İŞLETME ARAŞTIRMALARI DERGİSİ
JOURNAL OF BUSINESS RESEARCH-TURK
2025, 17(1), 739-750
https://doi.org/10.20491/isarder.2025.2000

ESG Performance of Istanbul Stock Exchange Companies: An Impact Analysis on Firm Value and Profitability

Yasemin YURTOĞLU [a] **Emre GÜLŞEN** [b]
[a]Ufuk University, Faculty of Economics and Administrative Sciences, Ankara, Türkiye. yasemin.yurtoglu@ufuk.edu.tr
[a]Turkish Court of Accounts, Ankara, Türkiye. emregulsen@yahoo.com

ARTICLE INFO

Keywords:
Sustainability Index
Borsa Istanbul (BIST)
Firm Value

Received 17 November 2024
Revised 14 March 2025
Accepted 20 March 2025

Article Classification:
Research Article

ABSTRACT

Purpose - This study aims to analyze the relationship between environmental, social and governance (ESG) performance and financial performance of firms listed on Borsa Istanbul. The study compares firms in the BIST Sustainability Index with other firms in the BIST 100 Index.

Design/methodology/approach - A balanced panel data set of 68 firms covering the period 2016-2022 is used. Tobin's Q and ROA are preferred for financial performance and independent variables include sustainability index (dummy), financial leverage, asset size, asset turnover, current ratio and market capitalization. Modelling was performed with panel data analysis.

Findings - In the Tobin's Q model, inclusion in the BIST Sustainability Index has a negative impact on market valuation, but in the ROA model, they increase operational efficiency and profitability. With this, it is suggested that ESG practices are not totally suitably assessed by the market; however, they might develop operational performance.

Discussion – It is submitted by the findings that market participants might underestimate the long-term advantages of sustainability practices. However, these practices develop operational efficiency and profitability and thus offer firms a competitive advantage. The need for further research and awareness on the financial effects of sustainability practices are highlighted by the study.

1. INTRODUCTION

In this study, the effect of Environmental, Social and Governance (ESG) practices on financial performance (FP) in Borsa Istanbul is examined. Global demographic expansion and increased risks of climate change have resulted in different environmental and social issues. In order to address sustainability problems, firms are encountering growing pressure to develop strategies and initiatives. Primarily, companies concentrate on sustainability practices such as waste management, carbon reduction and improving operational capacities so as to secure the interests of stakeholders and to increase firm value (Naeem et al., 2022). According to stakeholder theory, addressing the interests of stakeholders, which is expected to sustain motivation for companies to accomplish their duties by developing and achieving ESG performance metrics, is the primary purpose of the companies (DasGupta, 2022).

A significant improvement in understanding, knowledge and policies in regard with sustainability practices in Türkiye is represented by the construction of the BIST Sustainability Index to encourage a sustainable business environment among companies traded on Borsa Istanbul. This index incorporates the stocks of companies which have become successful with regard to corporate sustainability and has an important place in the improvement of ethical business practices in the Turkish financial market (Gündüz, 2018). It is expected that The BIST Sustainability Index will develop into a dynamic factor having an impact on financial results and motivating the public to help businesses which follow more ethical and sustainable business policies. It establishes a strong connection between ESG practices and financial results and thus it encourages a culture which gives importance to sustainability activities. The index focuses on sustainability, which in turn makes it encourage the integration of ethical business practices into traditional corporate strategy (Borsa Istanbul, 2024). The BIST Sustainability Index plays a role in the wider discourse on corporate responsibility by supplying incentives for companies to conform to firm inclusion requirements. By connecting sustainability commitments to financial incentives, investors are encouraged to reflect not only on financial returns but also

Suggested Citation
Yurtoğlu, Y., Gülşen, E. (2025). ESG Performance of Istanbul Stock Exchange Companies: An Impact Analysis on Firm Value and Profitability, İşletme Araştırmaları Dergisi, 17 (1), 739-750.

the wider economic and social effects of their investments. This results in a much more thorough approach to capital allocation and resource allocation (Durand et al., 2019).

ESG is an evaluation system allowing companies not only to maximize their profits but also to accomplish multiple goals such as environmental protection and social responsibility (Liu et al., 2022). On the other hand, academic studies on whether ESG activities contribute to the anticipated financial benefits for investors and businesses show contradictory results (Bradford & Damodaran, 2020). It is suggested by the criticisms of ESG activities that inflated prospects of financial gains which are based on ambiguous research exaggerate the value of these activities and that the real benefits are lower than the costs. Accordingly, some businesses gain from social responsibility whereas others endure losses which are not compensated by gains (Zhang et al., 2024).

The purpose of this study is to analyze the impacts of inclusion in the BIST Sustainability Index on financial performance of firms. Panel data analysis, an extensive and dynamic method, is used to evaluate the performance of companies over time. By comparing them with the companies in the BIST 100 index, the financial impacts of the companies which are included in the BIST Sustainability Index are assessed within this framework. By using this comparative approach, our purpose is to sustain in-depth data regarding the degree to which the BIST Sustainability Index reinforces sustainable business practices in the Turkish real sector.

2. LITERATURE REVIEW

The aim of The Sustainability Index is to offer a benefit to companies that can control corporate risks and take advantage of sustainability opportunities. In the literature, we have reached varied results to study the nature of the relationship between sustainability (ESG) practices and financial performance. The relationship between ESG practices and financial performance can be divided into four categories, which are positive, negative, complex and contextualized effects.

