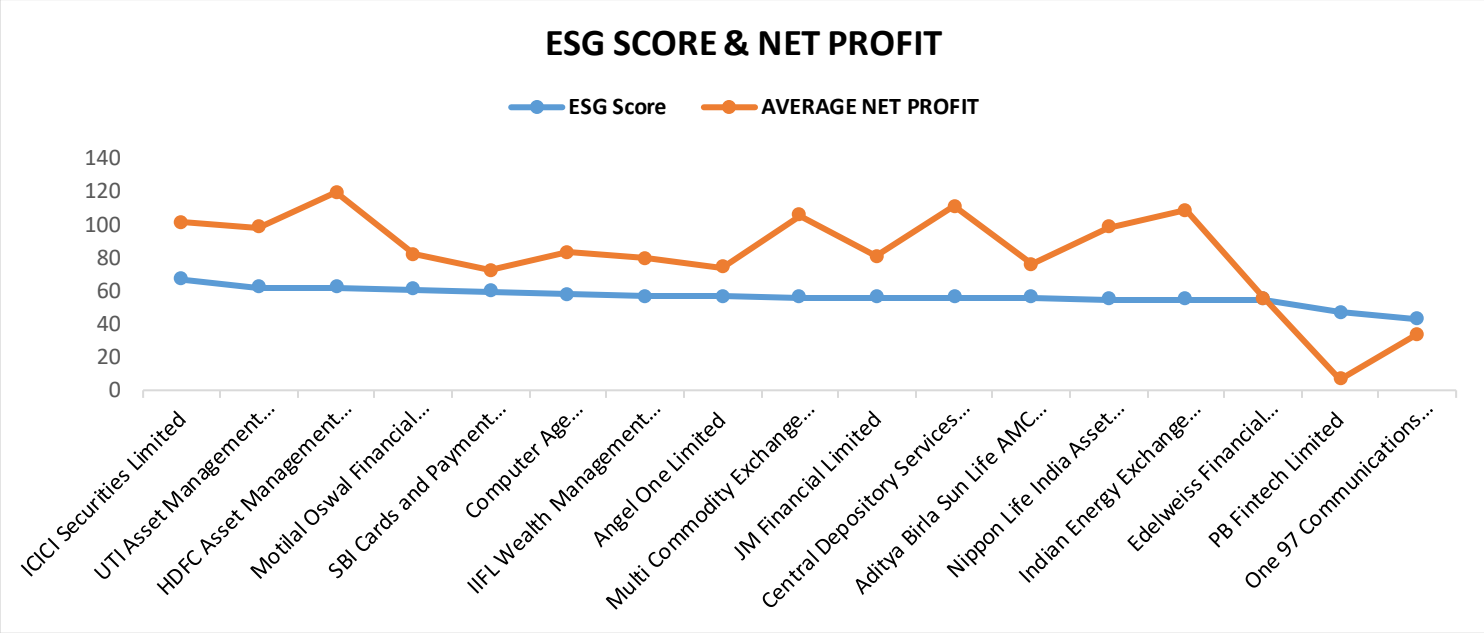
For example, ICICI Securities Limited, UTI Asset Management Company Limited, and HDFC Asset Management Company Limited have high ESG scores and relatively high ROA, while Motilal Oswal Financial Services Limited, SBI Cards and Payment Services Limited, and Edelweiss Financial Services Limited have high ESG scores but low ROA.

Similarly, some companies with low ESG scores have high ROA, such as Indian Energy Exchange Limited, while others have low ROA, such as PB Fintech Limited and One 97 Communications Limited.

Therefore, it is difficult to draw any conclusions about the correlation between a company's ESG score and its financial performance based on ROA from this graph and financial indicator alone.

***Table 2.3.d Growth performance based on ESG score & Net Profit by taking an average from FY (2018-22)***

| Company Name | ESG Score | AVERAGE NET PROFIT |
|---|---|---|
| ICICI Securities Limited | 67 | 34.362 |
| UTI Asset Management Company Limited | 62 | 36.668 |
| HDFC Asset Management Company Limited | 62 | 57.898 |
| Motilal Oswal Financial Services Limited | 61 | 21.418 |
| SBI Cards and Payment Services Limited | 60 | 12.61 |
| Computer Age Management Services Limited | 58 | 25.372 |
| IIFL Wealth Management Limited | 57 | 22.916 |
| Angel One Limited | 57 | 17.41 |
| Multi Commodity Exchange of India Limited | 56 | 50.114 |
| JM Financial Limited | 56 | 25.108 |
| Central Depository Services India Limited | 56 | 55.102 |
| Aditya Birla Sun Life AMC Limited | 56 | 20.262 |
| Nippon Life India Asset Management Limited | 55 | 43.414 |
| Indian Energy Exchange Limited | 55 | 53.834 |
| Edelweiss Financial Services Limited | 55 | 0.344 |
| PB Fintech Limited | 47 | -40.488 |
| One 97 Communications Limited | 43 | -9.45 |




Based on the above graph, it can be observed that companies with high ESG scores generally have better net profits than those with low ESG scores. This indicates that there may be a positive correlation between a company's ESG score and its financial performance based on net profit.

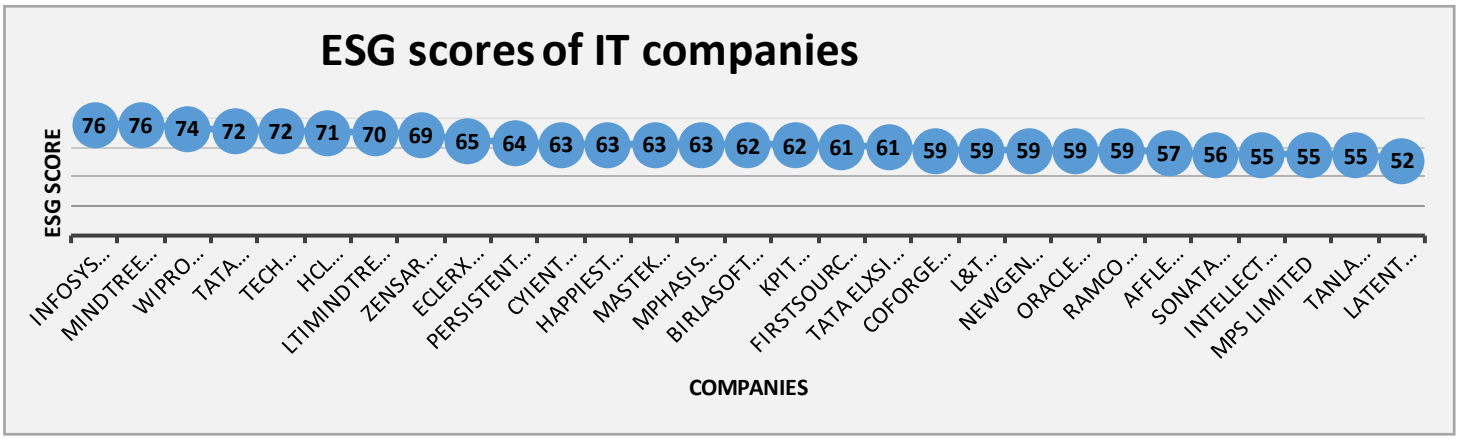
For instance, ICICI Securities Limited, UTI Asset Management Company Limited, and HDFC Asset Management Company Limited have the highest ESG scores in the table and also have the highest average net profits. On the other hand, PB Fintech Limited and One 97 Communications Limited have the lowest ESG scores and also have the lowest average net profits.

## 2.2.B SECTOR: INFORMATION TECHNOLOGY (IT)

### *DEPENDENT VARIABLE: ESG SCORE*

***Table 2.2.f. IT Companies listed in order of highest to lowest ESG score***

| **Company Name** | ESG Score |
|---|---|
| Infosys Limited | 76 |
| MindTree Limited | 76 |
| Wipro Limited | 74 |
| Tata Consultancy Services Limited | 72 |
| Tech Mahindra Limited | 72 |
| HCL Technologies Limited | 71 |
| LTIMindtree Limited | 70 |
| Zensar Technologies Limited | 69 |
| Eclerx Services Limited | 65 |
| Persistent Systems Limited | 64 |
| Cyient Limited | 63 |
| Happiest Minds Technologies Limited | 63 |
| Mastek Limited | 63 |
| Mphasis Limited | 63 |
| Birlasoft Limited | 62 |
| KPIT Technologies Limited | 62 |
| Firstsource Solutions Limited | 61 |
| Tata Elxsi Limited | 61 |
| Coforge Limited | 59 |
| L&T Technology Services Limited | 59 |
| Newgen Software Technologies Limited | 59 |
| Oracle Financial Services Software Limited | 59 |
| Ramco Systems Limited | 59 |
| Affle (India) Limited | 57 |
| Sonata Software Limited | 56 |
| Intellect Design Arena Limited | 55 |
| MPS Limited | 55 |
| Tanla Platforms Limited | 55 |
| Latent View Analytics Limited | 52 |




*Source: CRISI*

The above graph portrays the ESG scores of various IT companies in India.

The table shows that Infosys Limited and MindTree Limited have the highest ESG scores of 76, followed closely by Wipro Limited with a score of 74. Tata Consultancy Services Limited and Tech Mahindra Limited both have a score of 72, while HCL Technologies Limited has a score of 71.

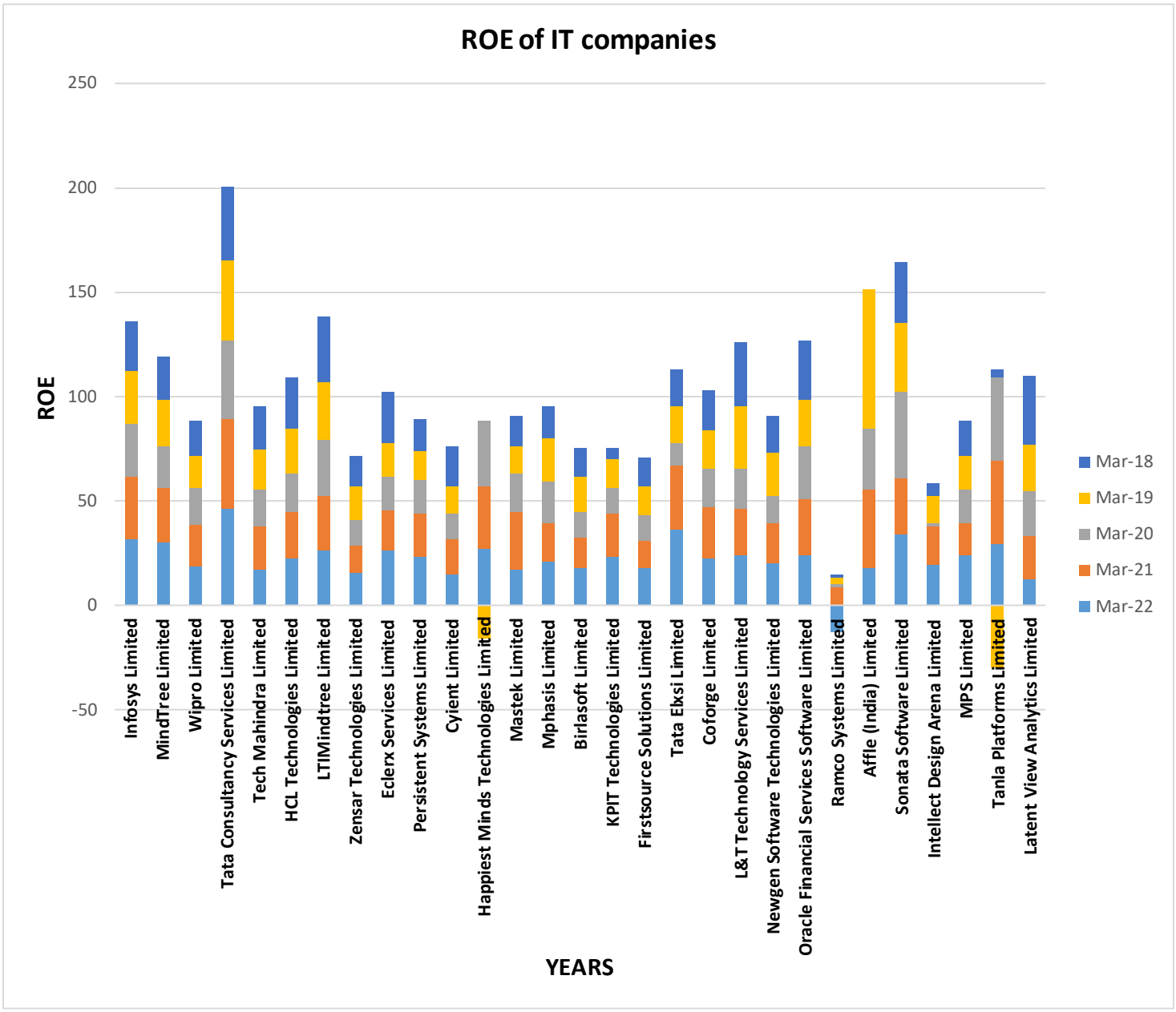
The ESG scores of the other companies on the list range from 70 to 52, with the lowest score being 52 for Latent View Analytics Limited. The table indicates that these companies are focusing on sustainability, social responsibility, and corporate governance, which are becoming increasingly important to investors, customers, and other stakeholders.

