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Do Financial Markets Price Sustainability Activities?

Finansal Piyasalar Sürdürülebilirlik Faaliyetlerini Fiyatlıyor Mu?

ABSTRACT

With the increasing importance of sustainability, studies on this subject have increased in every field. One of the most important areas affected by sustainability is the financial market. Many new applications have emerged with the integration of markets into this concept. Firstly, the dimensions of sustainability emerged as environmental, social, and governance and formed the concept of ESG. Many concepts have developed, such as sustainability reports where ESG practices are published, sustainability indices that enable firms to monitor their ESG performance, and ESG scores where firms' sustainability activities are calculated by certain organizations. The purpose of this study is to determine whether the market prices firms' ESG activities. In order to find an answer to this question, sustainability indices, where firms' sustainability activities can be monitored, are analyzed. The BIST Sustainability Index, which tracks the sustainability performance of firms operating in Turkey, is used. The effect of the index on the stock returns of the firms included in the index is analyzed. In order to observe the long-term relationship, daily data between 04.11.2014 and 30.04.2024 are used. The model also incorporates control variables to enhance the reliability of the model and its results. First, a meaningful and explanatory model was obtained. Analysis of the results reveals a significant and positive relationship between sustainability activities and stock returns. This significant relationship provides an answer to the research question. In other words, the market positively prices sustainability activities. In this case, firms should integrate sustainability into all their operations. In this way, they will be able to create positive value, make environmentally sensitive contributions, and ensure social justice in the firm's environment as well as for its stakeholders.
Keywords: Sustainability, Sustainability Index, ESG, Stock Return

ÖZET

Sürdürülebilirliğin artan önemiyle bu konudaki çalışmalar her alanda artış göstermiştir. Sürdürülebilirliğin etkilediği alanlardan en önemlisi de finansal piyasalardır. Piyasaların bu kavrama entegrasyonu ile birçok yeni uygulama ortaya çıkmıştır. İlk olarak sürdürülebilirliğin boyutları çevresel, sosyal ve yönetişim olarak ortaya çıkmış ve ESG kavramını oluşturmuştur. ESG uygulamalarına dair yapılan pratiklerin yayınlandığı sürdürülebilirlik raporları, firmaların ESG performansını takip edilmesini sağlayan sürdürülebilirlik endeksleri, belirli kuruluşlar tarafından firmaların sürdürülebilirlik faaliyetlerinin hesaplandığı ESG skorları gibi birçok kavram gelişmiştir. Bu çalışmanın amacı piyasanın firmaların yaptığı ESG faaliyetlerini fiyatlayıp fiyatlamadığının belirlenmesidir. Bu soruya yanıt bulabilmek için firmaların sürdürülebilirlik faaliyetlerinin takip edilebildiği sürdürülebilirlik endeksleri incelenmiştir. Türkiye' de faaliyet gösteren firmaların sürdürülebilirlik performanslarının izlendiği BIST Sürdürülebilirlik Endeksi kullanılmıştır. Endeksin endekse dahil olan firmaların hisse getirilerine olan etkisi incelenmiştir. Uzun vadeli ilişkiyi gözlemleyebilmek için 04.11.2014-30.04.2024 dönemleri arasındaki günlük veriler kullanılmıştır. Modeli ve sonuçları daha güvenilir kılmak adına kontrol değişkenleri de modele dahil edilmiştir. İlk olarak anlamlı ve açıklayıcı bir model elde edilmiştir. Sonuçlar incelendiğinde ise sürdürülebilirlik faaliyetleri ile hisse getirileri arasında anlamlı ve pozitif bir ilişki tespit edilmiştir. Bulunan anlamlı ilişki araştırmanın sorusuna cevap sağlamaktadır. Yani piyasa sürdürülebilirlik alanında yapılan faaliyetleri pozitif fiyatlamaktadır. Bu durumda firmalar sürdürülebilirliği tüm operasyonlarına entegre etmelidir. Böylece hem pozitif bir değer yaratacak hem de çevreye duyarlı katkılar sağlayabilecek, firma ortamında ve paydaşlarına sosyal adaleti sağlayabilecektir.
Anahtar Kelimeler: Sürdürülebilirlik, Sürdürülebilirlik Endeksi, ESG, Hisse Getirisi

1. INTRODUCTION

As the concept of sustainability has become more widespread and significant, organizations have also changed their investment and operational plans. The concept of "sustainability" was initially used by the World Commission on Environment and Development (WCED) in 1987 in a study named "Our Common Future." In this report, sustainability is defined as ‘’ satisfying the needs of the present without jeopardizing the ability of future generations to meet their needs." (Brundtland, 1991). Sustainability efforts necessitate a methodical and long-term strategy. This concept has experienced a gradual transformation and has been combined with ideas such as sustainable development, corporate social responsibility, and environmental, social, and governance (ESG) principles.