Alareeni and Hamdan (2020), Aydoğmuş et al. (2022), Velte (2017), Wong et al. (2021), Ahmad et al. (2021) looked into the effect of Environmental, Social, Governance (ESG) performance on firm value and profitability of firms in different countries. It is revealed by these studies that ESG disclosures and performance has a significant impact on financial measures such as return on assets (ROA), return on equity (ROE) and Tobin's Q. In particular, studies by Alareeni and Hamdan (2020), Aydoğmuş et al. (2022), Velte (2017) analyze three different components of ESG separately and reveal that governance performance has affected firm value and profitability significantly in comparison with environmental and social performance.

Stekelenburg et al. (2015), Su and Chen (2020), Güler and Küçükbay (2022) examine the effects of involvement with the sustainability index on the performance of companies. Based on this, investors have a positive attitude towards firms which prove their commitment to sustainability and thus a financial incentive is provided for companies to apply ESG strategies. It is also suggested that the inclusion (or exclusion) of companies in sustainability benchmarks results in remarkable but short-term increases (decreases) in abnormal stock returns. As an indicator of firms' investments in social responsibility, the short- and long-term effects of the Dow-Jones Sustainability Index (DJSI) on the monetary performance of firms in the service industry is examined by Su and Chen (2020). According to the findings of the study, the financial performance of firms in the service industry is more vulnerable to changes in the DJSI component list (inclusion or exclusion). It is shown by Güler and Küçükbay (2022) that inclusion in the sustainability index has a statistically significant impact on the profit potential in emerging markets such as Brazil and Türkiye. It is indicated by these studies that the market reacts well to firms' ESG practices and also highlights that inclusion in sustainability benchmarks has a significant place in terms of communicating company quality and sustainability commitment to investors.

Kempf and Osthoff (2007), Maiti (2021), Chen et al. (2023) assessed the direct financial returns which are supplied by ESG-conscious investment strategies. Kempf and Osthoff (2007) show that investors generate annual abnormal returns when they include stocks with social responsibility ratings in their portfolios, especially when using best-in-class screening strategies. Maiti (2021) argues that ESG practices should be included in asset pricing models and that portfolios constructed according to these practices outperform traditional investment approaches. Chen et al. (2023) provide evidence that stocks with high ESG scores

outperform stocks with low scores in China and that this is a persistent premium even when common pricing factors are taken into account. They show that ESG investments are financially viable and that ESG practices play a critical role not only as indicators of firm quality but also in delivering superior investment performance.

Financial effects of ESG in a regional and sectoral framework is examined by Shirasu and Kawakita (2021) and Ni and Sun (2023). It is suggested by Shirasu and Kawakita (2021) that corporate social responsibility (CSR) activities are strongly correlated with long-term stock returns in Japan and that long lasting investment-driven shareholders with strong governance structures stimulate ESG activities. However, variable impacts of corporate ESG performance on stock returns in Chinese stock markets are investigated by Ni and Sun (2023). In their study, it is revealed that the effect of ESG performance on stock returns grows dramatically, especially after primary policy announcements. These findings indicate that regional market dynamics and industry characteristics are essential in assessing the financial effect of ESG practices.

In brief, all these papers show a generally positive relationship between ESG practices and firm's financial performance. Some factors such as geographical location, industry dynamics and specific ESG criteria may have an effect on the course of this relationship. The findings highlight that ESG considerations need to be strategically integrated into corporate and investment decision-making processes and suggest that ESG is essential in sustained financial success.

In order to analyzing the impacts of ESG practices on firms' financial performance and attractiveness to investor, it is necessary to make an in-depth examination considering different geographical and market conditions. Valuable insights into the impacts of these practices on corporate outcomes are acquired by research from some countries with varied levels of economic development, such as the United States, Europe, Türkiye and Brazil. Nazarova and Lavrova (2022) analyzed S&P 500 American and S&P 350 European companies with the aid of such indicators as Tobin's Q, return on equity (ROE), cost of capital and dividend payout probability, and examined the effect of ESG performance on investor interest. According to findings of the research, high ESG performance has a positive effect on market valuations and investor attractiveness whereas firm managers take precautions to guarantee that ESG performance is not below standard.

The effect of ESG practices on corporate financial performance (CFP) indicators of listed companies in Türkiye was analyzed by Saygili et al. (2022). In this study, it is indicated that ESG practices have a negative impact on financial performance in general, while stakeholder engagement on the social dimension increases operational efficiency. Regarding governance, shareholder rights and board regulations positively affect financial performance. This emphasizes the sophisticated dinamics among different dimensions of ESG and their diverse impacts on corporate outcomes in emerging markets.

By presenting a global outlook on emerging markets and financial institutions in Brazil, Criso´stomo et al. (2011) and Buallay (2019) work on sustainability reporting. Criso´stomo et al. (2011) disapprove sustainability practices in Brazil and reveals that there is a negative relationship between these initiatives and firm value and also a neutral relationship with financial performance. Buallay (2019) examines the impacts of sustainability reporting on corporate performance and indicates that whereas ESG can improve market performance, it can also have a negative effect on financial and operational performance, which shows the double-directional characterictic of sustainability efforts, where the search of wider societal objectives may cross paths with and sometimes challenge traditional measures of business performance.

The impacts of ESG measures on investor sentiment and market performance in different countries with different economies such as India and China are investigated by Dhasmana et al. (2023) and Zheng et al. (2023). In their study on Indian firms, Dhasmana et al. (2023) found that there is an asymmetric relationship between the ESG index and investor sentiment. According to the findings of this study, a raise in the ESG index impairs investor sentiment, whereas low ESG performance enables investor sentiment to increase. However, investor sentiment has no significant effect on the ESG index and investors are generally indifferent to corporate ESG initiatives. These results suggest that ESG investments in India are not fully integrated with investor sentiment and that policy and institutional strategies based on ESG criteria need to be restructured. Zheng et al. (2023) analyze the impact of corporate ESG on financial returns and market dynamics based on a large sample of Chinese firms' local mergers and acquisitions. The study finds that firms with higher ESG ratings perform better post-merger, deals are more likely to be completed, and the relationship between ESG dynamics and

post-merger performance depends on the firm's prior ESG practices. Moreover, by examining the dynamic ESG premium in Chinese equity markets, the study suggests that firms with low ESG scores paradoxically achieve higher stock returns after large environmental commitments. This research quantifies an ESG risk premium by showing that ESG-related risks are recognized and compensated in the market, especially among state-owned enterprises with strong ESG metrics. These findings indicate the diversified impacts of ESG metrics on investor sentiment and market performance in various emerging markets and empasize the sophisticated and regionalized characteristic of ESG investment.