## ***INDEPENDENT VARIABLE: ROE***

***Table 2.2.g ROE values of IT Companies from FY (2018-22)***

| | **Return on Net worth/Equity (%)** | | | | |
|---|---|---|---|---|---|
| **Company Name** | **2022** | **2021** | **2020** | **2019** | **2018** |
| Infosys Limited | 31.95 | 29.34 | 25.34 | 25.35 | 23.71 |
| MindTree Limited | 30.19 | 25.71 | 19.98 | 22.8 | 20.79 |
| Wipro Limited | 18.69 | 19.66 | 17.57 | 15.95 | 16.69 |
| Tata Consultancy Services Limited | 46.61 | 42.99 | 37.52 | 38.44 | 35.18 |
| Tech Mahindra Limited | 17.3 | 20.7 | 17.81 | 18.48 | 21.18 |
| HCL Technologies Limited | 22.7 | 21.8 | 18.6 | 21.56 | 24.46 |
| LTIMindtree Limited | 26.56 | 26.05 | 26.5 | 28.12 | 30.97 |
| Zensar Technologies Limited | 15.49 | 12.8 | 12.6 | 16.14 | 14.47 |
| Eclerx Services Limited | 26.62 | 18.82 | 15.99 | 16.53 | 24.07 |
| Persistent Systems Limited | 23.23 | 20.49 | 16.12 | 14.26 | 14.99 |
| Cyient Limited | 14.83 | 16.75 | 12.3 | 13.37 | 18.66 |
| Happiest Minds Technologies Limited | 27.21 | 29.75 | 31.31 | -16.08 | 0 |
| Mastek Limited | 17.4 | 27.54 | 17.93 | 13.44 | 14.16 |
| Mphasis Limited | 20.6 | 18.64 | 20.32 | 20.44 | 15.27 |
| Birlasoft Limited | 17.94 | 14.71 | 11.85 | 16.89 | 13.91 |
| KPIT Technologies Limited | 23.06 | 20.94 | 12.1 | 14 | 5.64 |
| Firstsource Solutions Limited | 17.71 | 12.92 | 12.28 | 13.88 | 13.88 |
| Tata Elxsi Limited | 35.99 | 30.65 | 10.91 | 18.01 | 17.83 |
| Coforge Limited | 22.5 | 24.21 | 18.47 | 18.52 | 19.46 |
| L&T Technology Services Limited | 23.62 | 22.99 | 19.09 | 29.56 | 30.88 |
| Newgen Software Technologies Limited | 20.23 | 18.99 | 13.24 | 20.57 | 17.98 |
| Oracle Financial Services Software Limited | 24.21 | 26.6 | 25.72 | 22.25 | 28.07 |
| Ramco Systems Limited | -12.63 | 8.55 | 1.67 | 2.83 | 2.03 |
| Affle (India) Limited | 18.15 | 37.57 | 28.59 | 67.42 | 0 |
| Sonata Software Limited | 34.24 | 26.94 | 41.35 | 32.44 | 29.47 |
| Intellect Design Arena Limited | 19.29 | 18.86 | 1.53 | 12.88 | 5.82 |
| MPS Limited | 23.74 | 15.36 | 16.31 | 16.13 | 16.76 |
| Tanla Platforms Limited | 29.49 | 39.82 | 39.87 | -30.09 | 4.11 |
| Latent View Analytics Limited | 12.61 | 20.89 | 20.93 | 22.36 | 32.91 |

*source: moneycontrol.com*




The graph shows the Return on Net worth/Equity (%) for various companies for the years 2018 to 2022. The higher the percentage, the better it is for the company's profitability.
The companies listed in the table are mainly IT and software services companies from India, and their ROE performance varies across different years.

Some companies show consistent growth in ROE over the years, such as Infosys, MindTree, and TCS, while some have fluctuated, such as HCL Technologies and L&T Technology Services. Some companies have also shown negative ROE in certain years, such as Happiest Minds Technologies and Ramco Systems.

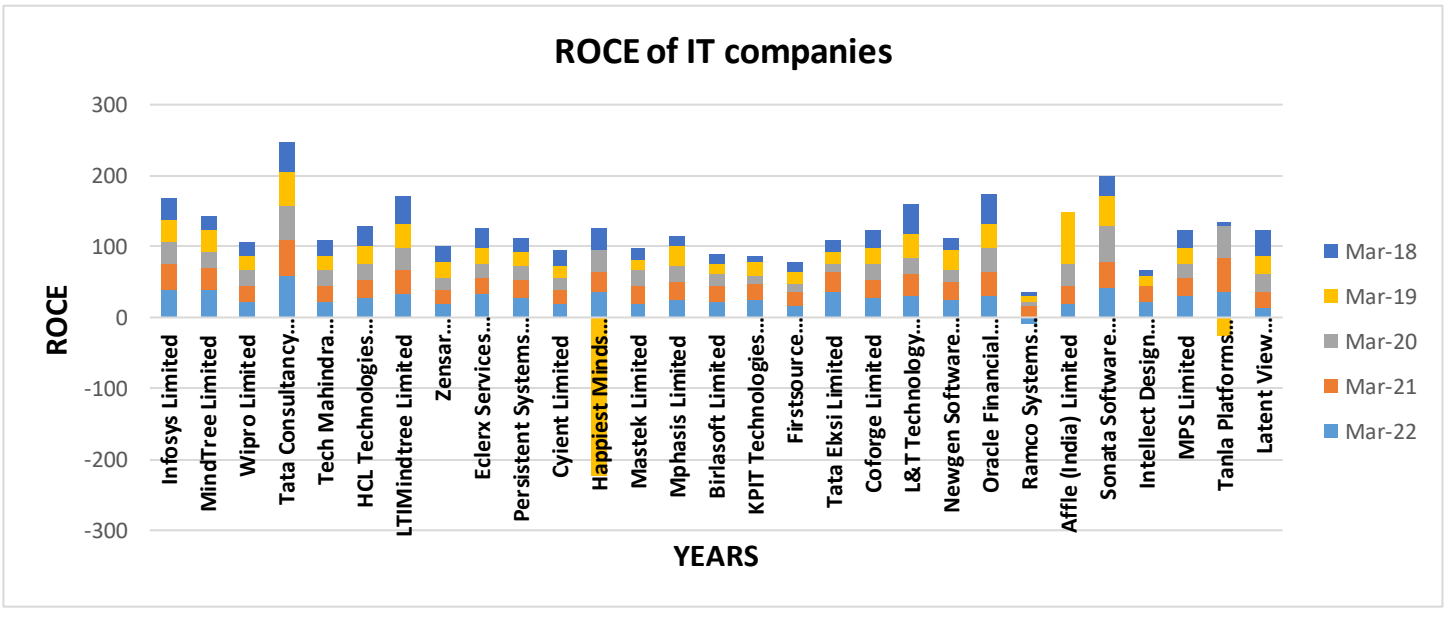
Overall, the graph gives an idea of how different IT companies have performed in terms of generating profits from shareholder investments over the past five years.

## *INDEPENDENT VARIABLE: ROCE*

***Table 2.2.h ROCE values of IT Companies from FY (2018-22)***

| | Return on Capital Employed (%) | | | | |
|---|---|---|---|---|---|
| **Company Name** | **2022** | **2021** | **2020** | **2019** | **2018** |
| Infosys Limited | 38.79 | 35.96 | 31.73 | 30.83 | 31.83 |
| MindTree Limited | 37.95 | 32.47 | 23 | 29.77 | 20.72 |
| Wipro Limited | 20.43 | 24.1 | 21.76 | 19.97 | 19.91 |
| Tata Consultancy Services Limited | 57.63 | 52.91 | 47.21 | 46 | 44.97 |
| Tech Mahindra Limited | 21.51 | 23.51 | 20.83 | 19.88 | 24.83 |
| HCL Technologies Limited | 27.56 | 24.58 | 23.78 | 24.47 | 27.65 |
| LTIMindtree Limited | 32.98 | 33.19 | 33.02 | 32.11 | 40.58 |
| Zensar Technologies Limited | 20.03 | 19.87 | 17.06 | 22.56 | 21.18 |
| Eclerx Services Limited | 32.91 | 23.27 | 19.87 | 21.49 | 28.25 |
| Persistent Systems Limited | 28.27 | 23.44 | 21.24 | 18.76 | 20.52 |
| Cyient Limited | 18.29 | 20.92 | 15.37 | 16.93 | 22.6 |
| Happiest Minds Technologies Limited | 34.55 | 30 | 31.32 | -224.2 | 31.59 |
| Mastek Limited | 17.74 | 27.85 | 22.21 | 11.97 | 16.98 |
| Mphasis Limited | 25.32 | 23.34 | 24.24 | 26.49 | 14.99 |
| Birlasoft Limited | 23.12 | 19.82 | 16.97 | 15.84 | 13.54 |
| KPIT Technologies Limited | 23.59 | 22.33 | 13.17 | 17.79 | 10.49 |
| Firstsource Solutions Limited | 17.03 | 17.47 | 13.89 | 16.71 | 11.98 |
| Tata Elxsi Limited | 34.67 | 29.17 | 10.4 | 17.07 | 17.04 |
| Coforge Limited | 27.48 | 24.54 | 23.53 | 23.35 | 25.57 |
| L&T Technology Services Limited | 31.22 | 28.71 | 23.72 | 34.82 | 41.3 |
| Newgen Software Technologies Limited | 23.83 | 26.37 | 17.74 | 26.99 | 16.75 |
| Oracle Financial Services Software Limited | 31.56 | 32.79 | 33.59 | 32.5 | 44.71 |
| Ramco Systems Limited | -10.28 | 15.53 | 6.55 | 7.79 | 6.18 |
| Affle (India) Limited | 18.04 | 27.11 | 29.6 | 74.71 | 0 |
| Sonata Software Limited | 40.97 | 36.47 | 50.25 | 43.13 | 28.12 |
| Intellect Design Arena Limited | 22.66 | 20.28 | 2.48 | 13.57 | 8.03 |
| MPS Limited | 30.85 | 23.51 | 21.75 | 22.48 | 24.07 |
| Tanla Platforms Limited | 35.63 | 48.01 | 45.93 | -25.15 | 4.41 |
| Latent View Analytics Limited | 12.82 | 24.33 | 24.65 | 24.61 | 37.36 |

*source: moneycontrol.com*



The above graph provides the Return on Capital Employed (ROCE) percentage for various companies in the IT industry in India. The higher the ROCE, the better the company is performing in terms of capital efficiency.

It represents the ROCE data for the years 2018 to 2022 for 29 companies. Some companies have shown consistent improvement in their ROCE over the years, such as Infosys, Tata Consultancy Services, and Sonata Software. On the other hand, some companies have shown a decline in their ROCE, such as Ramco Systems, Tanla Platforms, and Happiest Minds Technologies.

