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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

CAUSAL RELATIONSHIP BETWEEN FINANCIAL VARIABLES AND OIL PRICES AND BIST SUSTAINABILITY INDEX

FİNANS DEĞİŞKENLERİ VE PETROL FİYATLARIYLA BIST SÜRDÜRÜLEBİLİRLİK ENDEKSİ ARASINDAKİ NEDENSELLİK İLİŞKİSİ

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Abstract

Sustainability has caused transformations in financial markets. At the core of these transformations are financing sustainability efforts and creating investment areas for sustainability-sensitive investors. Sustainability indices fulfill these two objectives in capital markets. Therefore, analyzing the determinants of sustainability indices can contribute to sustainability efforts beyond the efficiency of capital markets. The literature focuses on the effects of macroeconomic and financial variables and energy prices on the sustainability index. This study analyses the determinants of the BIST Sustainability Index. Toda & Yamamoto (1995) Causality analysis is applied to monthly 10-year bond yields, CDS and oil prices, and Index closing variables for 2014-2023. Findings show a causality relationship between oil prices and the BIST Sustainability Index. Results indicate that transformation in energy markets may affect the performance of capital markets.

Keywords: Sustainability Index, Financial Markets and Institutions, Oil Prices.
Jel Codes: G12, G30, Q50

Öz

Sürdürülebilirlik finansal piyasalarda dönüşümlere sebep olmuştur. Bu dönüşümlerin temelinde sürdürülebilirlik çabalarının finansmanı ve sürdürülebilirlik hassasiyeti olan yatırımcılar için yatırım alanları oluşturmak vardır. Sürdürülebilirlik endeksleri sermaye piyasalarında bu iki amacı karşılamaktadır. Dolayısıyla sürdürülebilirlik endekslerinin belirleyicilerinin analizi sermaye piyasalarının etkinliğinin

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ötesinde sürdürülebilirlik çabalarına da katkı sunacaktır. Literatür makroekonomik ve finansal değişkenler ile enerji fiyatlarının sürdürülebilirlik endeksi üzerindeki etkilerine odaklanır. Bu çalışma BIST Sürdürülebilirlik Endeksi'nin belirleyicileri incelenmiştir. 2014-2023 dönemindeki aylık 10 yıllık tahvil faizleri, CDS ve petrol fiyatları ve Endeks kapanış değişkenlerine Toda & Yamamoto (1995) nedensellik analizi uygulanmıştır. Petrol fiyatlarıyla BIST Sürdürülebilirlik Endeksi arasında Toda Yamamoto nedensellik ilişkisi bulunmaktadır. Bu sonuç enerji piyasalarındaki dönüşümün sermaye piyasalarının performansını etkileyebileceğini gösterir.
Anahtar Kelimeler: Sürdürülebilirlik Endeksi, Finansal Piyasalar ve Kurumlar, Petrol Fiyatları.
Jel Kodları: G12, G30, Q50

1. Introduction

Sustainability efforts are at the center of the activities of governments and international organizations due to climate change and environmental degradation threatening human life. The success of sustainability efforts depends on the harmonization of different disciplines. Finance is one of these disciplines (Sevilgen & Kılıç, 2013).

The relationship between sustainability and financial markets is becoming increasingly important. While sustainability refers to efforts to improve and protect the environment, social, and governance areas in a balanced manner, financial markets provide financing for economic activities and direct investments. The relationship between these two areas is ensured by considering sustainability criteria in financial decision-making processes. Sustainability-oriented investments are increasingly in demand in financial markets, leading to the development of financial products based on sustainability principles. Likewise, effective management and transparency of financial markets can be an important tool in achieving sustainability goals. Therefore, the relationship between sustainability and financial markets is important in realizing broader goals such as economic development and environmental sustainability (Lagoarde-Segot & Paranque, 2018).

