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The Impact of Changes and Ranking Discrepancies in Sustainability Reporting on Stock Returns

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Abstract

Sustainable investing has been a hot topic among lawmakers, academics, and investors as of late. Here, the goal of both academic research and sustainable investment methods is to compare how well various companies report on sustainability. Despite the attention on sustainability reporting, empirical research is still needed on the relationships among sustainability report errors, stock returns, and the timing of such reports. To analyze the impact of variations and ranking inconsistencies in sustainability reporting on stock returns, this study was conducted. Consequently, 130 Tehran Stock Exchange companies from 2015 to 2022 were analyzed using multivariate modeling and Eviews 9. The ESG, CSP, and CSR indices showed that sustainability reporting significantly impacted stock returns. Furthermore, these three sustainability reporting indices had a comparatively greater influence on prospective stock returns. Additionally, the three sustainability reporting indices had a considerable impact on the stock performance of the following stocks. Both present and future stock returns were adversely affected by inconsistencies in sustainability reporting rankings derived from different sustainability reports. Sustainability reporting, along with changes and inconsistencies in rankings, should be taken seriously by investors and market participants. Moreover, this study could help reduce investor uncertainty about sustainability reporting and encourage sustainable investment by focusing on differences and changes in sustainability reporting rankings across several approaches and years, and on their effects on stock returns. This study also examined how sustainability reporting rankings affect future stock returns. This study identifies discrepancies across various sustainability reporting rankings and examines how they affect stock returns and future performance. This study also contributes to the literature on sustainability reporting in Iran. By emphasizing differences and variations in sustainability reporting rankings across methods and years, and their impact on stock returns, this research aims to reduce investor confusion about sustainability reporting and promote sustainable investment. Moreover, this study focuses on the impact of changes in sustainability reporting rankings on future stock returns.

Keywords:
Ranking Discrepancies, Sustainability Reporting, Stock Returns

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1. Introduction

The worldwide focus on sustainable development has resulted in an explosion of sustainability reporting in financial markets. The Global Sustainable Investment Alliance (GSIA) estimates that by 2020, global sustainable investment will have totaled over $30.7 trillion (Wang et al., 2024). Moreover, from 50% in 2014 to 73% of the world was ready to pay more for sustainable solutions in 2015. Market-based research contends that exemplary implementation of Environmental, Social, and Governance (ESG) initiatives improves corporate financial performance (Hoepner et al., 2016). Therefore, it can be claimed that legislators, analysts, and investors have paid great interest in sustainable investments in recent years. Both sustainable investment practices and academic research aim to measure and compare the sustainability reporting performance of various companies using ESG ranking data. For instance, an increasing number of studies provide theoretical support for the development of sustainability reporting (Gibson, Brandon et al., 2021; Asante-Appiah and Lambert, 2023; Berg et al., 2022; Serafeim and Yoon, 2023; Wang et al., 2024).

Sustainability reporting can help optimize investments, assess risks, and value companies. Many corporations are unable to report on sustainability due to transparency issues or misaligned incentives. For example, to achieve short-term profits, corporations may temporarily or selectively disclose some sustainability components to improve their image and maintain high sustainability rankings. These shifts in the rankings may indicate that corporations are trying to mislead investors with their sustainability reports.

It is also important to note that sustainability reporting is often voluntary, especially in markets such as Iran, where mandatory reporting has not been fully enforced. Because of this voluntary nature, rankings fluctuate, influencing how investors evaluate a company's risks and opportunities. In addition to supporting valuation, risk assessment, and decision-making, sustainability reporting is a valuable tool for investors. However, there are certain uncertainties regarding corporate sustainability reporting that impact the development of sustainable investment. For example, companies may not always be motivated to disclose extensive sustainability reports because Iran does not require mandatory sustainability reporting. They may engage in only more sustainability activities to meet specific objectives each year (Friske, 2023). In this sense, changes in sustainability reporting rankings can be used as a warning sign of misuse of sustainability reporting. Studies by Ahmadi and Rahmani (2023) indicate that company reports are often not well-known and receive limited attention. The Securities and Exchange Organization's corporate governance guidelines (both the old and the new) state that companies should voluntarily report on their sustainability efforts. However, a look at reports from companies listed on the Tehran Stock Exchange shows they have paid little attention to sustainability issues when reporting on their sustainability performance.