The Brutland Report also evaluates the concept of sustainable development. The research emphasizes that sustainable development necessitates the comprehensive consideration of economic, social, and environmental aspects. In recent years, governments have increasingly incorporated environmental concerns and social injustice into their ongoing economic-oriented growth programs. The Sustainable Development Goals were established by the United Nations in 2015 as a strategic plan for achieving sustainable development. The Sustainable Development Goals serve as objectives and strategies for countries, with governments, companies, civil society organizations, and individuals playing a crucial role in their attainment.

At the corporate level, sustainable development is considered a principle of corporate social responsibility. In 1953, H. Bowen introduced the notion of corporate social responsibility, which refers to the responsibilities that company individuals have to align their decisions with the values and objectives of society (Bowen, 2013). Together with the development of sustainability, the concept of corporate social responsibility has now been developed by the European Commission as "the integration of social and environmental issues of enterprises with their organizational activities and interactions with social actors on a voluntary basis." (Commission Of The European Communities, 2001).

Sustainable development has had significant effects on business as it requires a comprehensive approach that considers environmental, economic, and social factors. The governance approach has transitioned from simply focusing on profit to one that considers corporate social responsibility, encompassing financial performance as well as social and environmental concerns. Both corporations and individuals (investors) have started considering sustainability problems when making investment decisions. This increased knowledge has resulted in significant transformations in the financial markets. The conventional profit-driven approach to investment decisions has been redefined, giving rise to the emergence of the environmental, social, and governance approach.

The United Nations report titled "Who Cares Wins" was the first comprehensive exploration of the environmental, social, and governance (ESG) framework. The study aims to integrate Environmental, Social, and Governance (ESG) concepts into the activities and investment decisions of investors, portfolio managers, and firms. (United Nations, 2004). ESG focuses on non-financial institutional assessment by incorporating environmental impact, social responsibility, and governance into investment decisions. The Environmental, Social, and Governance framework applies to the evaluation of non-financial institutions by incorporating environmental effects, social responsibility, and governance into management decisions (Ji et al., 2022).

Within the context of financial markets, the concept of ESG has led to numerous innovative implementations. Companies have initiated the production of reports regarding their activities in the areas of governance, social responsibility, and environmental effects, which they then disclose to investors. Sustainability reporting frameworks have been developed in this context. The Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), the Integrated Reporting Framework (IR), and the Carbon Disclosure Project (CDP) are the main reporting frameworks now being utilized. Initially, these reports are voluntary; nevertheless, with time, they become mandatory. Sustainability reports provide comprehensive documentation of firms' environmental, social, and governance (ESG) performance, encompassing all aspects of their operations. These reports employ both qualitative and quantitative methods to ensure accuracy and thoroughness. The Global Reporting Initiative (GRI) standards are widely recognized and extensively used as the primary reporting standards in this field. Companies prepare

sustainability reports using the framework established by the Global Reporting Initiative (GRI). This framework consists of comprehensive standards that cover economic, environmental, social, and governance issues in great detail (Global Reporting Initiative, 2022).

Sustainability indexes are another innovation that the ESG concept brings to financial markets. Sustainability indices track the performance of firms by applying environmental, social, and governance (ESG) principles. The S&P Global ESG Indexes, the Dow Jones Sustainability Indices, and the MSCI Sustainability Indices are the three leading sustainability indices in the sustainability field. Corporations often demonstrate their commitment to sustainable practices, corporate governance, financial success, and stakeholder engagement through these indexes, which usually consist of a mix of criteria and indicators (Lo et al., 2021).