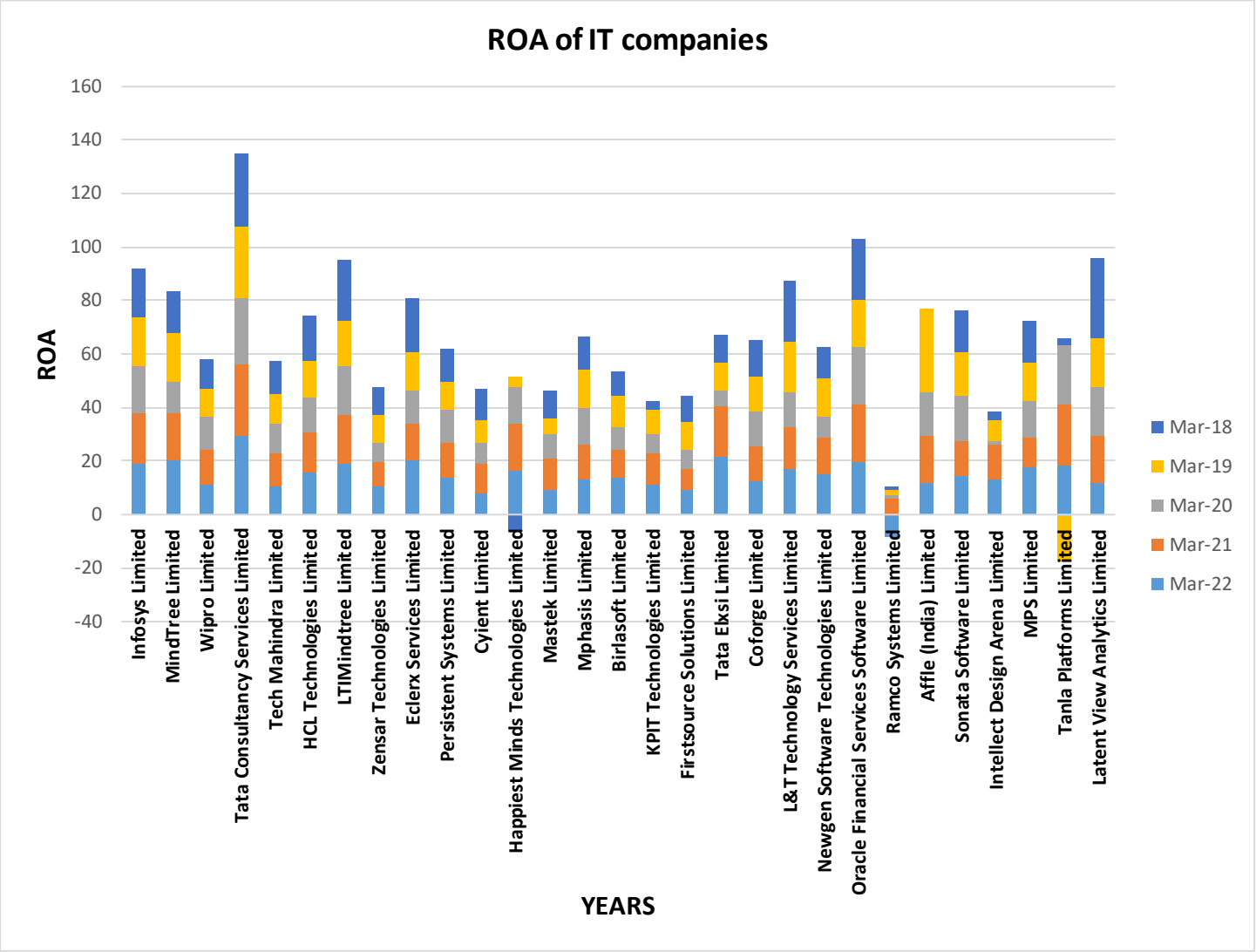
The data in the table can be used by investors, analysts, and other stakeholders to evaluate the financial performance of these companies and make informed investment decisions.

## ***INDEPENDENT VARIABLE: ROA***

***Table 2.2.i ROA values of IT Companies from FY (2018-22)***

| Return on Assets (%) | | | | | |
|---|---|---|---|---|---|
| **Company Name** | **2022** | **2021** | **2020** | **2019** | **2018** |
| Infosys Limited | 19.15 | 18.75 | 17.85 | 17.88 | 18.17 |
| MindTree Limited | 20.26 | 17.45 | 12.23 | 18.04 | 15.25 |
| Wipro Limited | 11.37 | 13.04 | 11.96 | 10.85 | 10.57 |
| Tata Consultancy Services Limited | 29.33 | 27.08 | 24.8 | 26.74 | 27.38 |
| Tech Mahindra Limited | 10.46 | 12.4 | 11.15 | 10.79 | 12.84 |
| HCL Technologies Limited | 15.89 | 15.16 | 12.93 | 13.33 | 17.27 |
| LTIMindtree Limited | 18.76 | 18.41 | 18.07 | 17.22 | 22.72 |
| Zensar Technologies Limited | 10.75 | 8.73 | 7.32 | 10.14 | 10.51 |
| Eclerx Services Limited | 20.16 | 14.07 | 12.03 | 14.29 | 20.26 |
| Persistent Systems Limited | 13.91 | 12.75 | 12.29 | 11 | 12.31 |
| Cyient Limited | 7.85 | 10.91 | 8.09 | 8.19 | 12.3 |
| Happiest Minds Technologies Limited | 16.1 | 17.62 | 14.11 | 3.43 | -5.8 |
| Mastek Limited | 9.32 | 11.86 | 9.11 | 5.72 | 10.28 |
| Mphasis Limited | 13.3 | 12.94 | 13.53 | 14.56 | 11.98 |
| Birlasoft Limited | 13.7 | 10.71 | 8.34 | 11.59 | 9.25 |
| KPIT Technologies Limited | 11.2 | 11.73 | 7.42 | 8.96 | 3.23 |
| Firstsource Solutions Limited | 9.41 | 7.48 | 7.4 | 10.27 | 9.61 |
| Tata Elxsi Limited | 21.91 | 18.6 | 5.86 | 10.33 | 10.77 |
| Coforge Limited | 12.2 | 13.35 | 12.96 | 12.9 | 14.03 |
| L&T Technology Services Limited | 16.91 | 15.71 | 13.07 | 19.02 | 22.75 |
| Newgen Software Technologies Limited | 14.83 | 13.73 | 8.34 | 13.76 | 11.96 |
| Oracle Financial Services Software Limited | 19.47 | 21.62 | 21.26 | 18.22 | 22.6 |
| Ramco Systems Limited | -8.38 | 5.92 | 1.04 | 1.94 | 1.5 |
| Affle (India) Limited | 11.7 | 17.91 | 16.3 | 30.84 | 0 |
| Sonata Software Limited | 14.73 | 12.53 | 17.13 | 16.31 | 15.6 |
| Intellect Design Arena Limited | 13.45 | 12.85 | 0.85 | 8.05 | 3.43 |
| MPS Limited | 17.54 | 11.54 | 13.49 | 14.14 | 15.55 |
| Tanla Platforms Limited | 18.55 | 22.52 | 22.08 | -17.6 | 2.69 |
| Latent View Analytics Limited | 11.77 | 17.61 | 18.3 | 18.43 | 30.02 |

*source: moneycontrol.com*




The above graph generates the Return on Assets (ROA) percentage for various IT companies in India for the years 2018-2022.

The graph shows that Tata Consultancy Services Limited had the highest ROA in 2022 at 29.33%, followed by MindTree Limited at 20.26% and Eclerx Services Limited at 20.16%. On the other hand, Ramco Systems Limited had a negative ROA of -8.38% in 2022.
It is also interesting to note that the ROA of some companies has been fluctuating over the years. For example, Infosys Limited had an ROA of 18.17% in 2018, which increased to 19.15% in 2022. Similarly, Happiest Minds Technologies Limited had a negative ROA of -5.8% in 2020, which increased to 16.1% in 2022.

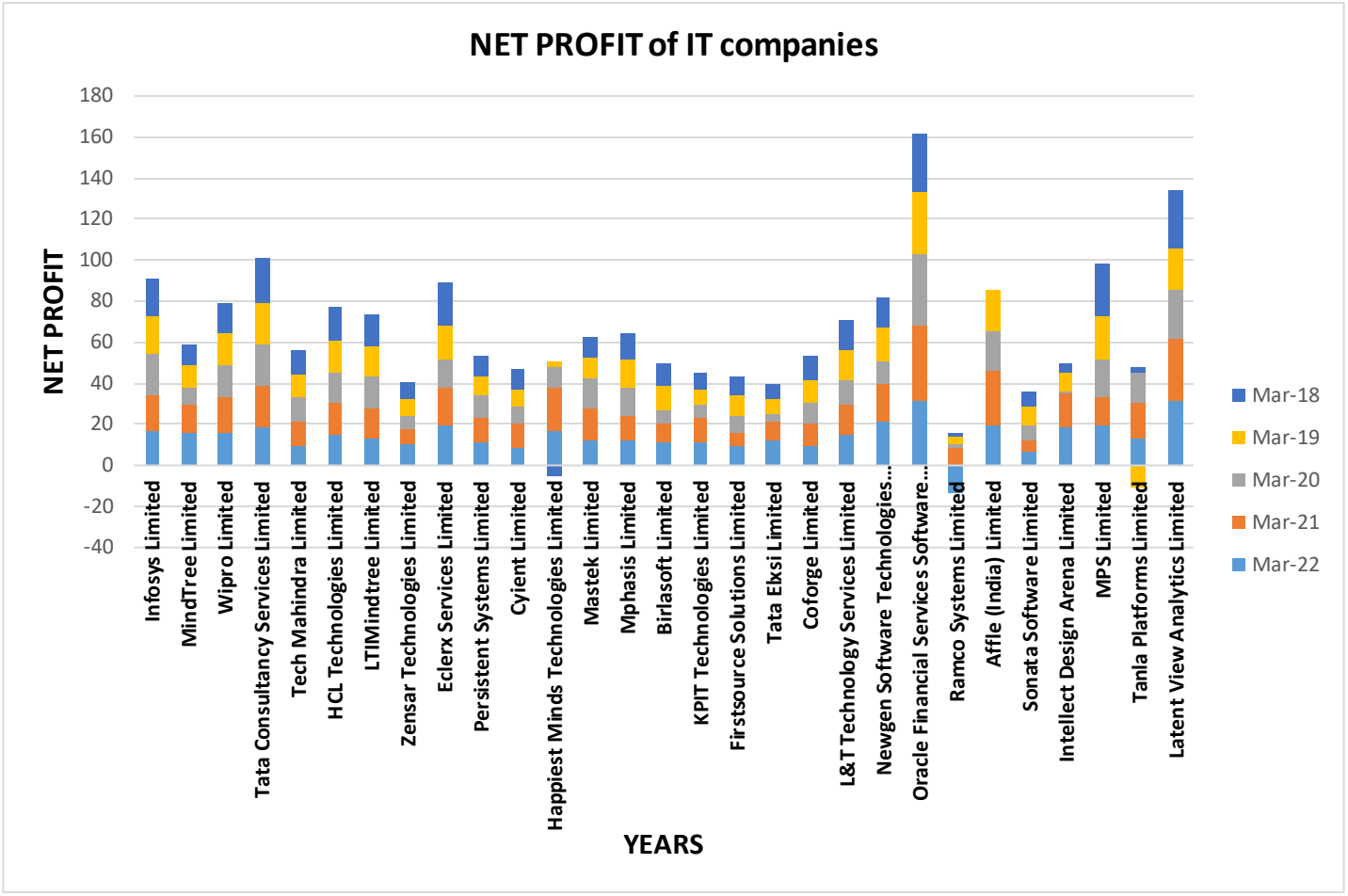
Overall, the table provides insights into the profitability of various IT companies in India and how their ROA has been changing over the years.

## *INDEPENDENT VARIABLE: NET PROFIT*

***Table 2.2.j Net Profit values of IT Companies from FY (2018-22)***

| Net Profit Margin (%) | | | | | |
|---|---|---|---|---|---|
| **Company Name** | **2022** | **2021** | **2020** | **2019** | **2018** |
| Infosys Limited | 16.42 | 18.2 | 19.33 | 18.32 | 18.63 |
| MindTree Limited | 15.7 | 13.93 | 8.12 | 10.73 | 10.43 |
| Wipro Limited | 15.42 | 17.52 | 15.97 | 15.28 | 14.68 |
| Tata Consultancy Services Limited | 18.76 | 20.05 | 19.83 | 20.67 | 21.54 |
| Tech Mahindra Limited | 9.16 | 12.6 | 11.49 | 10.58 | 12.53 |
| HCL Technologies Limited | 14.63 | 15.78 | 14.81 | 15.64 | 16.74 |
| LTIMindtree Limited | 13.29 | 14.66 | 15.66 | 13.97 | 16.04 |
| Zensar Technologies Limited | 9.93 | 8.11 | 6.49 | 8.03 | 7.93 |
| Eclerx Services Limited | 19.33 | 18.07 | 14.53 | 15.95 | 21.24 |
| Persistent Systems Limited | 11.03 | 12.08 | 10.76 | 9.54 | 10.44 |
| Cyient Limited | 8.55 | 11.51 | 8.8 | 7.76 | 10.32 |
| Happiest Minds Technologies Limited | 16.56 | 21 | 10.27 | 2.4 | -4.85 |
| Mastek Limited | 12.1 | 15.26 | 14.62 | 10.62 | 9.82 |
| Mphasis Limited | 11.96 | 12.51 | 13.39 | 13.88 | 12.79 |
| Birlasoft Limited | 11.22 | 9.02 | 6.81 | 11.45 | 11.3 |
| KPIT Technologies Limited | 11.42 | 11.34 | 7.22 | 6.8 | 8.58 |
| Firstsource Solutions Limited | 9.06 | 7.12 | 8.28 | 9.87 | 9.23 |
| Tata Elxsi Limited | 12.01 | 9.32 | 3.59 | 7.18 | 7.81 |
| Coforge Limited | 9.29 | 11.11 | 9.99 | 11.17 | 11.48 |
| L&T Technology Services Limited | 14.65 | 14.62 | 12.23 | 14.63 | 15.13 |
| Newgen Software Technologies Limited | 21.08 | 18.8 | 11 | 16.46 | 14.22 |
| Oracle Financial Services Software Limited | 31.69 | 36.17 | 35.35 | 30.07 | 27.94 |
| Ramco Systems Limited | -13.54 | 8.93 | 1.85 | 3.06 | 2.43 |
| Affle (India) Limited | 19.89 | 26.13 | 19.62 | 19.57 | 0 |
| Sonata Software Limited | 6.77 | 5.76 | 7.39 | 8.4 | 7.82 |
| Intellect Design Arena Limited | 18.37 | 17.1 | 0.84 | 8.81 | 4.72 |
| MPS Limited | 19.4 | 13.85 | 18.04 | 20.97 | 26.29 |
| Tanla Platforms Limited | 13.34 | 16.82 | 15.21 | -10.78 | 3 |
| Latent View Analytics Limited | 31.75 | 29.9 | 23.47 | 20.72 | 28.33 |

*source: moneycontrol.com*




The above graph shows the Net Profit Margin (%) of various IT companies for the years 2018-2022. Net profit margin is a profitability ratio that measures how much profit a company makes for every dollar of revenue generated. It is calculated as net profit divided by revenue, multiplied by 100.