This issue highlights the significance of this research, as a more detailed analysis of the impact of discrepancies in sustainability rankings and how they change over time can contribute to improving transparency and the reporting process in Iran. In many cases, these changes may indicate companies' improper incentives to mislead investors or attract their attention through temporary improvements in rankings.

In addition, there is no universally accepted metric for sustainability reporting, and previous studies have used a wide variety of components (Berg et al., 2022). This leads to differences in rankings of sustainability reporting, indicating that people have different opinions on its pros and cons.

These disparities in rankings could result from management's divergent goals for the organization. For instance, managers who are solely concerned with the short term may temporarily adjust rankings to make the company's performance look better. Such changes can lead to

fluctuations in rankings, influencing strategic decisions and potentially boosting short-term stock returns. However, in the long run, these adjustments may result in a decline in future stock performance.

Giese et al. (2019) found that confusion in the financial markets arises from inconsistent and conflicting sustainability reporting rankings. This uncertainty affects investment decisions, corporate financing, reputation, and the formulation of regulations and policies regarding sustainability reporting. Sustainable investment in the Iranian context is affected by ranking inconsistencies and the importance of sustainability reporting. This is because research on sustainability reporting is still in its early stages, particularly for ESG reporting, and there are no mandatory reporting requirements.

The erosion of investor trust and the subsequent detrimental impact on future stock returns might result from changes in sustainability rankings that are driven by unethical business incentives. If investors find out that these rating changes were only cosmetic upgrades to trick the market, they might rethink their investments in those companies.

Consequently, this study is important because it can lead to greater transparency and better investment decisions by examining differences and inconsistencies in sustainability reporting rankings and assessing their effects on stock returns. Additionally, this study can play a crucial role in strengthening the credibility of sustainability reporting in Iran and establishing a more reliable framework for sustainable investments.

Investors are confused by corporate sustainability reporting rankings over the years and several checklists, which reduces their effectiveness and credibility (Chatterjee et al., 2009). Therefore, examining the potential impact of sustainability reporting ranking discrepancies on sustainable investment is essential. In this regard, the primary focus of this study is on stock returns. Economic and financial conditions are reflected in stock returns (Wang et al., 2024) and are useful indicators of the future state of the economy. According to Rahmawati and Handayani (2017), stock returns reflect investors' collective assessment of a company's current profitability.

This work adds to this field's research in various ways. First, while sustainability reporting, particularly ESG about stock returns, is gaining global attention (e.g., Cao et al., 2023; Shanaev and Ghimire, 2022; La Torre et al., 2020), Iranian research has focused on CSR's impact on stock returns, a narrower form of ESG reporting. Furthermore, few studies have explored the role of ESG sustainability factors in stock returns (Marefati et al., 2022). Iranian ESG sustainability reporting can benefit from this study's findings. Second, this study can aid in the development of sustainable investment by clarifying the role of sustainability reporting for investors and highlighting the relationship between stock returns and sustainability report rankings over time. In addition, future stock returns are examined in relation to sustainability reporting rankings and their changes. The importance of this issue arises from the fact that the impact of sustainability reporting may become apparent in the subsequent years (Wang et al., 2024). However, the argument is that if companies aim to improve their sustainability reporting, it will positively affect future returns. Furthermore, if the manager's goal is to achieve personal gains, changes in rankings can decrease stock returns, even if they have a positive effect on stock returns.