Yilmaz et al. (2020) and Anita et al. (2023) analyzed the impacts of media coverage and inclusion in the sustainability index on firm value in the framework of corporate sustainability and ESG debates. Yilmaz et al. (2020) prioritized the Turkish market through working on the relationship between inclusion in the Borsa Istanbul Sustainability Index and corporate performance measures. It is revealed by the findings that whereas no strong evidence on the impact of inclusion or exclusion from the BIST Sustainability Index on companies' stock returns and systematic risks is found, inclusion in the index diminishes companies' total risk and increases their resilience during a severe crisis. This study emphasizes the important advantages of inclusion in a sustainability index to firm value through developing firms' risk profiles and increasing institutional ownership. On the other hand, Anita et al. (2023) examine in what way media coverage of ESG issues and the type and intensity of media access has an effect on corporate value in the emerging market of India. They reveal that ESG issues reduce corporate value when media reach is high and enhance corporate value when seriousness is high. This complex view of media influence emphasizes the challenging situation of managing ESG issues and the uncertain nature of their effect on firm value.

Junius et al. (2020) showed the strengths and weaknesses of ESG activities and also stated that strengths enhance firm value whereas weaknesses diminish it. They revealed that this impact is balanced by the level of disclosure and that disclosure diminishes the negative effects, but it reduces the positive effects to a certain extent. Atan et al. (2018) extended this. In the framework of Malaysian companies, they found that there is no direct relationship between ESG factors and firm profitability or value, but a positive effect on the cost of capital. Giannopoulos et al. (2022) offer a mixed perspective from Norway and show that ESG initiatives negatively affect Return on Assets (ROA), whereas there is a positive correlation between ESG initiatives and Tobin's Q, variable results depending on financial metrics. In an analysis of the Korean market, Yoon et al. (2018) verified the positive effect of ESG on market capitalization and revealed that there are varied effects which are based on specific details and corporate governance practices for firms in green sensitive sectors.

Long et al. (2020) and D'Amato and Falivena (2020) made a more detailed examination on how the ESG-financial performance link is shaped by external factors and firm characteristics. In the Long et al. (2020) study analyzed within the framework of China's unique institutional structure, it is indicated that there is a possitive effect on financial performance, but this relationship has limitations due to state ownership and industry competition. This findings show that the external environment is significant in determining the effectiveness of ESG activities. D'Amato and Falivena (2020), in a European context, examined the limitations of the impact on firm value due to firm size and age and revealed that smaller and younger firms may not have a significant advantage owing to resource constraints and lack of experience or reputation.

Finally, Okafor et al. (2021) examine US technology firms and show the positive impacts of ESG expenditures on revenue and profitability and reach results which are different from previous findings on the relationship between Tobin's Q. They argue that the effects on financial outcomes can change to an important extent across sectors and regions and demonstrate the importance of stakeholder expectations. They argue that the effects on financial results may change significantly across sectors and regions and indicate how important stakeholder expectations are.

These studies show that the impact of ESG on firm value and financial performance is also determined by firm characteristics and the wider institutional and competitive environment. It is suggested by this complex interaction that the advantages of ESG are multidimensional and that a more detailed approach is necessary to understand in what way it affects the effectiveness of these factors in various circumstances. These findings offer us a more elaborate understanding of the strategic value of ESG and may also provide valuable

implications for businesses, policymakers and researchers who seek to manage the evolving field of sustainability practices.

3. METHODOLOGY

We included 68 firms in the BIST 100 index with complete data from the 4th quarter of 2016, until the end of the 4rd quarter of 2022 to form a balanced panel in the study. For this reason, we excluded 32 firms that were in the BIST 100 by the end of the 4rd quarter in 2022 but went public after the year 2016 from the scope. The reason for doing such a thing is to create a "balanced" panel. As is known, when there is missing data in panel data analysis, the reliability of the model decreases and becomes unbalanced. The list of firms included in the study is provided in Appendix 1. The data within the scope of the study was collected using the Bloomberg terminal.

From this perspective, there are 1768 observations in the model. Of these, 1040 (59%) of the observations from firms included in the ESG index, while 728 (41%) are outside the ESG index. It is considered that the available data exhibits a good distribution in terms of comparability.

Table 1 below shows the descriptive statistics of the data belonging to the model. Regarding 1768 observations belonging to all firms, the average value for Tobin Q is 1,43, return on assets is %8,01, sustainability index dummy variable 0,48, financial leverage is 4,93, total assets amount to 33,594 million TRY, revenue / total assets ratio is 0,28, the natural logarithm of market capitalization is 8,46 and the current ratio is 5,36.

Firms in the sustainability index have a slightly lower mean Tobin's Q Ratio (1.322 vs. 1.579) and Return on Assets (7.12% vs. 9.29%), indicating a lower market valuation relative to assets and less efficiency in generating profit. They also exhibit higher financial leverage (6.36 vs. 2.87) and larger total assets (53,484.72 million vs. 5,179.11 million), suggesting greater reliance on debt and larger scale. Additionally, sustainability index firms generate more revenue per unit of asset (0.331 vs. 0.206) and have a slightly higher market capitalization (LN Market Cap of 8.63 vs. 8.21). However, their liquidity, as measured by the current ratio, is lower (1.30 vs. 11.14), indicating less short-term liquidity compared to non-index companies.