The BIST Sustainability Index is another sustainability index that gives investors the opportunity to monitor environmental, social, and governance (ESG) performance. The BIST Sustainability Index is a platform that guides companies in the process of formulating policies on environmental, social, and corporate governance risks of exchanges and transmits information. It has been calculated since November 4th, 2014. (Istanbul Stock Exchange, n.d.).

Emerging in the financial markets are new applications focused on sustainability, such as the ESG (Environmental, Social, and Governance) framework, sustainability reports, and the Sustainability Index. These emerging applications have become increasingly important in the process of choosing investment portfolios and assessing the value of organizations. Due to increasing concerns over the environment and social inequality, policymakers have made the region a top focus (La Torre et al., 2020). At the same time, investors currently anticipate beneficial environmental and social outcomes from corporations (Martin, M., 2013). These expectations necessitate the implementation of sustainable practices and the generation of beneficial outcomes by firms.

These advancements in both the business and academic areas have led to the question, "Do the financial markets consider these environmental, social, and governance (ESG) practices implemented by companies?" High Environmental, Social, and Governance (ESG) performance theoretically attracts investors to the company, leading to increased share returns (Tirole, J., Bénabou, R., 2010). Qualified managers have the capacity to achieve more profits than their competitors by selecting profitable ESG projects. Selecting appropriate ESG projects not only enhances returns but also provides greater long-term value (Yoon, A., 2024).

The researchers examined the relationship between sustainability performance, financial performance, and share returns and provided a conclusive answer to the subject in question. The majority of research examines the correlation between annual ESG scores offered by businesses like Bloomberg and LSEG Data & Analytics and financial performance. Research indicates that Environmental, Social, and Governance (ESG) scores have a beneficial effect on financial success.

This study aims to analyze the influence of sustainability practices on share returns. The panel regression analysis will be used to determine the connection between the BIST sustainability index, which measures environmental, social, and governance (ESG) performance, and the share returns of the companies included in the index.

2. LITERATURE

Researchers are examining the impact of ESG practices on business operations due to their growing significance. An investigation is being conducted to determine whether the environmental, social, and governance (ESG) activities and performance of enterprises have an influence on the creation of significant value and the attainment of high returns.

ESG activities include the implementation of operations with the goal of minimizing environmental damage, as well as the implementation of policies and procedures that encourage social equity within organizations. The company's financial success is influenced by all of these actions related to ESG, which are supported by both the agency theory and the stakeholder theory (Jensen, M. C., & Meckling, W. H. (1976), Freeman, R. E. (1984)). In the literature, the impact of sustainability performance within the firm has often been studied in terms of its impact on financial performance or share returns.

Abdi, Y. et al. (2021) examined the correlation between the yearly ESG scores of 38 global airlines from 2009 to 2019 and their selection of topbins q as a financial performance indicator using panel regression. A significant and positive correlation was shown between ESG (Environmental, Social, and Governance) factors and financial performance. In addition, they conducted a separate analysis of environmental, social, and governance scores and discovered that both social and environmental performance had a positive impact on financial performance.

Rahi, A.F. et al. (2021) conducted a study by Nordic financial firms between 2015 and 2019, which found a negative correlation between annual ESG scores and financial performance. They have proposed that the possible cause of the negative correlation is the limited duration of their use of the interval and the requirement for long-term investments to enhance financial performance.

Aggarwal, P. (2013) analyzed the correlation between yearly ESG scores and the financial success of 20 non-financial companies listed on the National Stock Exchange (NSE) from 2010 to 2012. They discovered a correlation that is insignificant between the total ESG score, the community-related score, and financial success. However, they found a significant and negative correlation between financial performance and employee-related, environment-related, and governance-related factors. Nevertheless, the duration of time examined in this study is quite short.

Yilmaz I (2021) evaluated the yearly ESG scores and financial performance indicators of five non-financial companies from developing countries throughout the period 2014-2018. The objective was to examine the correlation between sustainability performance and economic performance. He discovered that the ESG score had a positive and significant effect on financial performance.

Velte, P. (2017) studied the relationship between ESG scores and the financial performance of German Prime Standard companies from 2010 to 2014. The investigation revealed a significant and positive correlation between Environmental, Social, and Governance factors and financial performance.