The companies listed include Infosys Limited, MindTree Limited, Wipro Limited, Tata Consultancy Services Limited, Tech Mahindra Limited, HCL Technologies Limited, LTIMindtree Limited, Zensar Technologies Limited, Eclerx Services Limited, Persistent Systems Limited, Cyient Limited, Happiest Minds Technologies Limited, Mastek Limited, Mphasis Limited, Birlasoft Limited, KPIT Technologies Limited, Firstsource Solutions Limited, Tata Elxsi Limited, Coforge Limited, L&T Technology Services Limited, Newgen Software Technologies Limited, Oracle Financial Services Software Limited, Ramco Systems Limited, Affle (India) Limited, Sonata Software Limited, Intellect Design Arena Limited, MPS Limited, Tanla Platforms Limited, and Latent View Analytics Limited.

It can be observed that the net profit margin of these companies varies from year to year. Some companies have maintained a consistently high net profit margin over the years, such as Infosys Limited, Tata Consultancy Services Limited, and Eclerx Services Limited. Other companies, such as MindTree Limited, have shown a fluctuating net profit margin over the years.

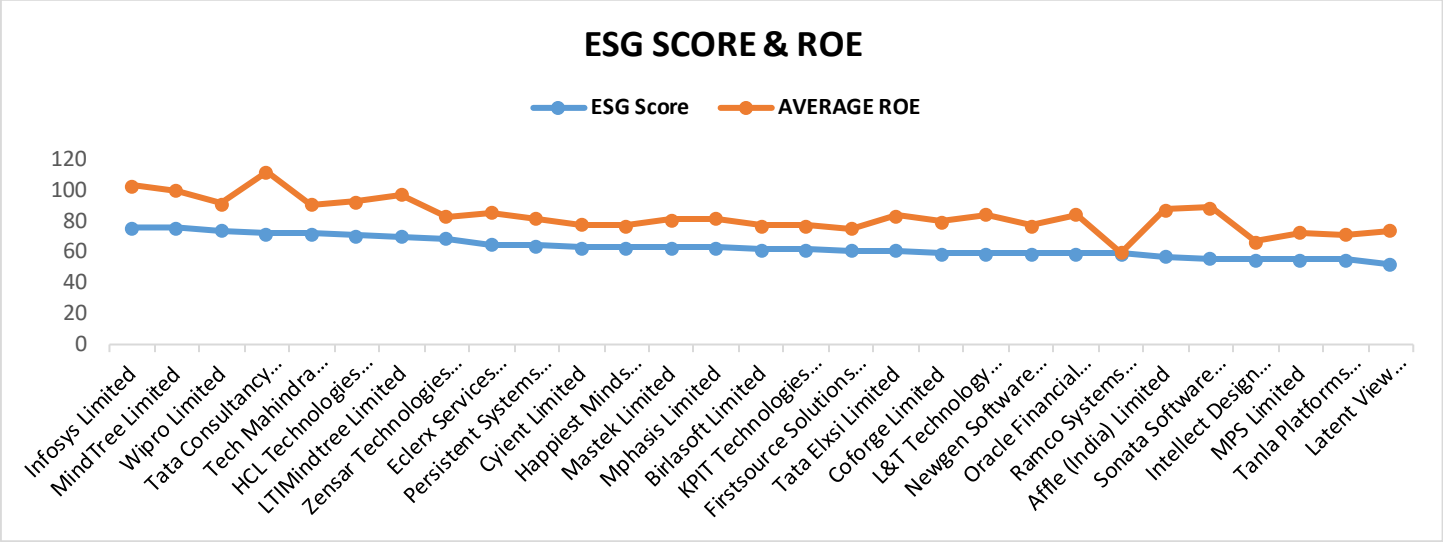
It can also be observed that some companies have negative net profit margins in certain years, such as Happiest Minds Technologies Limited, Ramco Systems Limited, and Tanla Platforms Limited. This indicates that these companies incurred losses during those years.

Overall, the table provides an insight into the financial performance of various IT companies in terms of their net profit margins

## 2.4 RELATIONSHIP BETWEEN SUSTAINABILITY AND FINANCIAL PERFORMANCE OF INFORMATION TECHNOLOGY (IT) SECTOR.

***Table2.4. a Growth performance based on ESG score & ROE by taking an average from FY (2018-22)***

| Company Name | ESG Score | AVERAGE ROE |
|---|---|---|
| Infosys Limited | 76 | 27.14 |
| MindTree Limited | 76 | 23.89 |
| Wipro Limited | 74 | 17.71 |
| Tata Consultancy Services Limited | 72 | 40.15 |
| Tech Mahindra Limited | 72 | 19.09 |
| HCL Technologies Limited | 71 | 21.82 |
| LTIMindtree Limited | 70 | 27.64 |
| Zensar Technologies Limited | 69 | 14.30 |
| Eclerx Services Limited | 65 | 20.41 |
| Persistent Systems Limited | 64 | 17.82 |
| Cyient Limited | 63 | 15.18 |
| Happiest Minds Technologies Limited | 63 | 14.44 |
| Mastek Limited | 63 | 18.09 |
| Mphasis Limited | 63 | 19.05 |
| Birlasoft Limited | 62 | 15.06 |
| KPIT Technologies Limited | 62 | 15.15 |
| Firstsource Solutions Limited | 61 | 14.13 |
| Tata Elxsi Limited | 61 | 22.68 |
| Coforge Limited | 59 | 20.63 |
| L&T Technology Services Limited | 59 | 25.23 |
| Newgen Software Technologies Limited | 59 | 18.20 |
| Oracle Financial Services Software Limited | 59 | 25.37 |
| Ramco Systems Limited | 59 | 0.49 |
| Affle (India) Limited | 57 | 30.35 |
| Sonata Software Limited | 56 | 32.89 |
| Intellect Design Arena Limited | 55 | 11.68 |
| MPS Limited | 55 | 17.66 |
| Tanla Platforms Limited | 55 | 16.64 |
| Latent View Analytics Limited | 52 | 21.94 |



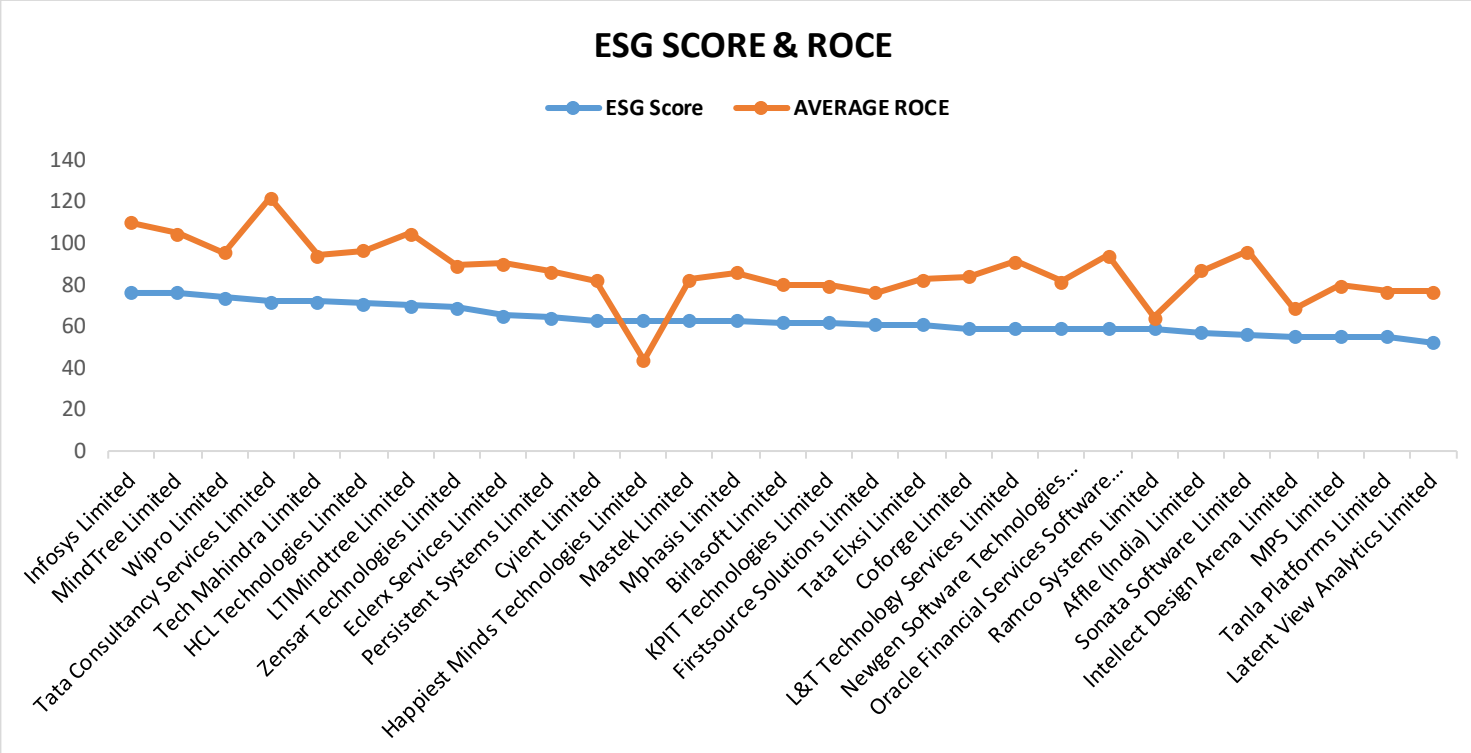

The above graph shows ESG scores and average ROE (return on equity) of various IT companies.

It is observed that Companies with higher ESG scores do not necessarily have higher ROE. Infosys and MindTree have the same ESG score of 76, Infosys has a higher average ROE of 27.14 compared to MindTree's 23.89.
There is a wide range of ESG scores and ROE among the IT companies listed, suggesting that there may be other factors besides ESG performance that influence profitability.
Some companies have relatively low ESG scores and/or ROE, such as Ramco Systems with an ESG score of 59 and an average ROE of 0.49, and Happiest Minds Technologies with an ESG score of 63 and an average ROE of 14.44.
Other companies have relatively high ESG scores and/or ROE, such as Affle (India) with an ESG score of 57 and an average ROE of 30.35, and Sonata Software with an ESG score of 56 and an average ROE of 32.89.
Overall, while ESG performance is important for many stakeholders, it is not the only factor that determines a company's profitability. Companies may need to balance environmental and social responsibility with financial performance to achieve long-term sustainability and success.