Table 1. Descriptive Statistics of the Firms

	Tobin's Q	Return on Assets	Sustainability index (dummy)	Financial Leverage	Total Assets (Million TRY)	Revenue / Total Assets	Market Cap (log)	Current Ratio
All firms (N= 1768)								
Mean	1,43	8,01	0,48	4,93	33.594,18	0,28	8,46	5,36
Median	1,18	6,24	0	2,83	7.630,57	0,18	8,46	1,27
Std Dev	0,88	10,80	0,50	20,80	112.823,08	0,62	1,45	37,25
Max	11,45	73,88	1	599,78	1.582.594,00	17,87	12,27	987,04
Min	0,32	- 30,37	0	-16,63	204,73	-	4,07	0,07
Firms in the sustainability index (N=1040)								
Mean	1,32	7,12	0,82	6,36	53.484,72	0,33	8,63	1,30
Median	1,16	5,91	1	3,46	15.684,04	0,20	8,77	1,16
Std Dev	0,53	8,16	0,39	26,30	143.724,08	0,78	1,45	0,61
Max	4,44	69,43	1	599,78	1.582.594,00	17,87	12,20	5,32
Min	0,49	- 14,11	0	1,24	1.603,31	0	4,07	0,34
Firms not included in the sustainability index (N=728)								
Mean	1,58	9,29	0	2,87	5.179,11	0,21	8,21	11,14
Median	1,22	6,75	0	2,15	3.206,05	0,15	8,09	1,87
Std Dev	1,19	13,62	0	7,51	6.503,79	0,22	1,40	57,56
Max	11,45	73,88	0	172,37	52.462,15	1,85	12,27	987,04
Min	0,32	-30,37	0	-16,63	204,73	0	5,38	0,07

4. ANALYSIS AND FINDINGS

Panel data analysis method is used to determine the relationship between Tobin's Q and ROA, which are the dependent variables representing firm value, and independent variables. Financial leverage, asset size, asset turnover, current ratio and market capitalization, which are considered to be the main explanatory variables on firm value, are taken from the balanced panel data set created for 68 firms between 2016-2022.

Table 2. Details of the Variables

Abbreviation	Name	Definition	Formulation
Tobin Q	Tobin Q	Dependent variable	[Total assets - Equity + (Number of shares x Share price)] ÷ Total assets
ROA	Return on Assets	Dependent variable	Net income / Total Asssets
esgdummy	Sustainability Index (Dummy)	Control variable	Included in the index: 1 not:0
lnfinlev	Financial Leverage (Logaritmic)	Independent variable	Ln (Total Liabilities / Total Assets)
lnassets	Asset Size (Logaritmic)	Independent variable	Ln (Total Asset Value)
lnrevasset	Asset Turnover Ratio (Logaritmic)	Independent variable	Ln (Total Sales / Average Assets)
lnmarcap	Market Capitalization (Logaritmic)	Independent variable	Ln (Value realized on the stock Exchange)
lncurrent	Current ratio (Logaritmic)	Independent variable	Ln (Current assets / Short-term liabilities)

The N value expressing the horizontal cross-sectional dimension of the panel data is 68 and the T value expressing the time dimension is 26. The total number of observations (NxT) is 1768. In order to determine the direction and severity of this relationship, the following 2 models were created.

Model 1: $TobinQ_{it} = \alpha + \beta 1\ \text{esgdummy}_{it} + \beta 2\ \text{lnfinlev}_{it} + \beta 3\ \text{lnassets}_{it} + \beta 4\ \text{lnrevasset}_{it} + \beta 5\ \text{lnmarcap}_{it} + \beta 6\ \text{lncurrent}_{it} + u_{it}$

Model 2: $\text{ROA}_{it} = \alpha + \beta 1\ \text{esgdummy}_{it} + \beta 2\ \text{lnfinlev}_{it} + \beta 3\ \text{lnassets}_{it} + \beta 4\ \text{lnrevasset}_{it} + \beta 5\ \text{lnmarcap}_{it} + \beta 6\ \text{lncurrent}_{it} + u_{it}$

Pooled OLS is used to estimate the regression models. In the literature, pooled OLS is also frequently used in firm-based studies. More specifically, the Driscoll-Kraay standard errors method is used to estimate the empirical model. The results obtained from Driscoll and Kraay's (1998) standard errors approach are robust to the problems of changing variance and general cross-sectional and temporal dependence (Driscoll & Kraay, 1998).

Table 3. First Model Estimation Results

Dependent Variable: Tobin Q				
Independent Variables	Coefficient	Std. Deviation	t Statistics	Probability
esgdummy	-0.13592***	0.045083	-3.01	0.0060
lnfinlev	0.054417***	0.012985	4.19	0.0000
lnass	-0.12958***	0.013506	-9.59	0.0000
lnrevasset	0.226366***	0.018494	12.24	0.0000
lnmarcap	0.152763***	0.016255	9.40	0.0000
lcurrent	0.146852***	0.026838	5.47	0.0000
Sabit Terim	1.65538***	0.133409	12.41	0.0000
F Statistics 16.86***				
Probablity (F) 0.0000				

Notes: i. *, **, *** denote 10%, 5% and 0.01% significance levels, respectively. ii. All variables are logarithmic except the dependent variable. iii. In the baseline regression model, Driscoll-Kraay robust standard errors are generated due to the presence of different variance, autocorrelation and cross-sectional dependence problems.