Through sustainable approaches, financial institutions offer eco-friendly products and services to consumers, while capital markets provide investors with current offerings in green finance. In this context, sustainability indices have been integrated into stock exchange evaluations as financial performance indicators within the framework of green finance practices (Orsato vd., 2015). These indices assess businesses' corporate sustainability performance, measuring their ability to meet environmental, social, and economic responsibilities. Companies included in these indices are evaluated based on their economic activities and criteria such as environmental impact, climate change mitigation, human rights, health, and ethical principles (Türkay vd., 2023; Orsato vd., 2015).

This research examines the BIST Sustainability Index for 2014-2023 using the ARDL bounds test to assess how financial variables and energy prices influence it. Previous finance research has investigated the factors that affect sustainability indices, focusing on ESG and reporting performances. The impact of energy prices and macroeconomic variables on the sustainability index has also been studied (Cavlak, 2023). This study aims to expand the limited literature on sustainability index performance by developing a model incorporating energy prices and financial variables.

Identifying the determinants of the sustainability index is important for investors and stakeholders because these factors help them understand the price movements of the index and predict its future performance. Assessing environmental, social, and governance factors means understanding the key elements that influence the sustainability performance of the index, which in turn enables investors and stakeholders to make more informed decisions. Furthermore, identifying these determinants can guide companies to improve their performance on sustainability and help manage sustainability efforts more effectively (Sharma, 2023). Thus, the study's findings may have implications that contribute to sustainability efforts and financial markets.

This paper is organized as follows: Section 2 examines the theoretical background, Section 3 presents the literature, Section 4 deals with methodology and data, Section 5 argues the empirical results, and we conclude this study in Section 6.

2. Theoretical Background

The financial system plays a pivotal role in addressing the challenges posed by climate change by mobilizing capital toward sustainable projects and mitigating climate-related risks. Financial institutions can accelerate the transition to a low-carbon economy Through green bonds, climate-focused investment funds, and sustainable lending practices. Furthermore, by incorporating climate risk assessments into credit ratings and investment decisions, the financial sector can help align market activities with global climate goals, fostering long-term environmental and economic stability (Arzova & Şahin, 2023).

Climate change and environmental degradation are interconnected global challenges that underscore the necessity for integrating sustainability into financial systems. As highlighted in stakeholder theory, the externalities associated with environmental harm emphasize the need for financial institutions to consider the broader societal and ecological impacts of their activities (Zhou et al., 2023).

Modern portfolio theory (MPT) supports this integration by demonstrating how sustainable investments can enhance risk-adjusted returns through diversification into green assets. Additionally, behavioral finance principles reveal a growing preference among investors for environmentally responsible investments, driven by shifting societal norms and awareness of climate risks. These dynamics align with the efficient market hypothesis (EMH), suggesting that markets will reflect these factors in asset prices as climate risks and sustainability disclosures become increasingly material. Thus, sustainable finance is not merely an ethical imperative but a practical framework for addressing environmental challenges while optimizing financial performance (Azam et al., 2023)

There are two views on the impact of businesses' sustainability-related environmental and social responsibility activities on financial performance. The first perspective emphasizes that businesses' sustainability-related environmental and social responsibility activities contribute positively to financial performance by enhancing stakeholder trust and reducing firm risk. Proponents of this view argue that sustainability initiatives signal a company's commitment to long-term value creation, strengthening its reputation and fostering stronger relationships with investors, customers, and

employees. Furthermore, incorporating environmental, social, and governance (ESG) principles into business strategies can mitigate operational and reputational risks, ultimately enhancing firm value. This aligns with stakeholder theory, which posits that addressing the needs and concerns of diverse stakeholder groups is essential for achieving sustainable financial success (Yıldırım et al., 2018).

In contrast, the second perspective challenges the significance of ESG initiatives for financial performance, suggesting that such efforts may be of limited relevance to investors. Critics contend that ESG-related expenditures can divert resources from core profit-generating activities, potentially diminishing short-term financial returns. This view aligns with the traditional shareholder value maximization model, prioritizing financial returns over broader societal or environmental objectives. Moreover, skeptics highlight the potential misalignment between ESG investments and enterprise goals, arguing that excessive focus on sustainability may lead to inefficiencies, ultimately reducing enterprise value (Gürünlü, 2019).