Lie, J. et al. (2021) assessed the link between share returns and expenditures on social responsibility, as well as the impact of the Sustainability Index (Sri-Kehati Index) and sustainability awards. The study utilized monthly data from Indonesian companies throughout the period of 2015–2018. The researcher discovered an insignificant correlation between the returns on shares and the amount spent on corporate social responsibility. Additionally, he found a positive and significant correlation between the performance of an index and reward receipt and return.

Pernamasari, R. et al. (2024) conducted a study that investigated the correlation between ESG scores and share returns from 2017 to 2021. ESG and social scores demonstrated a significant positive impact on share returns; however, governance and environmental scores had an insignificant effect.

In their study, Yadav, M. et al. (2024) researched the correlation between ESG scores and share returns using yearly data from Indian companies covering the period from 2018 to 2022. Through his research, he discovered a significant correlation between the ESG score and shares' returns.

In a study conducted by Zhang, J. et al. (2018), the researchers investigated the correlation between sustainability news released by firms and their share returns. The study utilized data from companies listed on the Shanghai and Shenzhen Stock Exchanges from 2007 to 2018. The study revealed that the release of sustainability news has a positive and significant impact on stock returns.

In their study, Sandu, D.M. et al. (2023) examined the correlation between share return volatility and the ESG score. They analyzed annual data from European corporations spanning the years 2019 to 2022. He observed a significant and positive correlation between ESG scores and the volatility of stock returns.

La Torre et al. (2020) discovered a significant and positive relationship between ESG factors and share returns. Their study analyzed the monthly equity returns of companies in the Eurostoxx50 index and their ESG, environment, social, and governance scores.

Rzeźnik et al. (2021), Bag, D. & Mohanty, S. (2021), Gül, Y. & Altuntaş, C. (2024), Jin, Y., (2023), and Yin, Y, et al. (2023) studied the relationship between share returns and ESG performance using annual data and found that there was a positive and significant relationship between the ESG score and the share return.

Throughout the literature review, most researchers considered ESG scores provided by different organizations as a measure of sustainability performance. As these scores are computed on a yearly basis, they rely on annual data in the research. However, due to the annual frequency and restricted number of years to gather scores, the time interval has been shortened.

The study is designed to analyze the relationship between sustainability performance and share returns by utilizing daily frequency and long-term time dimensions. This research seeks to make a valuable contribution to the existing literature on the subject. Therefore, it will be feasible to examine the long-term effects of sustainability efforts on companies.

3. RESEARCH METODOLOGY

The study aims to examine the impact of companies' sustainability practices on share returns. The study will utilize a sample of 15 companies that are components of the BIST Sustainability Index and have continued in the index since its launch to the present day. This will generate a data set with a balanced distribution and allow for a clear observation of the influence of the index. For this analysis, we employed the daily data of companies during the time period covering November 4, 2014, to April 30, 2024. The calculation of the return on shares is determined using the following formula (Ross et al., 2005):

$$Return_t = \frac{P_t - P_{t-1}}{P_{t-1}}$$

The research utilized the share return as the dependent variable. The BIST sustainability index is used as an independent variable. In order to enhance the effectiveness of the analysis and outcomes, a model of control variables that may influence the returns of firms' shares has been integrated with the relevant literature.

Table 1: Variables Used in The Study

Dependent Variable	
Return	Daily stock return of companies
Independent Variable	
Xusrd	BİST Sustainability index
Control Variables	
Beta	Volatility of the stock to the market index
Alfa	An indicator that measures the performance of an investment
Xu30	Market Index
Volatility	The magnitude of fluctuations in the price of a stock
Vix	An index that measures the market's future volatility expectation / Korku endeksi
P/E	The ratio of the price of the stock to the profit per share

Panel regression analysis was employed as an analytical method. The Stata18 program was utilized to do panel regression analysis. The research is based on the following established hypothesis:

H1: The sustainability index has an impact on share returns.

H2: The sustainability index has no impact on share returns.