The estimation results presented in Table 3 demonstrate several important findings regarding the relationship between the independent variables and Tobin's Q, which serves as the dependent variable in this model. The statistical significance and effects of the variables are as follows:

The F-statistic (16.86) and the corresponding p-value (0.0000) suggest that the model as a whole is highly statistically significant, indicating that the independent variables, taken together, provide a meaningful explanation of the variation in Tobin's Q. This implies that the chosen predictors are appropriate for understanding the dynamics of Tobin's Q.

All independent variables included in the model are statistically significant at the 1% level ($p < 0.01$), as indicated by their p-values. The above high level of significance across all the variables indicates that all the variables have an important influence on Tobin's Q, and hence, caution should be exercised in the interpretation of the coefficients of the variables.

ESGDUMMY which is a variable that checks the presence of an ESG factor has an extract (-0.13592) and is again statistically considerable. This also gives an implication that firms with ESG factors performed poorly in terms of Tobin's Q; therefore, there exists a trade-off between ESG factors and firms valuation as measured by Tobin's Q. The cost savings may be offset by factors that would somehow decrease the organization's credit scores, adjusting for more exhaustive research on these causes.

The empirical results point that a 1% increase in financial leverage (lnfinlev), asset turnover (lnrevasset), market capitalization (lnmarcap), and current ratio (lncurrent) enhances Tobin's Q by 0.05, 0.23, 0.15, and 0.15 units respectively. These positive coefficients imply that firms' that have more financial leverage, greater revenue efficiency, and larger market value, and better liquidity have a higher Tobin's Q which implies firm valuation.

On the other hand, increase in total assets by 1% reduces Tobin's Q by 0.13 unit. This inverse relationship could tend to suggest that as the firms increase in size in terms of assets, their Tobin's Q decreases, it may therefore, be inferred that the returns on asset growth may decrease as assets increase. Any slight changes in the overall values could be attributed to perceptions of large bases of assets not translating into equally boosted market values.

Table 4. Second Model Estimation Results

Dependent Variable: ROA				
Independent Variables	Coefficient	Std. Deviation	t Statistics	Probability
esgdummy	2.094218***	0.525019	3.99	0.0010
lnfinlev	-3.30672***	0.363305	-9.1	0.0000
lnass	-0.84203**	0.356495	- 2.36	0.0260
lnrevasset	0.413714	0.29233	1.42	0.1690
lnmarcap	0.517404***	0.158954	3.26	0.0030
lcurrent	2.462843***	0.316738	7.78	0.0000
Sabit Terim	13.85286***	4.531719	3.06	0.0050
F Statistics 79.04***				
Probablity (F) 0.0000				

Notes: i. *, **, *** denote 10%, 5% and 0.01% significance levels, respectively. ii. All variables are logarithmic except the dependent variable. iii. In the baseline regression model, Driscoll-Kraay robust standard errors are generated due to the presence of different variance, autocorrelation and cross-sectional dependence problems.

As seen in Table 4, the F-statistic of 79.04 supports the significance of the overall model supplemented by the insignificant p-value of 0.0000. This corroborates our recognition that the independent variables taken cumulatively have a significant and stable influence on the fluctuation in ROA hence the applicability of the model in understanding the drivers that affect the return on the total asset.

The majority of the independent variables has conventional p-values of less than 1% or 5% which therefore indicate the level of significance. These significant variables offer reasonable levers for attributing the fluctuations in ROA and emphasise their roles in the model.

The ESGDUMMY showing the environmental, social, and governance factors exhibit a positive correlation with ROA, and the result is statistically significant. The coefficient of 2.094 implies that firms with an ESG focus enjoy a 2.09 unit higher ROA suggesting that ESG may be associated with better operating performance or financial return. This result reflects the possibility of operating profitable business that are socially and environmentally sensitive; however, more research is needed to provide additional evidence of such outcomes across industries.

An increase in the financial leverage (lnfinlev) by 1% decreases ROA by 3.31 and an increase in total assets (lnass), also by 1% reduces ROA by 0.84. The results of this study imply that greater use of financial leverage and total assets could harm a firm's returns on equity, potentially as a result of the elevated cost of debt or diseconomies of scale connected with larger firms. While the sign of the coefficient is positive for the asset turnover (lnrevasset), it is not significant at ($p = 0.1690$).

Every one percent increase in the market capitalization (lnmarcap) increases the ROA by 0.52 units, while every one percent increase in the current ratio (lncurrent) increases the ROA by 2.46 units. Both coefficients are significant at 1 percent level; thus it gives an indication that, firms with higher market capitalization and high levels of liquidity post lower returns on their assets.

The second model which highlights the impact of the sized-up ESG rating on the ROA suggests that the ESG rating improves ROA, but total assets and financial leverage reduce it. On the market factors, both market capitalization and liquidity significantly affect the increase in profitability, while the asset turnover is positive but not statistically significant to ROA. From these evidences, valuable information can be obtained about the antecedents of the probability of firms generating profits, particularly regarding ESG practices, financing sources, and firm scale.

5. CONCLUSION

This study aims to analyze the relationship between environmental, social and governance (ESG) performance, financial performance and market capitalization of firms listed on Borsa Istanbul. Firms in the BIST Sustainability Index and BIST 100 Index are compared with a balanced panel data set including 68 firms for the period 2016-2022. Tobin's Q and ROA models are used to assess firm value and financial performance. In this process, key factors that are thought to affect firm value and financial performance such as financial leverage, asset size, asset turnover, current ratio and market capitalization are considered and analyzed.