Analyzing the determinants of sustainability index performance can be related to some finance theories. One of these theories is the efficient markets hypothesis. This theory suggests that asset prices incorporate all available information, indicating that sustainability performance, as measured by a sustainability index, should encompass all pertinent factors that influence sustainability (Fama, 1970; Khan et al., 2021).

The effect of sustainability efforts on business stakeholders, particularly investors, is the subject of finance theories. These theories are stakeholder theory, agency theory, and corporate governance theory (Jan et al., 2021). Agency theory focuses on the conflict of interest that sustainability efforts create between shareholders and managers. According to stakeholder theory, businesses' sustainability performance can strengthen their communication with stakeholders. Thus, firm costs and business investment may decrease (Jan et al., 2021; Peng & Isa, 2020).

Various important factors can explain the connection between corporate governance theory and sustainability. Corporate governance theory promotes company transparency and accountability, facilitating more transparent reporting and effective communication of sustainability performance to stakeholders. Moreover, it emphasizes risk management and long-term planning, aligning with sustainability's goal of preserving resources for future generations and ensuring the company's long-term success. A stakeholder-oriented approach, advocated by corporate governance, encourages companies to balance the interests of all stakeholders and develop strategies that create positive impacts in society. Strong corporate governance fosters sustainability integration into business strategies to enhance long-term value creation and align with sustainability objectives (Kocmanová et al., 2018).

Behavioral finance, which explores how psychological factors influence financial decision-making, can shed light on investors' attitudes and behaviors toward sustainable investments. Prospect Theory suggests that cognitive biases, such as overconfidence or loss aversion, shape investors' evaluations of sustainability and corporate sustainability efforts. Perceived risks related to environmental, social, and governance (ESG) factors often drive fluctuations in these indices as investors react to tangible

corporate actions and broader narratives around sustainability. Understanding these behavioral patterns helps explain the interplay between market dynamics and corporate strategies to enhance sustainability performance (Arias Fogliano de Souza Cunha & Samanez, 2013).

The stock market's reaction to sustainability is not universally agreed upon in finance theories. As a result, researchers have examined the factors influencing the performance of stocks related to sustainability. This research seeks to add to the existing knowledge regarding the factors affecting sustainability indices.

3. Literature Review

The literature addresses sustainability index performance in different dimensions. This Section reviews the literature. Studies are examined in two categories according to the sample. Table 1 presents the studies whose samples are from countries other than Turkey.

Table 1: Sustainability Index Studies

Authors	Subject	Findings
Sharma (2023).	Impact of macroeconomic variables on sustainability index.	The study analyses the macroeconomic determinants of India's sustainability index from 2012 to 2021. Empirical findings show that crude oil prices, the Industrial Production Index, the Wholesale Price Index, and the M3 money supply significantly affect the sustainability index.
Drimbetas et al. (2010).	Impact of macroeconomic variables on sustainability index.	According to the GARCH model, 10 years of bond yield and crude oil price affect the Dow Jones Sustainability Index.
Pérez-Calderón et al. (2012).	Sustainability performance of businesses and sustainability index business values.	An analysis is conducted to examine how environmental performance impacts the creation of firm value within the Dow Jones Sustainability Index Europe from 2007 to 2009. The study finds that environmental performance has a favorable influence on the value of company stocks.
Hawn et al. (2018).	Investor reactions to the Dow Jones Sustainability Index.	The study finds that being listed or delisted from the index has no significant effect on stock performance.
Giannarakis et al. (2017).	The impact of the Baltic Dry Index, gold, oil, and USA trade balance on the Dow Jones Sustainability Index.	The empirical findings indicate that the Baltic Dry Index (BDI) positively impacts the Dow Jones Sustainability World Index (DJSIW), suggesting that maritime shipping costs, as a proxy for economic growth, influence the stock returns of socially responsible companies. Additionally, gold, oil, and the US trade balance also tend to have a positive effect on the DJSIW.
Schaeffer et al. (2012).	Oil market and sustainability index.	The results reveal that only two companies saw a decrease in their betas due to participating in the DJSI. Additionally, there were no alterations in volatility or correlation with oil prices for any of the companies.