***Table 2.4.b Growth performance based on ESG score & ROCE by taking an average from FY (2018-22)***

| Company Name | ESG Score | AVERAGE ROCE |
|---|---|---|
| Infosys Limited | 76 | 33.828 |
| MindTree Limited | 76 | 28.782 |
| Wipro Limited | 74 | 21.234 |
| Tata Consultancy Services Limited | 72 | 49.744 |
| Tech Mahindra Limited | 72 | 22.112 |
| HCL Technologies Limited | 71 | 25.608 |
| LTIMindtree Limited | 70 | 34.376 |
| Zensar Technologies Limited | 69 | 20.14 |
| Eclerx Services Limited | 65 | 25.158 |
| Persistent Systems Limited | 64 | 22.446 |
| Cyient Limited | 63 | 18.822 |
| Happiest Minds Technologies Limited | 63 | -19.348 |
| Mastek Limited | 63 | 19.35 |
| Mphasis Limited | 63 | 22.876 |
| Birlasoft Limited | 62 | 17.858 |

| | | |
|---|---|---|
| KPIT Technologies Limited | 62 | 17.474 |
| Firstsource Solutions Limited | 61 | 15.416 |
| Tata Elxsi Limited | 61 | 21.67 |
| Coforge Limited | 59 | 24.894 |
| L&T Technology Services Limited | 59 | 31.954 |
| Newgen Software Technologies Limited | 59 | 22.336 |
| Oracle Financial Services Software Limited | 59 | 35.03 |
| Ramco Systems Limited | 59 | 5.154 |
| Affle (India) Limited | 57 | 29.892 |
| Sonata Software Limited | 56 | 39.788 |
| Intellect Design Arena Limited | 55 | 13.404 |
| MPS Limited | 55 | 24.532 |
| Tanla Platforms Limited | 55 | 21.766 |
| Latent View Analytics Limited | 52 | 24.754 |




A high ESG score indicates that a company is committed to sustainable business practices, while a high ROCE indicates that a company is generating profits efficiently.

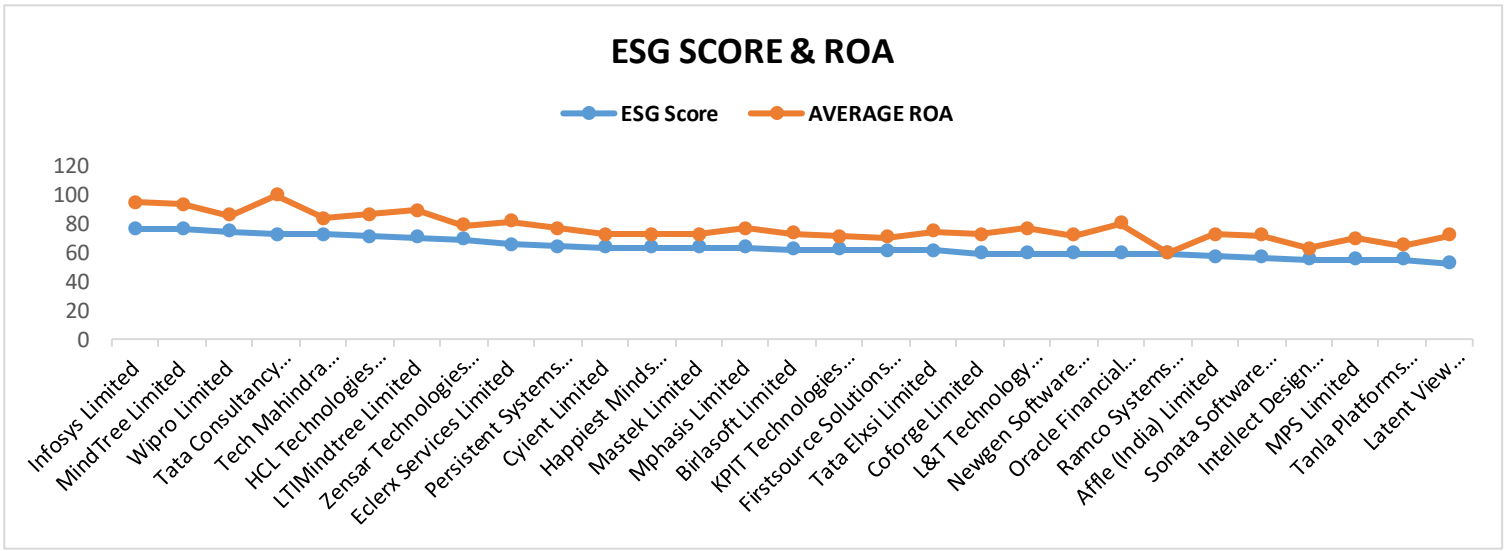
Based on the above chart, it is noticed that companies with higher ESG scores generally have higher ROCE. For example, Infosys, MindTree, and LTIMindtree all have ESG scores of 70 or higher and ROCE values greater than 30%. Similarly, Tata Consultancy Services, which has the highest ROCE value of 49.744%, also has a high ESG score of 72.

On the other hand, there are some companies with low ESG scores and low ROCE values, such as Happiest Minds Technologies and Ramco Systems. These companies may be perceived as having lower levels of social responsibility and sustainability, and their financial performance may suffer as a result.

Overall, there appears to be a positive correlation between ESG scores and ROCE values in the IT companies listed in the table. Companies that prioritize sustainable business practices and social responsibility may be better positioned to generate profits over the long term.

***Table 2.4.c Growth performance based on ESG score & ROA by taking an average from FY (2018-22)***

| Company Name | ESG Score | AVERAGE ROA |
|---|---|---|
| Infosys Limited | 76 | 18.36 |
| MindTree Limited | 76 | 16.646 |
| Wipro Limited | 74 | 11.558 |
| Tata Consultancy Services Limited | 72 | 27.066 |
| Tech Mahindra Limited | 72 | 11.528 |
| HCL Technologies Limited | 71 | 14.916 |
| LTIMindtree Limited | 70 | 19.036 |
| Zensar Technologies Limited | 69 | 9.49 |
| Eclerx Services Limited | 65 | 16.162 |
| Persistent Systems Limited | 64 | 12.452 |
| Cyient Limited | 63 | 9.468 |
| Happiest Minds Technologies Limited | 63 | 9.092 |
| Mastek Limited | 63 | 9.258 |
| Mphasis Limited | 63 | 13.262 |
| Birlasoft Limited | 62 | 10.718 |
| KPIT Technologies Limited | 62 | 8.508 |
| Firstsource Solutions Limited | 61 | 8.834 |
| Tata Elxsi Limited | 61 | 13.494 |
| Coforge Limited | 59 | 13.088 |
| L&T Technology Services Limited | 59 | 17.492 |
| Newgen Software Technologies Limited | 59 | 12.524 |
| Oracle Financial Services Software Limited | 59 | 20.634 |
| Ramco Systems Limited | 59 | 0.404 |
| Affle (India) Limited | 57 | 15.35 |
| Sonata Software Limited | 56 | 15.26 |
| Intellect Design Arena Limited | 55 | 7.726 |
| MPS Limited | 55 | 14.452 |
| Tanla Platforms Limited | 55 | 9.648 |
| Latent View Analytics Limited | 52 | 19.226 |



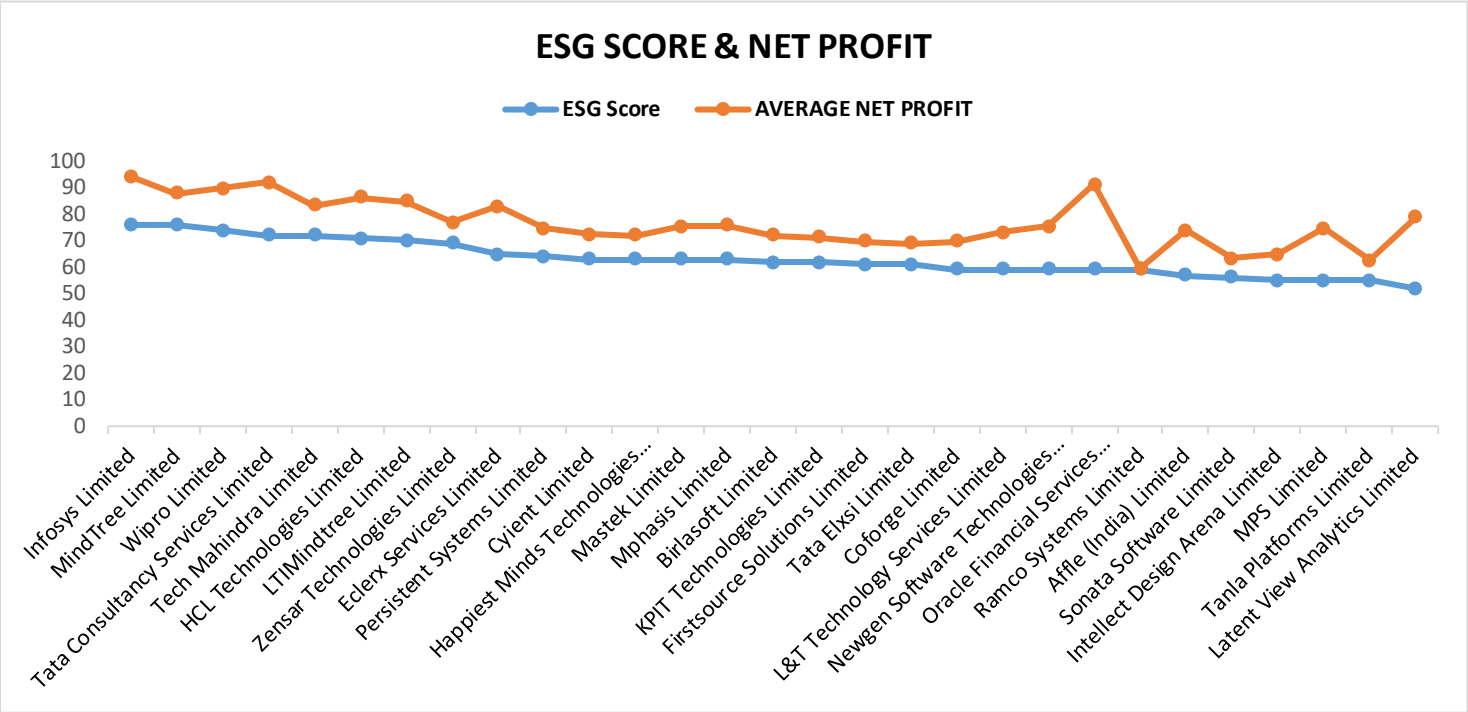
The graph shows that there is a positive correlation between ESG score and ROA. Companies with higher ESG scores tend to have higher ROA, indicating that sustainable and socially responsible business practices can lead to higher profitability.

Among the companies listed, Infosys and MindTree have the highest ESG scores and ROA, indicating that they perform well on both financial and non-financial metrics. On the other hand, Ramco Systems has the lowest ROA, indicating that it is less profitable relative to its assets.

It's important to note that while ROA is a useful metric for evaluating a company's profitability, it does not take into account the external costs and benefits associated with a company's activities. ESG scores provide a more comprehensive view of a company's impact on society and the environment.

***Table 2.4.d Growth performance based on ESG score & Net Profit by taking an average from FY (2018-22)***

| Company Name | ESG Score | AVERAGE NET PROFIT |
|---|---|---|
| Infosys Limited | 76 | 18.18 |
| MindTree Limited | 76 | 11.782 |
| Wipro Limited | 74 | 15.774 |
| Tata Consultancy Services Limited | 72 | 20.17 |
| Tech Mahindra Limited | 72 | 11.272 |
| HCL Technologies Limited | 71 | 15.52 |
| LTIMindtree Limited | 70 | 14.724 |
| Zensar Technologies Limited | 69 | 8.098 |
| Eclerx Services Limited | 65 | 17.824 |
| Persistent Systems Limited | 64 | 10.77 |
| Cyient Limited | 63 | 9.388 |
| Happiest Minds Technologies Limited | 63 | 9.076 |
| Mastek Limited | 63 | 12.484 |
| Mphasis Limited | 63 | 12.906 |
| Birlasoft Limited | 62 | 9.96 |
| KPIT Technologies Limited | 62 | 9.072 |
| Firstsource Solutions Limited | 61 | 8.712 |
| Tata Elxsi Limited | 61 | 7.982 |
| Coforge Limited | 59 | 10.608 |
| L&T Technology Services Limited | 59 | 14.252 |
| Newgen Software Technologies Limited | 59 | 16.312 |
| Oracle Financial Services Software Limited | 59 | 32.244 |
| Ramco Systems Limited | 59 | 0.546 |
| Affle (India) Limited | 57 | 17.042 |
| Sonata Software Limited | 56 | 7.228 |
| Intellect Design Arena Limited | 55 | 9.968 |
| MPS Limited | 55 | 19.71 |
| Tanla Platforms Limited | 55 | 7.518 |
| Latent View Analytics Limited | 52 | 26.834 |




The graph compares the ESG score and average net profit of various IT companies.

Infosys Limited and MindTree Limited have the highest ESG scores of 76, followed by Wipro Limited with a score of 74. On the other hand, Latent View Analytics Limited has the lowest ESG score of 52.

When it comes to average net profit, Oracle Financial Services Software Limited has the highest with 32.244, followed by Latent View Analytics Limited with 26.834 and Infosys Limited with 18.18. Ramco Systems Limited has the lowest net profit of 0.546.

It clearly states that high ESG score does not necessarily translate to high profits. The correlation between ESG score and net profit is not apparent from this graph. However, companies with high ESG scores tend to be more socially responsible and environmentally sustainable, which is a positive indication for investors who are interested in ethical investing.