The two panel data analyses, one based on Tobin's Q while the other based on Return on Assets, indicate significant differences and can offer insightful information for more research in the field. In the Tobin's Q regression analysis (Model 1), all the independent variables were significant indicating the independent variables have a higher association with the measure of market valuation. More specifically, ESGDUMMY was found to have a negative effect on Tobin's Q; these results suggest that firms with higher ESG scores could be less well regarded by the market in terms of the asset replacement cost model. This is consistent with previous studies regarding the potential negative attitudes of investors towards ESG policies based on their assessment of short-term expenses versus long-term gains (Saygili et al., 2022; Criso´stomo et al., 2011). However, the ROA model (Model 2) revealed that ESGDUMMY boosted the operational efficiency and profitability to a positive level. This positive change in ROA affirms the argument that sustainable efforts help to raise firm performance through the optimization of operations and the minimization of threats (Velte, 2017).

These differences can be explained with reference to the very characteristics of the dependent variables. Tobin's Q which is the relative valuation of the market price to the replacement cost of the assets stresses on the investors' actions and prospects. In contrast, ROA reflects operational efficiency and profitability in terms of total assets without taking into consideration external factors, using internal evaluation indicators.

Investors' beliefs and actual investment decisions may not always coincide. Although investors state that they shape their preferences in line with sustainability principles, their portfolio allocations may not fully reflect these claims (Heeb et al.,2023). Similarly, it might be observed that individuals with high attitudes towards sustainability do not always act in line with these attitudes in their purchasing decisions. In the literature, this is defined as the "attitude-behavior gap" (Garamvölgyi, 2021). Another problem for the investors who want to engage in sustainable investments and create social impact, is "greenwashing" activities of the companies',

which makes it difficult to channel capital into truly environmentally friendly investments (Kräussl et al., 2024).

ESG factors serve shareholder interests in long-term planning and that ESG investments start to create value after reaching a certain threshold, rather than providing an immediate return, (Alareeni & Hamdan, 2020). Because of this nature of the ESG investment's listed companies should focus on attracting institutional investors in line with their long-term growth objectives. Institutional investors have a stronger governance influence on the company and can also contribute to a healthier perception of the company's future potential in capital markets (Wu et al., 2022). ESG activities should be publicized more effectively and made more visible to society. Considering ESG as a reciprocally advantageous process between the firm and society can help enhance the firm's corporate reputation in the medium and long term (Crisóstomo et al., 2011).

Government can be considered as an important stakeholder to encourage ESG investments. It is stated in Junius et al. (2020)'s study that they offer a framework for governments in order to set guidelines which can classify companies in accordance with their ESG performance. It is highlighted that such classifications can encourage the public to make wiser investment decisions. It is also stated that investors should demand from companies to report and integrate ESG performance indicators as an integral part of their corporate performance. Additionally, corporate ESG disclosure requirements should be applied through legislation and relevant policies should be created to encourage companies to share ESG information more transparently and comprehensively by governments.

It is possible that the effects of COVID-19 pandemic significantly affect the market capitalization of the companies. The variations which are noticed in the results of investor actions and firm outcomes on the dependent variables during this time can be explained by these fluctuations.

REFERENCES

Ahmad, N., Mobarek, A., & Roni, N. N. (2021). Revisiting the impact of ESG on financial performance of FTSE350 UK firms: Static and dynamic panel data analysis. *Cogent Business & Management, 8*(1), 1-18. https://doi.org/10.1080/23311975.2021.1900500.

Alareeni, B. A., & Hamdan, A. (2020). ESG Impact on performance of US S&P 500-listed firms. *Corporate Governance: The International Journal of Business in Society, 20*(7), 1409–1428. https://doi.org/10.1108/CG-06-2020-0258.

Anita, M., Shveta, S., Surendra, S. Y., & Arvind, M. (2023). When do ESG controversies reduce firm value in India? *Global Finance Journal, 55*, 100809. https://doi.org/10.1016/j.gfj.2023.100809.

Atan, R., Alam, M. M., Said, J., & Zamri, M. (2018). The Impacts of environmental, social, and governance factors on firm performance: panel study of Malaysian companies. *Management of Environmental Quality: An International Journal, 29*(2), 182-194. https://doi.org/10.1108/MEQ-03-2017-0033.

Aydoğmuş, M., Gülay, G., & Ergun, K. (2022). Impact of ESG performance on firm value and profitability. *Borsa _Istanbul Review, 22*(2022), 119-127. https://doi.org/10.1016/j.bir.2022.11.006.

Borsa İstanbul. (2024, 08 16). Sürdürülebilirlik endeksleri : https://www.borsaistanbul.com/tr/sayfa/165/bist-surdurulebilirlik-endeksleri.

Bradford, C., & Damodaran, A. (2020). Valuing ESG: Doing good or sounding good? *Journal of Impact and ESG Investing, 1*, 76–93. http://dx.doi.org/10.2139/ssrn.3557432..

Buallay, A. (2019). Between cost and value: Investigating the effects of sustainability reporting on a firm's performance. *Journal of Applied Accounting Research, 20*(4), 481-496. https://doi.org/10.1108/JAAR-12-2017-0137.

Chen, S., Han, X., Zhang, Z., & Zhao, X. (2023). ESG Investment in China: Doing well by doing good. *Pacific-Basin Finance Journal, 77*(2023), Article 101907. https://doi.org/10.1016/j.pacfin.2022.101907..

Crisostomo, V. L., de Souza Freire, F. ´., & de Vasconcellos, F. C. (2011). Corporate social responsibility, firm value and financial performance in Brazil. *Social Responsibility Journal, 7*(2), 295-309. https://doi.org/10.1108/17471111111141549.

D'Amato, A., & Falivena, C. (2020). Corporate social responsibility and firm value: Do firm size and age matter? Empirical evidence from european listed companies. *Corporate Social Responsibility and Environmental Management, 27*(2), 909–924. **https://doi.org/10.1002/csr.1855**.