Arias Fogliano de Souza Cunha & Samanez (2013).	Performance Analysis of Sustainable Investments in the Corporate Sustainability Index (ISE)	The findings indicate that while sustainable investments have displayed appealing attributes like improved liquidity and reduced non-systematic risk, they failed to deliver satisfactory financial results during the evaluation period.
Adetokunbo & Mevhare (2024)	Interconnectivity among economic policy uncertainty, green stocks, and oil prices in the United States	The research highlighted the dynamic relationships between these variables, emphasizing the influence of oil prices on green stock performance
Gökmenoğlu, & Menteş (2023)	Causal relationship between crude oil prices, natural gas prices, gold prices, the Dow Jones Sustainability World Index (W1SGI), and the Dow Jones Industrial Average Index (DJI)	Findings indicated that crude oil prices negatively affect both sustainability and conventional stock market indices, while natural gas prices positively impact the sustainability index.
De Oliveira et al. (2017)	The causal relationship between oil prices and Brazil's corporate sustainability index (ISE).	The findings indicate a significant causal relationship between oil prices and the corporate sustainability index (ISE) in Brazil.

Table 2 reviews the studies sampling the Borsa Istanbul Sustainability Index.

Table 2: Borsa Istanbul Studies

Authors	Subject	Findings
Özçim, (2022).	The Relationship Between BIST Sustainability Index and Macroeconomic Variables.	The study analyses the impact of macroeconomic variables on the BIST sustainability index from 2014 to 2021 using the E-GARCH model. The findings indicate that the exchange rate increases the index's volatility while the interest rate decreases it.
Gürünlü, (2019).	The impact of sustainability efforts on financial performance.	According to the panel data analysis, the sustainability efforts of the businesses in the BIST Sustainability Index do not significantly affect financial performance.
Altınay et al. (2017).	Performance of banking stocks in the BIST Sustainability Index	The research results indicate that the inclusion of banking stocks in the sustainability index does not have a notable impact on the financial performance of these stocks.
Kaya (2023).	The impact of fossil fuel prices on BIST Sustainability Index performance.	Fossil fuel prices affect the BIST Sustainability Index returns.
Cavlak (2023)	The impact of oil prices on sustainability indices in the US and Turkey.	According to the DCC-GARCH model, oil prices significantly affect the dynamic conditional correlations between the US and Turkish sustainable stock indices.
Yavuz (2023)	Dynamic interconnectedness between sustainability indices.	The research indicates that the GCE spreads volatility to the Dow Jones Sustainability Index.
Ertuğrul et al. (2024)	Financial risks affecting businesses in the BIST Sustainability Index.	Findings show that financial leverage has a negative effect on sustainable stocks.
Acar et al. (2021)	Financial and non-financial variables determine the businesses traded in the sustainability index.	The companies traded in the BIST sustainability index are significantly positively affected by the board of directors and auditor features.

Dağıstanlı & Çelik (2023)	The impact of financial performance on sustainability reporting of BIST Sustainability Index companies	According to the logistic regression results, variables other than size have no significant effect on financial performance indicators. However, as firms' financial size increases, they tend to publish sustainability reports.
Doğan et al. (2023)	Causal relationship among the BIST Sustainability Index, BIST 100 Index, S&P Global Clean Energy Index, and S&P GSCI Carbon Emission Allowances.	The research reveals significant volatility spillovers from carbon emission allowances to the BIST Sustainability Index.
Durmusoglu (2025)	The correlation between sustainability performance and financial outcomes within Turkish energy market companies listed in the BIST Electricity Index.	The research highlights a nuanced relationship between sustainability factors and financial performance, emphasizing the strategic importance of sustainability initiatives for long-term financial success.

3. Data and Methodology

This Section explains research design, research method, and data collection.