The model for panel regression that has been implemented is as follows:

$$RETURN=\beta0+\beta1DLXUSRD+\beta2DBETA+\beta3DALFA+\beta4DVOL+\beta5DPE+\beta6DLXU30+\beta7VIX+\epsilon$$

4. ANALYSIS AND FINDINGS

The panel data set generated for the study will first investigate cross-section dependency. Afterwards, unit root tests will be conducted to mitigate false regression between the units. To create a more balanced and consistent dataset, the process involved applying the natural logarithm to the BIST Sustainability Index and BIST 30 Index variables.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
RETURN	35730	.001	.03	-.993	.18
LXUSRD	35730	7.495	.726	6.767	9.51
BETA	35730	1.017	.156	.667	1.44
ALFA	35730	.007	.071	-.228	.32
VOLATILITY	35730	35.003	16.876	0	157.081
LXU30	35730	7.442	.688	6.732	9.301
VIX	35730	18.331	7.402	9.14	82.69
PE	35730	14.051	29.024	1.157	473.421

The Pesaran Cross-Section Dependent Test (2004) was employed to examine the existence of cross-section dependency. The hypothesis of this test is: (Pesaran, M.H., 2004).

H0: There is no cross-section dependency.

H1: There is a cross-section dependency.

Table 3. Cross Section Dependency Test Results

Test/Variable	**RETURN**	**LXUSRD**	**BETA**	**ALFA**	**VOLATILITY**	**LXU30**	**VIX**	**PE**
Paseran CD	301.72 (0.0000)	500.11 (0.0000)	36.44 (0.0000)	40.11 (0.0000)	294.96 (0.0000)	500.11 (0.0000)	500.11 (0.0000)	76.90 (0.0000)

The table shows the results of the cross-section dependency test. The probability values of each variable are less than 0.05 in all tests, leading to the rejection of the H0 hypothesis. As a result, ross section dependency has been identified.

Unit root tests were carried out to determine the stationarity of the series. However, given the presence of cross-section dependency, it is necessary to conduct second-generation unit root tests specifically designed to detect and account for cross-section dependency. In this context, the cross-sectionally Augmented IPS (CIPS-2007) test obtained with Pesaran's Cross-sectionally Augmented Dickey Fuller (PESCADF-2007) coefficients and Bai and Ng Panel Analysis of Nonstationarity in Idiosyncratic and Common components (PANIC-2004) tests were used. The hypothesis of these tests is:

H0: There is a unit root.

H1: There is no unit root.

Table 4. Unit Root Test Results

Variables	**Level**		**1.Difference**	
	CIPS	**PANIC**	**CIPS**	**PANIC**
RETURN	-6.42 (0.01)	-7.10 (0.0000)	Stationary at level	Stationary at level
LXUSRD	-1.61 (0.10)	3.61 (0.9999)	-6.19 (0.00)	-6.97 (0.00)
BETA	-1.27 (0.10)	0.1145 (0.9088)	-6.19 (0.01)	-6.80 (0.00)
ALFA	-2.13 (0.10)	-0.35 (0.5568)	-6.19 (0.01)	-5.72 (0.00)
VOL	-1.56 (0.10)	2.94 (0.0766)	-6.19 (0.01)	-10.83 (0.00)
LXU30	-0.07 (0.10)	4.65 (0.0000)	-2.81 (0.00)	-3.87 (0.00)
VIX	-2.61 (0.00)	-2.46 (0.01)	Stationary at level	Stationary at level
PE	-1.16 (0.10)	1.95 (0.06)	-3.24 (0.00)	-12.04 (0.00)

The table displays the results of the unit root test. Given that the probability values of the stock return and VIX variables are both below 0.05, we can conclude that they are stationary at the level. Other variables are stationary after taking their first differences.

There are three models used in panel data regression analysis (Sarıkovalık, V. et. al., 2019). The three models are the fixed-effects model, the random-effects model, and the pooled-effects model. Initially, it is important to conduct tests in order to determine the suitability of the model for the study. The tests being

referred to are the Chow test, the Breusch-Pagan test, and the Hausman test (Breusch, T.S. & A.R. Pagan, 1980), (Chow, G. C., 1960), (Hausman, J.A. (1978).