DasGupta, R. (2022). Financial performance shortfall, ESG controversies, and ESG performance: evidence from firms around the world. *Finance Research Letters*, *46*, 102487. https://doi.org/10.1016/j.frl.2021.102487.

Dhasmana, S., Ghosh, S., & Kanjilal, K. (2023). Does investor sentiment influence ESG stock performance? Evidence from India. *Journal of Behavioral and Experimental Finance, 37*(2023). https://doi.org/10.1016/j.jbef.2023.100789.

Driscoll, J. C., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *The Review of Economics and Statistics , 80*(4), 549–560. https://doi.org/10.1162/003465398557825.

Durand, R., Paugam, L., & Stolowy, H. (2019). Do investors actually value sustainability indices? Replication, development, and new evidence on CSR visibility. *Strategic Management Journal, 2019*(40), 1471-1490. https://doi.org/10.1002/smj.3035.

Garamvölgyi, R. (2021). Attitude survey in the ESG investment fund market. *Prosperitas,* 8(1), 153-171. https://doi.org/10.31570/Prosp_2021_1

Güler, B., & Küçükbay, F. (2022). Does inclusion in the sustainability index contribute to the financial performance of the companies: Evidence from developing countries. *Journal of Economy Culture and Society, 66*(307-319). . https://doi.org/10.26650/JECS2021-927156.

Gündüz, Ç. (2018). Sürdürülebilirlik endeksi kapsamına alınmanın hisse senedi değerine etkisi: BIST uygulaması. *Bankacılar Dergisi*(106), 37-58.

Giannopoulos, G., Fagernes, R. V., Elmarzouky, M., & Hossain, K. A. (2022). The ESG disclosure and the financial performance of Norwegian listed firms. *Journal of Risk and Financial Management, 15*, 237. https://doi.org/10.3390/jrfm15060237.

Heeb, F., Kölbel, J. F., & Paetzold, F. (2023). Do investors care about impact? The Review of Financial Studies, 36(5), 1737-1787. https://doi.org/10.1093/rfs/hhac066

Junius, D., Adisurjo, A., Rijanto, Y. A., & Adelina, Y. E. (2020). The Impact of ESG performance to firm performance and market value. *Jurnal Aplikasi Akuntansi, 5*(1), 21-41. https://doi.org/10.29303/jaa.v5i1.84.

Kräussl, R., Oladiran, T., & Stefanova, D. (2024). A review on ESG investing: Investors' expectations, beliefs and perceptions. *Journal of Economic Surveys*, 38(2), 476-502. https://doi.org/10.1111/joes.12599

Kempf, A., & Osthoff, P. (2007). The Effect of socially responsible investing on portfolio performance. *European Financial Management,* 13(5), 908–922. https://doi.org/10.1111/j.1468-036X.2007.00402.x.

Liu, P., Zhu, B., Yang, M., & Chu, X. (2022). ESG and Financial performance: A qualitative comparative analysis in China's new energy companies. *Journal of Cleaner Production,* 379(2022), Article 134721. https://doi.org/10.1016/j.jclepro.2022.134721.

Long, W., Li, S., Wu, H., & Song, X. (2020). Corporate social responsibility and financial performance: The roles of government intervention and market competition. *Corporate Social Responsibility and Environmental Managemen,* 27(2), 525-541. https://doi.org/10.1002/csr.1817.

Maiti, M. (2021). Is ESG the succeeding risk factor? *Journal of Sustainable Finance & Investment, 11*(3), 199-213. https://doi.org/10.1080/20430795.2020.1723380.

Naeem, N., Cankaya, S., & Bildik, R. (2022). Does ESG performance affect the financial performance of environmentally sensitive industries? A comparison between emerging and developed markets. *Borsa Istanbul Review,* 22, 128-140. https://doi.org/10.1016/j.bir.2022.11.014.

Nazarova, V., & Lavrova, V. (2022). Do ESG factors influence investment attractiveness of the public companies?. *Journal of Corporate Finance Research,* 16(1), 38-64. https://doi.org/10.17323/j.jcfr.2073-0438.16.1.2022.38-64.

Ni, Y., & Sun, Y. (2023). Environmental, social, and governance premium in Chinese stock markets. *Global Finance Journal,* 55(2023), Article 100811. https://doi.org/10.1016/j.gfj.2023.100811.

Okafor, A., Adeleye, B. N., & Adusei, M. (2021). Corporate social responsibility and financial performance: Evidence from U.S tech firms. *Journal of Cleaner Production,* 292, 126078. https://doi.org/10.1016/j.jclepro.2021.126078.

Saygili, E., Arslan, S., & Birkan, A. O. (2022). ESG Practices and corporate financial performance: Evidence from Borsa Istanbul. *Borsa İstanbul Review,* 22(3), 525-533. https://doi.org/10.1016/j.bir.2021.07.001.

Shirasu, Y., & Kawakita, H. (2021). Long-term financial performance of corporate social responsibility. *Global Finance Journal,* 50, 100532.

Stekelenburg, A. V., Georgakopoulos, G., Sotiropoulou, V., Vasileiou, K. Z., & Vlachos, I. (2015). The Relation between sustainability performance and stock market returns: An empirical analysis of the Dow Jones Sustainability Index Europe. *International Journal of Economics and Finance,* 7(7), 74-88. https://doi.org/10.5539/ijef.v7n7p74.

Su, C.-H., & Chen, C.-D. (2020). Does sustainability index matter to the hospitality industry?. *Tourism Management,* 81, 104158. https://doi.org/10.1016/j.tourman.2020.104158.