3.1. Research Design

This study examines the causal relationships between oil prices, 10-year bond yields, credit default swap (CDS) spreads, and the BIST Sustainability Index. The primary aim is to determine whether oil price fluctuations influence the financial performance of firms listed in the sustainability index and affect investor perceptions. Additionally, the study explores whether financial variables, such as bond yields and CDS spreads, exhibit a causal relationship with the BIST Sustainability Index, shedding light on the complex interplay between macroeconomic indicators and sustainability-focused market performance.

The research question guiding this investigation is: "Is there a causal relationship between oil prices, 10-year bond yields, CDS spreads, and the BIST Sustainability Index, particularly in terms of the impact of oil price fluctuations on the financial performance of sustainability index firms, investor perceptions, and financial risk variables?"

3.2. Data Collection

The study examines the causal relationship between the BIST Sustainability Index, oil prices, CDS, and 10-year bond yields. For this purpose, the Toda Yamamoto causality test is applied to monthly data for the period 2014-2023. The analysis period is determined according to the trading date of the BIST Sustainability Index. The data is accessed from Investing, and the logarithm of the data is taken (Investing, 2024). The description of the variables is given in Table 3.

Table 3: Variable List

Variable	Abbreviation	Definition
Bıst Sustainability Index	Logsusin	BIST Sustainability Index monthly closing data.
Oil Price	Logoilav	Average crude oil price.
Bond Yield	Log10y	10 Years Bond Yield
Credit Default SWAP	Logcds	A 5-year CDS (Credit Default Swap) is a financial derivative contract that provides insurance against the default of a borrower's debt obligations over 5 years.

3.3. Research Method

This study applies the Toda Yamamoto causality test. When conducting VAR analysis, information is lost when handling the values of integrated variables that exhibit stationarity in their first differences. Toda and Yamamoto (1995) addressed this issue in their analysis, enabling the examination of data at their original values (Duasa, 2007:87).

The Toda-Yamamoto causality test is suitable for analyzing relationships in time series data without requiring all variables to be integrated in the same order. Unlike traditional Granger causality tests, which necessitate pre-testing for stationarity and co-integration, the Toda-Yamamoto approach circumvents these challenges using an augmented Vector Autoregressive (VAR) model. This method accommodates variables that are integrated at different levels (e.g., I(0), I(1), or higher) by extending the maximum lag length with additional lags corresponding to the highest integration order in the dataset. This flexibility minimizes the risks of pre-test biases and ensures more robust and reliable causality results, even in mixed integration levels among variables (Toda & Yamamoto, 1995).

The method is appropriate for integrated and co-integrated variables and involves determining the maximum degree of integration of the series (Dmax). Furthermore, the optimal lag for the vector autoregression model is established using the Schwarz Information Criterion (SIC). The VAR model can be calculated using the (k) and (Dmax) values with seemingly unrelated regression. Finally, hypotheses are tested using the Wald test (Siami-Namini, 2017: 604).

$$Y_t = a_1 + \sum_{i=1}^{k+D_{max}} \theta_{1,i} X_{t-i} + \sum_{i=1}^{k+D_{max}} \theta_{2,i} Y_{t-i} + \varepsilon_{y,t} \quad (1)$$

$$X_t = a_2 + \sum_{i=1}^{k+D_{max}} \theta_{1,i} X_{t-i} + \sum_{i=1}^{k+D_{max}} \theta_{2,i} Y_{t-i} + \varepsilon_{x,t} \quad (2)$$

The above equations indicate a causal connection between variables X and Y. The Wald test is used to analyze these variables.

4. Empirical Results

The data's stationarity is assessed through unit root tests, four of which display results from the Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) tests.

Table 4: Unit Root Tests

ADF			PP	
	Level	Differences	Level	Differences
Logsusin	-1.871	-6.345***	-4.107***	-9.029***
Logoilav	-1.958	-8.073***	-1.970	-8.376***
Log10y	-1.561	-11.383***	-1.733	-11.362***
Logcds	-2.266	-10.563***	-2.260	-10.639***

*,**, and *** indicate the significance at the 10, 5, and 1% levels, respectively.