The hypotheses of the Breusch- Pagan test are as follows:

H0: Pooled Effects Model

H1: Random Effects Model

The hypotheses of the Chow(F) test are as follows:

H0: Pooled Effects Model

H1: Fixed Effects Model

The hypotheses of the Hausman test are as follows:

H0=Random Effects Model

H1= Fixed Effects Model

Table 5. Model Determination Test Results

Test	t-stat	p-value
Chow(F)	1.28	0.2028
Breusch- Pagan	0.29	0.2937
Hausman	2.93	0.7103

Firstly, the Chow (F) test was conducted to compare the pooled effects model with the fixed effects model. Since the probability value is greater than 0.05, the hypothesis H0 is accepted. According to the Chow test, the appropriate model is the pooled effects model.

Then, the Breusch-Pagan test was conducted to compare the pooled effects model with the random effects model. Since the probability value is greater than 0.05, the H0 hypothesis is accepted. According to the Breusch-Pagan test, the appropriate model is the pooled effects model.

Finally, a Hausman test was conducted to compare the random effects model with the fixed effects model. Since the probability value is greater than 0.05, the hypothesis H0 is accepted. According to the Hausman test, the appropriate model is the random effects model.

However, since both test results show that the pooled effects model is appropriate, the study was continued with the pooled effects model.

After determining the model, it is necessary to examine whether it meets the regression assumptions before analyzing the results. These assumptions are heteroskedasticity, autocorrelation, cross-section dependency, and multicollinearity.

Breusch-Pagan/Cook-Weisberg Test and White's test were applied for heteroskedasticity. The hypothesis of the tests is as follows: (Breusch, T. S., & Pagan, A. R. (1979); White, H. (1980))

H0: Variance of error terms is constant (homoskedasticity)

H1: Variance of error terms is not constant (heteroskedasticity)

Since the probability value of the test results is less than 0.05, the H0 hypothesis is rejected. It has been determined that there is a heteroskedasticity problem in the model.

Wooldridge test was performed for autocorrelation (Wooldridge, J.M. (2002)). The hypothesis of the test is as follows:

Ho: There is no first-order autocorrelation in error terms.

H1: There is first-order autocorrelation in the error terms.

Since the probability value of the test result is greater than 0.05, the hypothesis H0 is accepted. There is no autocorrelation problem in the model.

Paseran CD test was performed for cross section dependency (Pesaran, M.H. (2004). The hypothesis of the test is as follows:

H0: There is no cross section dependence.

H1: There is cross section dependence.

Since the probability value of the test result is less than 0.05, the hypothesis H0 is rejected. It has been determined that there is a cross section dependency problem in the model.

Variance Inflation Factor (VIF) value was tested for multicollinearity. If the VIF value is greater than 10, the multicollinearity problem is mentioned. When the VIF values in the table are analysed, since the VIF value of all variables is considerably smaller than the critical value 10, there is no multicollinearity problem in the model.

Table 6. Regression Assumption Test Results

Assumption	**Test**	**Test Statistic**	**P-Value**
Homoskedastisite	Breusch–Pagan/Cook–Weisberg White's	18.75 14795.73	0.0010 0.0000
Autocorrelation	Wooldridge Durbin-Watson	0.043 2.0083	0.8388
Cross section dependecy	Paseran CD	-2.2673	0.0234

Table 7. Variance Inflation Factors

Variable	**VIF**
DLXUSRD	2.300
DLXU30	2.280
DBETA	1.070
DVOL	1.060
DALFA	1.020
DPE	1.010
VIX	1.010
MEAN VIF	1.390

As a result, the pooled effects model constructed to examine the impact of sustainability performance on stock returns has heteroskedasticity and cross-section dependency problems. In order to achieve higher-quality outcomes from the model, robust estimators that consider variations from the assumptions are employed.

To handle the presence of heteroskedasticity and cross-sectional dependence problems in the model, we will proceed by employing an estimator designed to handle these problems. The Beck-Katz, Parks-Kmenta, and Driscoll-Kray estimators are robust estimators that account for heteroscedasticity and cross-section dependence. The Driscoll-Kray estimator is more resilient in situations where the number of observations (N) is greater than the number of time periods (T) (Tatoğlu (2021). On the other hand, the Parks-Kmenta estimator provides more precise findings when the number of time periods (T) exceeds the number of observations (N). The Beck-Katz estimator is known for producing accurate findings in scenarios with a short time length (T) (Hoechle, D. 2007). Because T exceeds N, the Parks-Kmenta estimator has been used in this model.