***OBJECTIVE 2:*** To determine the relationship between sustainability and financial performance indicators such ROE (Return on Equity), ROCE (Return on Capital Employed), Return on Assets (ROA) and Net profit.

**2.2.C SECTOR: FINANCIAL SERVICES**

## *Output Table:1*

# LEAST SQUARE MODEL

Dependent Variable: ESG_SCORE__DV_
Method: Least Square
Date: 04/25/23 Time: 06:35
Sample: 1 17
Included observations: 17

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 57.48963 | 1.603942 | 35.84271 | 0.0000 |
| ROE__IV1_ | 18.29903 | 6.658404 | 2.748260 | 0.0189 |
| ROCE__IV2_ | -14.70592 | 6.059054 | -2.427098 | 0.0336 |
| ROA__IV3_ | 12.54324 | 5.989382 | 2.234543 | 0.0027 |
| NET__PROFIT__IV4_ | -1.090828 | 1.593539 | -0.684531 | 0.5078 |

| | | | |
|---|---|---|---|
| R-squared | 0.427824 | Mean dependent var | 58.20000 |
| Adjusted R-squared | 0.271776 | S.D. dependent var | 3.488757 |
| S.E. of regression | 2.977168 | Akaike info criterion | 5.243000 |
| Sum squared resid | 97.49881 | Schwarz criterion | 5.431814 |
| Log likelihood | -35.32250 | Hannan-Quinn criteria. | 5.240989 |
| F-statistic | 2.741617 | Durbin-Watson stat | 0.459843 |
| Prob(F-statistic) | 0.093791 | | |

As per the objective, the goal is to study the significance of the IV's ROE, ROCE, ROA and Net Profit have in explaining the dependent variable ESG score of a company.

**P-Value Interpretation**

The P-value is used to interpret the statistical significance of a particular statistic or test result in hypothesis testing.
Condition: If P value is < 0.05 then the IV is statistically significant in explaining the DV and if P value is > 0.05 then vice versa at 5% level of significance.

ROE is statistically significant in explaining the DV ESG score of a company at 5% level of significance (P value=0.0189)
ROCE is statistically significant in explaining the DV ESG score of a company at 5% level of significance (P value=0.0336)
ROA is statistically significant in explaining the DV ESG score of a company at 5% level of significance (P value=0.0027)
As per the output generated by the least square model, we can interpret that the Net Profit is not statistically significant in explaining the DV ESG score at 5% level of significance (P value=0.5078)

**T-stat Interpretation**

The T-statistic, also known as the t-value, is a measure of the statistical significance of an estimated coefficient in a regression model. It is calculated as the estimated coefficient divided by its standard

error and it follows a t-distribution with degrees of freedom determined by the sample size and the number of estimated coefficients.

The T-statistic is commonly used in hypothesis testing to assess whether an estimated coefficient is significantly different from zero.

The general interpretation of the t-statistic is as follows:
If the absolute value of the t-statistic is greater than a critical value (e.g., a t-value greater than 1.96 at the 5% significance level for a two-tailed test), then the estimated coefficient is considered statistically significant at that level of significance. This means that there is sufficient evidence to reject the null hypothesis that the true coefficient is zero, and conclude that the estimated coefficient is different from zero.

ROE is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=2.74)
ROCE is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=2.42)
ROA is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=2.23)
As per the output generated by the least square model, we can interpret that the Net Profit is not statistically significant in explaining the DV ESG since the t-stat value generated for Net Profit rate is < 1.98 at 5% level of significance (t-stat value=0.60)

**R square Interpretation**

R-squared, also known as the coefficient of determination, is a measure of how well a regression model explains the variability in the dependent variable. It represents the proportion of the total variation in the dependent variable that is explained by the independent variables in the regression model.

The R square value generated by the least square model is 0.42 which is equal to 42% This indicates that 42% of the variance in the dependent variable ESG score is explained by the independent variables ROE, ROCE, ROA and Net profit.

Since the R square value of the model is 42%, the model is said to be not a fit model.

**F-stat Value interpretation:**

The F-statistic, also known as the F-test, is a statistical test used to assess the overall significance of a regression model in explaining the variability in the dependent variable.

The F stat value generated by the model = 0.09 which indicates that the independent variables are not statistically significant in explaining the DV ESG score. From the output generated it has been noted that Net profit does not play a major role or does not have a great significance in explaining ESG score. ROE, ROA and ROCE are seen to be statistically significant by a large amount in explaining the DV ESG score.

**Durbin Watson statistics interpretation:**

The Durbin-Watson statistic is a measure of autocorrelation, or the presence of serial correlation, in the residuals of a regression model. It is often used to test for the presence of autocorrelation in time series or panel data analysis, including in pooled OLS regression models.

The Durbin-Watson statistic ranges from 0 to 4, with values around 2 indicating no autocorrelation, values below 2 indicating positive autocorrelation, and values above 2 indicating negative autocorrelation.

The Durbin Watson stat value generated by the least square model is 0.49, since the value is < 2 it indicates that there is a positive auto correlation among the variables.
From the above interpretation we can conclude that the least square model is not a fit model in explaining the relationship among the DV-ESG score and IVs ROE, ROCE and Net profit.

We now make use of the two stage least square model to study if this model is able to determine the relationship between ESG score and ROR. ROCE and Net profit.

## *Output Table:2*

## TWO STAGE LEAST SQUARE MODEL

Dependent Variable: ESG_SCORE__DV_
Method: Two-Stage Least Squares
Date: 04/25/23 Time: 06:40
Sample: 1 17
Included observations: 17
Instrument specification: ESG_SCORE__DV_ ROCE__IV2_ ROE__IV1_ROA__IV3_ NET_PROFIT__IV4_
Constant added to instrument list

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 57.48963 | 1.603942 | 35.84271 | 0.0000 |
| ROE__IV1_ | 18.29903 | 6.658404 | 2.748260 | 0.0189 |
| ROCE__IV2_ | -14.70592 | 6.059054 | -2.427098 | 0.0336 |
| ROA__IV3_ | 12.54324 | 5.989382 | 2.234543 | 0.0027 |
| NET__PROFIT__IV4_ | -1.090828 | 1.593539 | -0.684531 | 0.5078 |

| | | | |
|---|---|---|---|
| R-squared | 0.427824 | Mean dependent var | 58.20000 |
| Adjusted R-squared | 0.271776 | S.D. dependent var | 3.488757 |
| S.E. of regression | 2.977168 | Sum squared resid | 97.49881 |
| F-statistic | 2.741617 | Durbin-Watson stat | 0.459843 |
| Prob(F-statistic) | 0.093791 | Second-Stage SSR | 97.49881 |
| J-statistic | 11.00000 | Instrument rank | 5 |
| Prob(J-statistic) | 0.000911 | | |

Over here all the interpretation will be the same as what was done in the least square model. The only indicator that we analyze is the J-statistics value.

The J-stat value generated by the Two stage least square = 0.000911, this indicates that that the model is a good fit to determine the relationship between ESG score and ROE, ROCE, ROA and Net Profit.

## *Output Table:*

## GMM MODEL

Dependent Variable: ESG_SCORE__DV_
Method: Generalized Method of Moments
Date: 04/25/23 Time: 06:49
Sample: 1 17
Included observations: 17
Linear estimation with 1 weight update
Estimation weighting matrix: HAC (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)
Standard errors & covariance computed using estimation weighting matrix
Instrument specification: ESG_SCORE__DV_ ROE__IV1_ ROCE__IV2_ROA__IV3_NET_PROFIT__IV4_
Constant added to instrument list

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 56.12191 | 1.605845 | 34.94852 | 0.0000 |
| ROCE__IV2_ | -15.61173 | 3.973966 | -3.928501 | 0.0024 |
| ROE__IV1_ | 20.69910 | 4.024437 | 5.143353 | 0.0003 |
| ROA__IV3_ | 18.76252 | 3.362726 | 2.456367 | 0.0232 |
| NET_PROFIT__IV4_ | -0.745954 | 1.327232 | -0.562037 | 0.5854 |

| | | | |
|---|---|---|---|
| R-squared | 0.855559 | Mean dependent var | 58.20000 |
| Adjusted R-squared | 0.879802 | S.D. dependent var | 3.488757 |
| S.E. of regression | 3.159586 | Sum squared resid | 109.8128 |
| Durbin-Watson stat | 0.454009 | J-statistic | 3.242069 |
| Instrument rank | 5 | Prob(J-statistic) | 0.071770 |

**P-Value Interpretation**

If P value is < 0.05 then the IV is statistically significant in explaining the DV and if Value is > 0.05 then vice versa.

ROE is statistically significant in explaining the DV ESG score of a company at 5% level of significance (p value=0.0024)
ROCE is statistically significant in explaining the DV ESG score of a company at 5% level of significance (p value=0.0003)
ROA is statistically significant in explaining the DV ESG score of a company at 5% level of significance (p value=0.0232)
As per the output generated by the least square model, we can interpret that the net profit is not statistically significant in explaining the DV ESG score at 5% level of significance (P Value=0.5854)
From this we can interpret that the GMM model proves that the independent variable ROE, ROCE and ROA are statistically significant in explaining the dependent variable ESG score and the IV- net profit does not play a major role in determining the ESG score of the companies.

**T-stat Interpretation:**

The condition for t-stat is that the value generated by the model is > 1.98 at 5% level of significance then this indicates that the IV is significant in explaining the DV.
ROE is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=3.91)
ROCE is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=5.14)

ROA is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=2.45)

As per the output generated by the least square model, we can interpret that the Net profit rate is not statistically significant in explaining the DV ESG since the t-stat value generated for Net profit rate is < 1.98 at 5% level of significance (t-stat value=0.56)

**R squared interpretation:**

The R square value generated by the least square model is 0.85 which is equal to 85% This indicates that 85% of the variance in the dependent variable ESG score is explained by the independent variables ROE, ROCE and Net profit.

Since the R squared value of the model is 85%, the model is said to be a fit model.

The J-stat value generated by the Two stage least square = 0.071, this indicates that that the model is a good fit to determine the relationship between ESG score and ROE, ROA, ROCE and Net Profit. Hence, we can say that since the model is said to be fit the conclusion, we can draw from this model is that ROE and ROCE play a major role and are significant in determining the ESG score of the company but Net profit on the other hand has no significance in determining the ESG score.

**MODEL DIAGNOSTICS TEST**

1. Heteroscedasticity
2. Auto correlation
3. Multicollinearity

## *Output Table:4*

**HETROSCEDASTICITY**

Heteroskedasticity Test: Breusch-Pagan-Godfrey

| | | | |
|---|---|---|---|
| F-statistic | 0.709206 | Prob. F (3,11) | 0.5664 |
| Obs*R-squared | 2.431078 | Prob. Chi-Square (3) | 0.4879 |
| Scaled explained SS | 0.866973 | Prob. Chi-Square (3) | 0.8334 |

Test Equation

Dependent Variable: RESID^2
Method: Least Squares
Date: 04/25/23 Time: 06:58
Sample: 1 17
Included observations: 17
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 10.38146 | 5.074426 | 2.045840 | 0.0654 |
| NET_PROFIT__V4_ | -4.825701 | 3.392792 | -1.422339 | 0.1827 |
| ROE__IV1_ | -7.306654 | 15.50480 | -0.471251 | 0.6467 |
| ROCE__IV2_ | -0.963788 | 10.40304 | -0.092645 | 0.9279 |
| ROA__IV3_ | 8.564738 | 14.36722 | -0.673829 | 0.2838 |

| | | | |
|---|---|---|---|
| R-squared | 0.162072 | Mean dependent var | 6.499920 |
| Adjusted R-squared | -0.066454 | S.D. dependent var | 7.748302 |
| S.E. of regression | 8.001614 | Akaike info criterion | 7.220342 |

| | | | |
|---|---|---|---|
| Sum squared resid | 704.2841 | Schwarz criterion | 7.409155 |
| Log likelihood | -50.15256 | Hannan-Quinn criter. | 7.218331 |
| F-statistic | 0.709206 | Durbin-Watson stat | 1.267109 |
| Prob(F-statistic) | 0.566417 | | |

***A significance test is carried out to detect heteroscedasticity***.
over here we analyze the P Value that is generated. The P-value generated by the model = 0.48, since the value is > 0.05 this indicates that no heteroscedastic problem exists and the variables are significant.