Based on the unit root test, it is evident that all variables exhibit stationarity at the initial level, making it appropriate to utilize the Toda Yamamoto causality test on the dataset. Descriptive statistics are presented in Table 5. The results of the tests for heteroscedasticity, autocorrelation, and normality are displayed in Table 6, which are crucial for the VAR model. The VAR model exhibits stability, with normally distributed residuals and no evidence of heteroscedasticity or serial correlation issues. The lag length is determined based on the Akaike Information Criterion.

Table 5: Descriptive Statistics

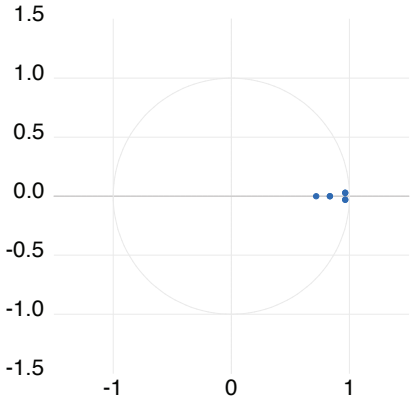
	Logsusin	Logoilav	Log10y	Logcds
Mean	1.466043	4.106360	9.510090	5.823433
Median	0.428856	4.117273	9.436676	5.772734
Maximum	6.900731	4.760463	10.18679	6.731293
Minimum	0.002996	3.046584	8.852236	5.073923
Std. Dev.	2.152513	0.308970	0.325846	0.407965
Obs.	114	114	114	114

Figure 2 shows the inverse root of the AR characteristic polynomial. Since the inverse roots of the AR characteristic polynomial remain within the circle, the model is stable.

Table 6: Normality, Heteroscedasticity, and Serial Correlations Tests

	P-Value
Serial Correlation	0.163
Normality	0.891
Heteroscedasticity	0.825

Tablo 7 shows the empirical results of Toda Yamamoto Causality. Table 7 exclusively displays the findings of the Sustainability Index.



Graphic 1: Stability of the Model

The empirical results show a unidirectional Toda Yamamoto causality relationship between average oil prices and the Sustainability Index. However, there is no unidirectional or bidirectional Toda Yamamoto causality relationship between other variables and the Sustainability Index.

Table 7: Toda Yamamoto Causality Test

Dependent Variables				
Independent Variables	**Logsusin**	**Logoilav**	**Log10y**	**Logcds**
Logoilav	0.034	-	-	-
Log10y	0.702	-	-	-
Logcds	0.551	-	-	-
Logsusin	-	0.909	0.480	0.651

The results indicate no statistically meaningful causality between bond yields and CDS or the BIST Sustainability Index, which is the BIST Sustainability Index. These results are consistent with the literature (Cavlak, 2023; Drimbetas et al., 2010).

The significant effect of oil prices on the BIST Sustainability Index can be attributed to several key factors. Oil prices directly influence the profitability and operational costs of energy-intensive industries within the index, such as the manufacturing and transportation sectors. Fluctuations in oil prices impact these companies' financial performance, affecting their stock prices and overall index composition. Besides, oil price movements can signal broader economic trends and geopolitical risks, influencing investor sentiment and market volatility and impacting sustainable companies' valuation on the BIST Sustainability Index (Shafi et al., 2015; Koçoğlu et al., 2016).

From an environmental sustainability perspective, the significant effect of oil prices on stock market sustainability indices is profound for several reasons. Firstly, fluctuations in oil prices can

influence the profitability and investment attractiveness of renewable energy and clean technology sectors relative to traditional energy sectors within the index. High oil prices may incentivize more significant investment in renewable energy sources, promoting environmental sustainability by reducing carbon emissions and reliance on fossil fuels. Conversely, lower oil prices could dampen investment in clean technologies, potentially slowing progress toward environmental goals (Kilian & Park, 2009).