Velte, P. (2017). Does ESG performance have an impact on financial performance? Evidence from Germany. *Journal of Global Responsibility,* 80(2), 169–178. https://doi.org/10.1108/JGR-11-2016-0029.

Wong, W. C., Batten, J. A., Ahmad, A. H., Mohamed-Arshad, S. B., Nordin, S., & Adzis, A. A. (2021). Does ESG certification add firm value?. *Finance Research Letters,* 39, 101593. https://doi.org/10.1016/j.frl.2020.101593.

Wu, S., Li, X., Du, X., & Li, Z. (2022). The impact of ESG performance on firm value: The moderating role of ownership structure. *Sustainability,* 14(21), 14507. https://doi.org/10.3390/su142114507.

Yilmaz, M. K., Aksoy, M., & Tatoglu, E. (2020). Does the stock market value inclusion in a sustainability index? Evidence from Borsa Istanbul. *Sustainability,* 12(2), 483. https://doi.org/10.3390/su12020483.

Yoon, B., Lee, J. H., & Byun, R. (2018). Does ESG performance enhance firm value? Evidence from Korea. *Sustainability,* 10(10), 3635. https://doi.org/10.3390/su10103635.

Zhang, S., Xu, G., Shu, Y., & Zhu, J. (2024). Corporate ESG competitive disadvantage and cost of debt financing. *Finance Research Letters,* 69, 106102. https://doi.org/10.1016/j.frl.2024.106102.

Zheng, Z., Li, J., Ren, X., & Guo, J. M. (2023). Does corporate ESG create value? New evidence from M&As in China. *Pacific-Basin Finance Journal,* 77(2023), 101916. https://doi.org/10.1016/j.pacfin.2022.101916.

Ek1. APPENDICES

Appendix 1. Companies Included in the Study

Sustainability Index Companies	Other BIST 100 Companies
AG Anadolu Grubu Holding A.Ş.	Afken GYO A.Ş.
Akçansa Çimento A.Ş.	Alarko Holding A.Ş.
Aksa Akrilik Kimya Sanayii A.Ş.	Anadolu Isuzu Otomotiv San. Tic. A.Ş.
Aksa Enerji Üretim A.Ş.	Bağfaş Bandırma Gübre Fabrikaları A.Ş.
Anadolu Efes Biracılık ve Malt Sanayii A.Ş.	Bera Holding AS
Arçelik A.Ş.	Borusan Mannesmann Boru San.Tic. A.Ş.
Aselsan Elektronik Sanayi ve Ticaret A.Ş.	Borusan Yatırım ve Pazarlama A.Ş.
Bim Birleşik Mağazalar A.Ş.	Bursa Çimento Fabrikası A.Ş.
Çimsa Çimento Sanayi ve Ticaret A.Ş.	Cemtaş Çelik Makina Sanayi ve Ticaret A.Ş.
Coca-Cola İçecek A.Ş.	Eczacıbaşı Yatırım Holding Ortaklığı A.Ş.
Doğan Şirketler Grubu Holding A.Ş.	Ege Endüstri ve Ticaret A.Ş.
Doğuş Otomotiv Servis ve Ticaret A.Ş.	Eczacıbaşı İlaç Sın. ve Fin. Yat. San. Tic. A.Ş.
Enka İnşaat ve Sanayi A.Ş.	Emlak Konut GYO A.Ş.
Ereğli Demir ve Çelik Fabrikaları T.A.S.	Gsd Holding A.Ş.
Ford Otomotiv Sanayi A.Ş.	Gübre Fabrikaları T.A.Ş.
Global Yatırım Holding A.Ş.	Hektaş Ticaret T.A.Ş.
Hacı Ömer Sabancı Holding A.Ş.	İpek Doğal Enerji A.Ş.
İş Gayrimenkul Yatırım Ortaklığı A.Ş.	İzmir Demir Çelik Sanayi A.Ş.
İş Yatırım Menkul Değerler A.Ş.	Konya Çimento Sanayii A.Ş.
Kardemir Karabük Demir Çelik San. ve Tic. A.Ş.	Koza Altın İşletmeleri A.Ş.
Karsan Otomotiv Sanayii ve Ticaret A.Ş.	Koza Anadolu Metal Madencilik İşl. A.Ş.
Koç Holding A.Ş.	Odaş Elektrik Üretim ve Sanayi Ticaret A.Ş.
Kordsa Teknik Tekstil A.Ş.	Oyak Çimento Fabrikaları A.Ş.
Migros Ticaret A.Ş.	Sasa Polyester Sanayi A.Ş.
Otokar Otomotiv ve Savunma Sanayi A A.Ş. S.	Selçuk Ecza Deposu Ticaret ve Sanayi A.Ş.
Pegasus Hava Taşımacılığı A.Ş.	Sinpaş Gayrimenkul Yatırım Ortaklığı A.Ş.
Petkim Petrokimya Holding A.Ş.	Teknosa İç ve Dış Ticaret A.Ş.
Tav Havalimanları Holding A.Ş.	Tukaş Gıda Sanayi ve Ticaret A.Ş.
Tekfen Holding A.Ş.	
Tofaş Türk Otomobil Fabrikası A.Ş.	
Türk Hava Yolları A.O.	
Türk Telekomünikasyon A.Ş.	
Türk Traktör ve Ziraat Makineleri A.Ş.	
Turkcell İletişim Hizmetleri A.Ş.	
Türkiye Petrol Rafinerileri A.Ş.	
Türkiye Sise ve Cam Fabrikaları A.Ş.	
Ülker Bisküvi Sanayi A.Ş.	
Vestel Beyaz Eşya Sanayi ve Ticaret A.Ş.	
Vestel Elektronik Sanayi ve Ticaret A.Ş.	
Zorlu Enerji Elektrik Üretim A.Ş.	