Heteroskedasticity Test: White

| | | | |
|---|---|---|---|
| F-statistic | 0.460958 | Prob. F (9,5) | 0.8524 |
| Obs*R-squared | 6.802045 | Prob. Chi-Square (9) | 0.6577 |
| Scaled explained SS | 2.425750 | Prob. Chi-Square (9) | 0.9828 |

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/25/23 Time: 06:59
Sample: 1 15
Included observations: 15
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 9.674764 | 26.00582 | 0.372023 | 0.7251 |
| NET_PROFIT__IV4_^2 | -2.595201 | 8.262302 | -0.314102 | 0.7661 |
| NET_PROFIT__IV4_*ROE__IV1_ | 94.01037 | 228.7846 | 0.410912 | 0.6982 |
| NET_PROFIT__IV4_*ROCE__IV2_ | -101.9403 | 181.8577 | -0.560550 | 0.5993 |
| NET_PROFIT__IV4_ | -10.08465 | 23.84351 | -0.422952 | 0.6899 |
| ROE__IV1_^2 | -29.60327 | 480.4031 | -0.061622 | 0.9533 |
| ROE__IV1_*ROCE__IV2_ | 295.5884 | 1142.372 | 0.258750 | 0.8061 |
| ROE__IV1_ | -97.82663 | 189.0337 | -0.517509 | 0.6269 |
| ROA__IV3_ | 111.3562 | 356.2833 | 0.432322 | 0.2343 |
| ROCE__IV2_^2 | -253.5451 | 644.2471 | -0.393553 | 0.7101 |
| ROCE__IV2_ | 107.9440 | 152.7123 | 0.706846 | 0.5112 |

| | | | |
|---|---|---|---|
| R-squared | 0.453470 | Mean dependent var | 6.499920 |
| Adjusted R-squared | -0.530285 | S.D. dependent var | 7.748302 |
| S.E. of regression | 9.585012 | Akaike info criterion | 7.592999 |
| Sum squared resid | 459.3623 | Schwarz criterion | 8.065033 |
| Log likelihood | -46.94750 | Hannan-Quinn criter. | 7.587971 |
| F-statistic | 0.460958 | Durbin-Watson stat | 1.428175 |
| Prob(F-statistic) | 0.852375 | | |

## *Output Table:5*

**AUTOCORRELATION:BG TEST-**

Breusch-Godfrey Serial Correlation LM Test:

| | | | |
|---|---|---|---|
| F-statistic | 21.06828 | Prob. F (1,10) | 0.0010 |
| Obs*R-squared | 10.17192 | Prob. Chi-Square (1) | 0.0014 |

Test Equation:
Dependent Variable: RESID
Method: Least Squares

Date: 04/25/23 Time: 07:04
Sample: 1 15
Included observations: 15
Pre sample missing value lagged residuals set to zero.

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -1.153847 | 0.986942 | -1.169113 | 0.2695 |
| NET_PROFIT__IV4_ | 1.881892 | 1.033046 | 1.821693 | 0.0985 |
| ROE__IV1_ | 1.088115 | 3.969026 | 0.274152 | 0.7895 |
| ROCE__IV2_ | 0.186781 | 3.605539 | 0.051804 | 0.9597 |
| ROA__IV3_ | 1.356266 | 2.989288 | 0.343223 | 0.6728 |
| RESID (-1) | 0.977829 | 0.213034 | 4.590019 | 0.0010 |

| | | | |
|---|---|---|---|
| R-squared | 0.678128 | Mean dependent var | 9.65E-15 |
| Adjusted R-squared | 0.549380 | S.D. dependent var | 2.638977 |
| S.E. of regression | 1.771500 | Akaike info criterion | 4.242732 |
| Sum squared resid | 31.38211 | Schwarz criterion | 4.478748 |
| Log likelihood | -26.82049 | Hannan-Quinn criter. | 4.240217 |
| F-statistic | 5.267069 | Durbin-Watson stat | 1.993351 |
| Prob(F-statistic) | 0.015168 | | |

the model has generated 1.99 for Durbin Watson stat since the value is close to 2 this indicates that there exists no auto correlation problem among the variables.

## *Output Table:6*

**MULTICOLLINEARITY TEST**

Variance Inflation Factors
Date: 04/25/23 Time: 07:03
Sample: 1 15
Included observations: 15

| Variable | Coefficient Variance | Uncentered VIF | Centered VIF |
|---|---|---|---|
| C | 3.365550 | 4.376782 | NA |
| NET_PROFIT__IV 4_ | 1.811570 | 1.889643 | 9.974184 |
| ROE__IV1_ | 18.61894 | 12.16424 | 4.689155 |
| ROCE__IV2_ | 16.13751 | 11.32145 | 5.057496 |
| ROA__IV3_ | 18.92829 | 10.45627 | 3.82928 |

This model tells us which independent variable needs to be excluded from the regression model and which variable has no significance to the DV- ESG score.

When Centered VIF value of the variable is 10 or more, it indicates that multicollinearity problem exists and that particular variable is not significant.

As we can see the centered VIF value of net profit = 9.97 which is approximately close to 10, this means this variable is not significant to be a part of the regression model or equation.

SUMMARY:
From the above interpretation and analysis conducted we can conclude that ROE, ROCE and ROA of a company play an important role in determining the ESG score of a company while Net profit is not a variable that has a significance or importance in deriving the ESG score.

## SECTOR: INFORMATION TECHNOLOGY (IT)

### *Output Table:1*

## LEAST SQUARE MODEL

Dependent Variable: ESG_SCORE_RANKING
Method: Least Squares
Date: 04/25/23 Time: 07:53
Sample: 1 15
Included observations: 15

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 66.89479 | 5.398668 | 12.39098 | 0.0000 |
| ROE | -36.22506 | 68.68356 | -2.527420 | 0.0484 |
| ROCE | 35.05392 | 49.04825 | 2.714682 | 0.0297 |
| ROA | 37.37289 | 53.62535 | 2.456277 | 0.0187 |
| NET_PROFIT | -2.506243 | 1.916375 | -1.937804 | 0.1176 |

| | | | |
|---|---|---|---|
| R-squared | 0.862534 | Mean dependent var | 67.66667 |
| Adjusted R-squared | 0.910953 | S.D. dependent var | 5.354126 |
| S.E. of regression | 5.102028 | Akaike info criterion | 6.320332 |
| Sum squared resid | 286.3376 | Schwarz criterion | 6.509145 |
| Log likelihood | -43.40249 | Hannan-Quinn criter. | 6.318320 |
| F-statistic | 1.472567 | Durbin-Watson stat | 2.726746 |
| Prob(F-statistic) | 0.078643 | | |

As per objective the goal is to study the significance the IVs ROE, ROCE, ROA and Net profit have in explaining the dependent variable ESG score of a company.

**P-Value Interpretation**

The p-value is used to interpret the statistical significance of a particular statistic or test result in hypothesis testing.

CONDITION: If Pvalue is < 0.05 then the IV is statistically significant in explaining the DV and if Pvalue is > 0.05 then vice versa.
ROE is statistically significant in explaining the DV ESG score of a company at 5% level of significance (p value=0.048)
ROCE is statistically significant in explaining the DV ESG score of a company at 5% level of significance (p value=0.029)
ROA is statistically significant in explaining the DV ESG score of a company at 5% level of significance (p value=0.0187)

As per the output generated by the least square model, we can interpret that the net profit is not statistically significant in explaining the DV ESG score at 5% level of significance (pvalue=0.117)

**T-stat Interpretation**

ROE is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=2.52)
ROCE is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=2.71)
ROA is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=2.45)

As per the output generated by the least square model, we can interpret that the profit growth rate is not statistically significant in explaining the DV ESG since the t-stat value generated for net profit is < 1.98 at 5% level of significance (t-stat value=1.93)

**R squared interpretation**

The R square value generated by the least square model is 0.86 which is equal to 86% This indicates that 86% of the variance in the dependent variable ESG score is explained by the independent variables ROE, ROCE and profit growth.
Since the R squared value of the model is 86%, the model is said to be a fit model.

**F-stat value interpretation**

The f stat value generated by the model = 0.078 which indicates that the independent variables are not statistically significant in explaining the DV ESG score.
From the output generated it has been noted that net profit does not play a major role or does not have a great significance in explaining ESG score.
ROE ROCE and ROA are seen to be statistically significant by a large amount in explaining the DV ESG score.

**Durbin Watson Statistics Interpretation**

The Durbin-Watson statistic ranges from 0 to 4, with values around 2 indicating no autocorrelation, values below 2 indicating positive autocorrelation, and values above 2 indicating negative autocorrelation.
The Durbin Watson stat value generated by the least square model is 2.72, since the value is > 2 it indicates that there is a negative auto correlation among the variables.
From the above interpretation we can conclude that the least square model is not a fit model in explaining the relationship among the DV-ESG score and IVs ROE, ROCE, ROA and Net Profit.
We now make use of the two stage least square model to study if this model is able to determine the relationship between ESG score and ROR. ROCE and profit growth.

## *Output Table:2*

## TWO STAGE LEAST SQUARE MODEL

Dependent Variable: ESG_SCORE_RANKING
Method: Two-Stage Least Squares
Date: 04/25/23 Time: 07:54
Sample: 1 15
Included observations: 15
Instrument specification: ESG_SCORE_RANKING ROE ROCE PROFIT_GROWTH
Constant added to instrument list

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 66.89479 | 5.398668 | 12.39098 | 0.0000 |
| ROE | -36.22506 | 68.68356 | -2.527420 | 0.0484 |
| ROCE | 35.05392 | 49.04825 | 2.714682 | 0.0297 |
| ROA | 37.37289 | 53.62535 | 2.456277 | 0.0187 |
| NET_PROFIT | -2.506243 | 1.916375 | -1.937804 | 0.1176 |

| | | | |
|---|---|---|---|
| R-squared | 0.286534 | Mean dependent var | 67.66667 |
| Adjusted R-squared | 0.091953 | S.D. dependent var | 5.354126 |
| S.E. of regression | 5.102028 | Sum squared resid | 286.3376 |
| F-statistic | 1.472567 | Durbin-Watson stat | 0.726746 |
| Prob(F-statistic) | 0.275643 | Second-Stage SSR | 286.3376 |
| J-statistic | 11.00000 | Instrument rank | 5 |
| Prob(J-statistic) | 0.000911 | | |

Over here all the interpretation will be the same as what was done in the least square model. The only indicator that we analyze is the J-statistics value.
The J-stat value generated by the Two stage least square = 0.000911, this indicates that that the model is a good fit to determine the relationship between ESG score and ROE, ROCE, ROA and net profit.

## *Output Table:3*

# GMM MODEL

Dependent Variable: ESG_SCORE_RANKING
Method: Generalized Method of Moments
Date: 04/25/23 Time: 07:57
Sample: 1 15
Included observations: 15
Linear estimation with 1 weight update
Estimation weighting matrix: HAC (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)
Standard errors & covariance computed using estimation weighting matrix
Instrument specification: ESG_SCORE_RANKING ROE ROCE ROA NET_PROFIT
Constant added to instrument list

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 65.89076 | 4.368350 | 15.08367 | 0.0000 |
| ROE | -42.62123 | 62.82250 | -2.678439 | 0.0115 |
| ROCE | 39.90057 | 47.81601 | 2.834460 | 0.0218 |
| ROA | 22.56282 | 53.72899 | 1.992822 | 0.0456 |
| NET_PROFIT | -2.128087 | 1.764939 | -1.205757 | 0.1082 |

| | | | |
|---|---|---|---|
| R-squared | 0.755529 | Mean dependent var | 67.66667 |
| Adjusted R-squared | 0.052491 | S.D. dependent var | 5.354126 |
| S.E. of regression | 5.211710 | Sum squared resid | 298.7812 |
| Durbin-Watson stat | 0.583008 | J-statistic | 4.293570 |
| Instrument rank | 5 | Prob(J-statistic) | 0.038257 |

**P-value interpretation**

CONDITION: If Pvalue is < 0.05 then the IV is statistically significant in explaining the DV and if Pvalue is > 0.05 then vice versa.

ROE is statistically significant in explaining the DV ESG score of a company at 5% level of significance (p value=0.0115)
ROCE is statistically significant in explaining the DV ESG score of a company at 5% level of significance (p value=0.021)
ROA is statistically significant in explaining the DV ESG score of a company at 5% level of significance (p value=0.04)

As per the output generated by the least square model, we can interpret that the net profit is not statistically significant in explaining the DV ESG score at 5% level of significance (pvalue=0.108)

From this we can interpret that the GMM model proves that the independent variable ROE ROCE ROA are statistically significant in explaining the dependent variable ESG score and the IV - net profit does not play a major role in determining the ESG score of the companies.

**T-stat interpretation**

The condition for t-stat is that the value generated by the model is > 1.98 at 5% level of significance then this indicates that the IV is significant in explaining the DV.