Secondly, oil price volatility affects consumer behavior and government policies related to energy efficiency and conservation, impacting industries and companies focused on sustainable practices. Lastly, as oil is a finite resource with significant environmental impacts throughout its lifecycle, its price dynamics can influence global efforts towards transitioning to a low-carbon economy and achieving long-term environmental sustainability goals outlined in international agreements like the Paris Agreement. Therefore, understanding and managing the impact of oil price fluctuations on stock market sustainability indices is crucial for advancing environmental sustainability agendas globally (Cong et al., 2008).

5. Conclusions

Sustainability indices are the counterparts of the sustainability theme in financial markets. Thanks to these indices, the sustainability efforts of enterprises can be monitored, and investors with sustainability sensitivity can be offered the opportunity to invest in these enterprises. Sustainability indices can signal the sustainability efforts of businesses and investors' perception of sustainability. Thus, this study investigates the relationship between bond interest rates, CDS, oil prices, and the BIST Sustainability Index.

Empirical findings show that oil prices have a statistically significant effect on the sustainability index. Evidence on the determinants of the sustainability index is mixed. Nevertheless, studies that analyze the Turkish sample support this study's findings. Studies also support a significant causal relationship between oil prices and the BIST Sustainability Index.

The impact of oil prices on Turkey's Sustainability Index, in contrast to the minimal effect of bond yields and CDS spreads, can be linked to the country's economic and structural traits. Turkey's dependency on energy imports positions oil prices as a significant factor influencing macroeconomic elements such as inflation, production expenses, and currency stability, which directly sway corporate performance and investor confidence, critical components of sustainability assessments.

On the other hand, bond yields and CDS spreads mainly represent fiscal policy, anticipated interest rates, and credit risk, which may not adequately reflect firm-specific environmental, social, and governance (ESG) practices essential to the Sustainability Index. Turkey's financial markets are also evolving in incorporating ESG aspects into standard financial measures, which might restrict the relationship between sustainability indices and traditional financial metrics like bond yields and CDS spreads. This distinction highlights the unique significance of oil prices as a macroeconomic factor with a more immediate and concrete influence on sustainability-oriented financial instruments.

The established causal link between fluctuations in oil prices and the BIST Sustainability Index underlines the vulnerability of firms committed to sustainability to broader economic changes, especially in a country like Turkey that relies heavily on energy. Oil price changes directly impact expenses related to inputs, energy, and operational profit margins, all of which are vital for companies that focus on environmental sustainability and energy efficiency. Companies in the Sustainability Index typically pursue ESG-oriented strategies, such as implementing renewable energy solutions or improving energy efficiency, which exposes them more to the volatility of energy markets than companies that are part of non-sustainability-focused indices. This relationship sets the Sustainability Index apart from traditional indices, where company valuations are often influenced primarily by profitability or growth measurements rather than environmental and social factors.

This result has important implications for researchers, the market, and policymakers. Academics may prioritize studying how oil prices influence stock market sustainability, exploring how fluctuations in oil prices impact various sectors of the economy and their consequences for financial markets. Additionally, there may be a rise in interdisciplinary research spanning economics, finance, environmental science, and policy studies to thoroughly assess the broader implications of these dynamics.

Policymakers should reassess energy policies and regulations due to oil price volatility's economic and financial effects. This may involve encouraging investments in renewable energy to decrease reliance on fossil fuels and manage vulnerabilities in the market. There could be demands for stronger financial stability measures to protect against oil price fluctuations, ensuring stability in both the financial system and the broader economy. Moreover, the connection between oil prices and sustainability could shape decisions on climate policy, underscoring the importance of transitioning to cleaner energy sources, especially during periods of high oil prices.

Investors and fund managers may adjust their strategies based on oil price forecasts and their expected impacts on different industries. This can lead to shifts in asset allocations and portfolio diversification. In addition, businesses can reduce the negative impact of conventional energy prices on investors by realizing energy transformations.

This study has some limitations. Since monthly data are used, the model could not include some financial data. Future studies may diversify the financial variables in the model. Besides, further studies can analyze the impact of renewable energy prices on sustainability indexes

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