The robust estimator utilizes a feasible generalized least squares (FGLS) algorithm invented by Parks, R. (1967) and popularized by Kmenta, J. (1986). It effectively addresses issues of heteroscedasticity, autocorrelation, and cross-sectional dependence, ensuring consistent results.

Table 8. Panel Regression Model

RETURN	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
DLXUSRD	.597	.025	24.01	0	.548	.645	***
DBETA	.498	.025	20.06	0	.449	.546	***
DALFA	2.741	.014	200.49	0	2.714	2.768	***
DVOL	0	0	4.89	0	0	0	***
DPE	0	0	7.99	0	0	0	***
DLXU30	.421	.025	17.04	0	.373	.469	***
VIX	0	0	0.31	.758	0	0	
Constant	0	0	1.07	.003	0	.001	
Mean dependent var		0.001	SD dependent var			0.024	
Number of obs		35715	Chi-square			115667.150	
F- test	4709.23	R-squared			0.7459		
Prob > F	0.0000	Root MSE			0.0122		

**** p<.01, ** p<.05, * p<.1*

RETURN=0+0.597·DLXUSRD+0.498·DBETA+2.741·DALFA+0·DVOL+0·DPE+0.421·DLXU30

The equation obtained from the analysis is presented above. All variables in the model, except for the VIX variable, are statistically significant because their p-value is less than 0.05. Based on the model's findings, it is evident that the sustainability index has a significant and positive impact on stock returns. An incremental rise of one unit in the sustainability index corresponds to a 0.597 unit increase in stock returns. The model is considered significant because its F-statistic probability value is less than 0.05. Furthermore, the model explains 74.59% of the relationship between stock returns and the sustainability index. The chosen control variables have an explanatory and statistically significant impact on the model.

5. CONCLUSION

With the increasing importance of the concept of sustainability, the business world has had to integrate with the concept. With this integration, new concepts have entered the world of finance. Environmental sustainability, social sustainability, and governance sustainability are the most important dimensions of sustainability. Although these concepts are novel, social and governance sustainability has been familiar to companies since 1953, when H. Bowen introduced the philosophy of corporate social responsibility.

The concept of environmental sustainability has emerged as a significant phenomenon for humanity, driven by the escalating damage we cause to the environment and the severe consequences of these impacts. Global policymakers and governments are implementing stringent measures to mitigate the harm we cause to the environment. These rules and limits have the greatest impact on companies.

Consequently, the assessment and quantification of ESG activities have gained significance. Companies have initiated the practice of publishing sustainability reports that detail their environmental, social, and governance (ESG) initiatives. As a result, their actions in this field become accessible to the public, easily understood, and able to be assessed. These efforts are assessed and given scores by firms like Bloomberg and LSEG Data & Analytics. Also, stock exchanges have established sustainability indices to track the environmental, social, and governance (ESG) actions and performances of corporations.

The implementation of these practices has led both the business world and academia to ask the question, "Do markets price ESG practices?" Researchers have conducted numerous studies to answer this question. Most research consistently finds a positive correlation between ESG performance, financial performance, and share returns. Previous studies have analyzed this correlation using a time frame of 5 years on average. Given the limited time frame, it is only possible to examine the short-term impact of the relationship.

This study aims to answer the question of whether the sustainability index is priced by the market. The impact of the sustainability index on the stock returns of firms in the sustainability index is analyzed by panel regression analysis. In order to contribute to the literature that observes short-term effects, this study uses 10-year daily data. In order to increase the reliability of the model and obtain more realistic results, control variables affecting stock returns are also included.

The results show that the model is significant and 74.59% explanatory. The sustainability index has a significant and positive relationship with stock returns. According to this result, we observe that the market takes into account the ESG practices of firms and prices positive ESG performances positively. The increasing awareness of responsibility towards environmental concerns and the desire to ensure social justice are increasing day by day, and this situation also affects the investment decision-making process of investors.

When the results are evaluated, as a policy implementation, companies should aim to integrate environmental, social and governance studies into all their operations in order to create long-term value and improve their relations with stakeholders. For these purposes, they should engage in activities that will reduce environmental damage, make positive contributions to the environment, and create a transparent and fair structure for their employees and stakeholders. In this way, it can achieve the opportunity to create positive value by integrating into sustainability developments, whose impact and importance are increasing globally.

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