ROE is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=2.67)
ROCE is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=2.83)
ROA is statistically significant in explaining the DV ESG score of a company since the t-stat value is > 1.98 at 5% level of significance (t-stat value=1.99)

As per the output generated by the least square model, we can interpret that the Net profit is not statistically significant in explaining the DV ESG since the t-stat value generated for net profit is < 1.98 at 5% level of significance (t-stat value=1.20)

**R squared interpretation**

The R square value generated by the least square model is 0.75 which is equal to 75% This indicates that 75% of the variance in the dependent variable ESG score is explained by the independent variables ROE, ROCE and profit growth.

Since the R squared value of the model is 75%, the model is said to be a fit model.

# MODEL DIAGNOSTIC TEST

## *Output Table:4*

## 1. HETEROSCEDASTICITY

Heteroskedasticity Test: Breusch-Pagan-Godfrey

| | | | |
|---|---|---|---|
| F-statistic | 0.481500 | Prob. F (3,11) | 0.7018 |
| Obs*R-squared | 1.741132 | Prob. Chi-Square (3) | 0.6278 |
| Scaled explained SS | 0.276513 | Prob. Chi-Square (3) | 0.9644 |

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/25/23 Time: 07:56
Sample: 1 15
Included observations: 15

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 31.67695 | 17.04290 | 1.858660 | 0.0900 |
| ROE | -30.68645 | 216.8251 | -0.141526 | 0.8900 |
| ROCE | -1.351276 | 154.8390 | -0.008727 | 0.9932 |
| ROA | -2.345622 | 110.4516 | -0.009826 | 0.8782 |
| NET_PROFIT | -7.268100 | 6.049750 | -1.201388 | 0.2548 |

| | | | |
|---|---|---|---|
| R-squared | 0.116075 | Mean dependent var | 19.08917 |
| Adjusted R-squared | -0.124995 | S.D. dependent var | 15.18534 |
| S.E. of regression | 16.10644 | Akaike info criterion | 8.619494 |
| Sum squared resid | 2853.593 | Schwarz criterion | 8.808308 |
| Log likelihood | -60.64621 | Hannan-Quinn criter. | 8.617483 |
| F-statistic | 0.481500 | Durbin-Watson stat | 1.054723 |
| Prob(F-statistic) | 0.701778 | | |

Pvalue that is generated. The pvalue generated by the model = 0.62, since the value is > 0.05 this indicates that no heteroscedastic problem exists and the variables are significant.

Heteroskedasticity Test: White

| | | | |
|---|---|---|---|
| F-statistic | 1.248127 | Prob. F (9,5) | 0.4241 |
| Obs*R-squared | 10.37982 | Prob. Chi-Square (9) | 0.3206 |
| Scaled explained SS | 1.648444 | Prob. Chi-Square (9) | 0.9959 |

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/25/23 Time: 07:56
Sample: 1 15
Included observations: 15

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -130.9276 | 70.55023 | -1.855807 | 0.1226 |
| ROE^2 | -1039.127 | 9712.118 | -0.106993 | 0.9190 |
| ROE*ROCE | -8050.058 | 18996.91 | -0.423756 | 0.6894 |
| ROE*NET_PROFIT | -1355.258 | 1076.834 | -1.258557 | 0.2638 |
| ROE | 3229.992 | 1942.270 | 1.662998 | 0.1572 |
| ROCE^2 | 5815.859 | 9065.867 | 0.641512 | 0.5494 |
| ROCE*NET_PROFIT | 323.8020 | 876.3772 | 0.369478 | 0.7269 |
| ROCE | -1678.851 | 1387.220 | -1.210227 | 0.2803 |
| ROA | 122.8277 | 176.2827 | 1.254244 | 0.3625 |
| NET_PROFIT^2 | -30.59846 | 23.40417 | -1.307393 | 0.2480 |
| NET_PROFIT | 239.7490 | 159.3411 | 1.504628 | 0.1928 |

| | | | |
|---|---|---|---|
| R-squared | 0.691988 | Mean dependent var | 19.08917 |
| Adjusted R-squared | 0.137567 | S.D. dependent var | 15.18534 |
| S.E. of regression | 14.10221 | Akaike info criterion | 8.365261 |
| Sum squared resid | 994.3614 | Schwarz criterion | 8.837294 |
| Log likelihood | -52.73946 | Hannan-Quinn criter. | 8.360233 |
| F-statistic | 1.248127 | Durbin-Watson stat | 2.110388 |
| Prob(F-statistic) | 0.424126 | | |

***Output Table: 5***

# 2. AUTOCORRELATION

Breusch-Godfrey Serial Correlation LM Test:

| | | | |
|---|---|---|---|
| F-statistic | 4.804879 | Prob. F (2,9) | 0.0380 |
| Obs*R-squared | 7.745741 | Prob. Chi-Square (2) | 0.0208 |

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 04/25/23 Time: 07:59
Sample: 1 15
Included observations: 15
Presample missing value lagged residuals set to zero.

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -0.741365 | 4.170303 | -0.177772 | 0.8628 |
| ROE | -18.50358 | 55.23126 | -0.335020 | 0.7453 |
| ROCE | 10.85482 | 39.93798 | 0.271792 | 0.7919 |
| ROA | 9.545242 | 44.32728 | 0.567288 | 0.7288 |
| PROFIT_GROWTH | 2.728599 | 1.730595 | 1.576683 | 0.1493 |
| RESID (-1) | 0.815561 | 0.352061 | 2.316532 | 0.0457 |
| RESID (-2) | 0.231861 | 0.320052 | 0.724448 | 0.4872 |

| | | | |
|---|---|---|---|
| R-squared | 0.516383 | Mean dependent var | -2.66E-15 |
| Adjusted R-squared | 0.247707 | S.D. dependent var | 4.522464 |
| S.E. of regression | 3.922553 | Akaike info criterion | 5.860537 |
| Sum squared resid | 138.4778 | Schwarz criterion | 6.143757 |
| Log likelihood | -37.95403 | Hannan-Quinn criter. | 5.857520 |
| F-statistic | 1.921952 | Durbin-Watson stat | 2.128617 |
| Prob(F-statistic) | 0.185919 | | |

The model has generated 2.12 for Durbin Watson stat since the value is close to 2 this indicates that there exists no auto correlation problem among the variables.

*Output Table:6*

## 3. MULTICOLLINEARITY

Variance Inflation Factors
Date: 04/25/23 Time: 08:00
Sample: 1 15
Included observations: 15

| Variable | Coefficient Variance | Uncentered VIF | Centered VIF |
|---|---|---|---|
| C | 29.14562 | 16.79496 | NA |
| ROE | 4717.431 | 208.0809 | 8.60530 |
| ROCE | 2405.731 | 174.6347 | 7.42425 |
| ROA | 365.282 | 223.456 | 6.98493 |
| PROFIT_GROWTH | 3.672494 | 1.962434 | 5.296073 |

When Centered VIF value of the variable is 10 or more, it indicates that multicollinearity problem exists and that particular variable is not significant.

In this case the Centered VIF value of all the variable are below 10 that indicates that no multicollinearity problem exists among the variable.

SUMMARY

From the above interpretation and analysis conducted we can conclude that ROE ROCE and ROA of a company plays an important role in determining the ESG score of a company while net profit is not a variable that has a significance or importance in deriving the ESG score in the IT Sector.

# CHAPTER 3: SUMMARY, FINDINGS & CONCLUSION

## *3.1 Summary*

The study examined the financial performance of Indian companies that prioritize sustainability by using the ESG score as the dependent variable and ROE, ROA, ROCE, and net profit as the independent variables. The study focused on the IT and financial services sectors.

The study employed several models, including the least square model, two-stage least square model, GMM model, model diagnosis test, and Ramsey test. These models were used to estimate the relationships between the independent and dependent variables, correct for potential endogeneity issues, evaluate the adequacy of the models, and test for omitted variable bias.

The results showed that there was a positive and significant relationship between the ESG score and the financial performance indicators (ROE, ROA, ROCE) for both sectors. Whereas, financial performance indicator Net profit did not affect much. The findings suggest that companies that prioritize sustainability tend to have better financial performance than those that do not.

Moreover, the study found that the two-stage least square model and GMM model were more appropriate for addressing endogeneity issues than the least square model. Additionally, the model diagnosis test showed that the models were well-specified, and the Ramsey RESET test did not find evidence of omitted variable bias.
The findings of this research support the argument that companies that prioritize sustainability can perform better financially. Companies with high ESG scores were found to have higher ROE. The analysis also demonstrated that sustainability can mitigate risks for companies, leading to better financial performance. The research shows that companies that prioritize sustainability in their operations can generate higher financial returns and reduce risks, making a business case for sustainable practices.

Overall, the study provides evidence that Indian companies that prioritize sustainability have better financial performance, and the findings suggest that incorporating sustainability indicators into financial analysis can improve decision-making.

## *3.2 Findings*

The findings of the study revealed that the ESG score had a positive and significant impact on financial performance indicators such as ROE, ROA, ROCE, and Net Profit, indicating that companies that prioritize sustainability perform better financially. Additionally, the study found that the relationship between sustainability indicators and financial performance was more significant in the IT sector than the Financial Services sector.

The study also found that the two-stage least square model and the GMM model produced more reliable and consistent results compared to the least square model. The model diagnosis test revealed that the models used in the study were reliable and adequately specified, while the Ramsey RESET test indicated no evidence of misspecification or omitted variables in the models.

Overall, the study provides empirical evidence of the positive relationship between sustainability and financial performance in Indian companies, particularly in the IT sector. The study's findings suggest that incorporating sustainability indicators into financial decision-making can lead to better financial performance and that using advanced econometric models can provide more reliable and consistent results.

## *3.3 Conclusion*

The study examines the relationship between financial performance and sustainability of Indian companies in the IT and Financial Services sectors. The ESG score is used as the dependent variable, while the independent variables are ROE, ROA, ROCE, and net profit.

The study uses several regression models such as the least square model, two-stage least square model, GMM model, and conducts model diagnosis tests and Ramsey RESET tests to analyze the data. The results of the study provide valuable insights into the relationship between financial performance and sustainability, particularly in the IT and Financial Services sectors in India.

Overall, the study suggests that there is a positive correlation between financial performance and sustainability, as indicated by the significant coefficients of the independent variables in the regression models. The results also show that the two-stage least square and GMM models produce more reliable and accurate estimates than the least square model.

Additionally, the model diagnosis tests indicate that the regression models are well-specified and that there are no issues of heteroscedasticity, autocorrelation, or multicollinearity. The Ramsey RESET test also confirms the adequacy of the regression models.

The study findings support the idea that companies that prioritize sustainability can generate higher financial returns and reduce risks. This analysis of financial performance suggests that companies that prioritize sustainability gain competitive advantages in a world increasingly concerned with social and environmental issues.

In conclusion, the study highlights the importance of sustainability in financial performance and provides evidence to support the integration of ESG factors into investment decision-making. The findings can be useful for investors, policymakers, and stakeholders interested in sustainable investments in the Indian IT and Financial Services sectors.

The research demonstrates the importance of sustainability and its positive impact on the financial performance of companies.

## *3.4 Suggestions*

some suggestions for the study on the financial performance of Indian companies that prioritize sustainability are:

1. Data collection: Ensure that the data on ESG score and financial performance indicators such as ROE, ROA, ROCE, and net profit are reliable, accurate, and consistent across the sample companies. Consider using publicly available data sources or company reports to collect the data.

2. Sample selection: Clearly define the criteria for selecting companies that prioritize sustainability in India, such as their ESG scores or sustainability ratings. Ensure that the sample is representative of the IT and Financial services sectors in India and that the companies in the sample have sufficient data on the financial performance indicators. Also, inclusion of various sectors in the study.

3. Model selection: Consider using different regression models such as the least square model, two-stage least square model, GMM model, and model diagnosis tests to estimate the relationship between the ESG score and financial performance indicators. Compare the results of different models and choose the most appropriate one based on the goodness of fit, statistical significance, and other criteria.

4. Variable selection: Consider including additional independent variables such as leverage, market capitalization, and dividend pay-out ratio to account for other factors that may affect the financial

performance of companies in India. Ensure that the independent variables are not highly correlated to avoid multicollinearity.

5. Test assumptions: Conduct diagnostic tests such as the Ramsey RESET test to test the assumptions of the regression models, such as linearity, homoscedasticity, and normality of residuals. If there are violations of these assumptions, consider using alternative models or data transformations.

6. Interpretation of results: Interpret the coefficients of the independent variables in the regression models to understand the direction and strength of the relationship between the ESG score and financial performance indicators. Consider the significance of the coefficients, R-squared value, and other goodness-of-fit measures to evaluate the reliability and validity of the models.

Overall, the study on the financial performance of Indian companies that prioritize sustainability can provide valuable insights into the relationship between sustainability and financial performance in the IT and Financial services sectors in India. By using appropriate statistical models and tests, the study can help to inform decision-making by investors, policymakers, and other stakeholders in India.

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