Investors can gain valuable insight into sustainability reporting investment opportunities by analyzing how ranking variations affect stock performance. More trustworthy and accurate sustainability reporting, particularly in ESG reporting, can be achieved through research in this area, thereby increasing transparency and efficiency in sustainability reporting rankings. So, it's crucial to study how different sustainability reporting rankings affect stock returns and how discrepancies between them do so. After the theoretical underpinnings and literature review are provided in the next parts, the hypotheses are formulated. The next step is to outline the research technique, which

includes the research models and the sample. Descriptive statistics and model fit are also part of the study's findings. A summary and some suggestions make up the last section.

2. Literature review and research background

2.1 The impact of sustainability reporting ranking discrepancies on stock returns

Disputes between rating criteria can affect the ranking of sustainability performance in sustainability reports. The study also emphasizes how sustainability reporting rankings have evolved with time (Giese et al., 2019). Investors can be confused when sustainability reporting rankings are inconsistent, which can affect stock returns (Wang et al., 2024). According to Serafeim and Yoon (2023), investors' expectations for a company's future performance can vary when sustainability reporting rankings differ, as investors interpret the rankings differently.

ESG reporting is the focus of these studies, while changes in rankings over time and discrepancies across checklists have received little attention. These differences include differences in corporate governance criteria, socioeconomic performance, and other factors.

While ranking differences make it harder for stock prices to reflect value-relevant sustainability reporting news, ESG rankings show what the market expects in the future and can foretell news stories, according to Serafeim and Yoon (2023). Market participants view ESG factors as a credible signal, which, according to La Torre et al. (2020), is associated with higher stock returns. Nevertheless, the majority of this research has ignored differences and inconsistencies in sustainability reporting ranks in favor of ESG reporting. A study by Shanaev and Ghimire (2022) examined how ESG rankings changed over time and found that higher ESG rankings were associated with higher positive anomalous returns.

The optimism bias hypothesis holds that optimistic investors dominate the market and assign higher values than the company's intrinsic value. As a result, stock prices become inflated relative to the company's actual value, leading to decreased stock returns.

The optimism bias leads investors to make more favorable evaluations of companies and hold optimistic expectations for their future performance, creating an unrealistically positive perception of a company's reality. As a result, investors may overvalue a company's stock, driving prices above their true worth. Ultimately, this can lead to stock price inflation and lower future stock returns. Miller (1977) argues that in markets with high selling costs, pessimistic investors are sidelined, and thus, price responses reflect more optimistic valuations.

In this context, optimism bias among investors leads to current asset prices being primarily determined by optimistic investors, who often overestimate a company's prospects. This type of misvaluation, when investors fail to achieve their expected outcomes, results in price declines and lower future stock returns. In other words, since pessimistic investors face short-selling constraints, the price of current assets is primarily determined by optimistic investors, who often overestimate a company's prospects. Consequently, the greater the discrepancy between market stock prices and actual values, the lower future stock returns (Diether et al., 2002; Wang et al., 2024).

Sustainability reporting ranking differences are similar to those in credit ratings and analyst forecasts, reflecting different perspectives and opinions that affect market participants' perceptions of risk and value.

Investing data can be interpreted differently by investors depending on these differences and biases. As a result, their investment decisions may be influenced by unrealistic and often overly optimistic assessments. Studies on credit ratings and analyst forecast discrepancies are relevant to the present study. To give just one example, Ackert and Athanassakos (1997) state that when uncertainty levels rise, analysts are more likely to be positive about a company's future. Stock returns were negatively correlated with the standard deviation of analyst projections. Also, because

these companies tend to be overpriced, Sadka and Scherbina (2007) argue that stocks with a wider gap between analysts' top rankings tend to have lower future returns.

According to Ahmadi et al. (2023, the Iranian capital market is relatively inefficient, and ESG practices are still in their infancy. Analysts and investors in Iran's capital market are unable to do accurate evaluations due to the market's unique sustainability reporting issues. The lack of regulatory mandates for sustainability reporting is a significant problem because it discourages businesses from being transparent about their environmental improvement efforts. Investors and analysts are left confused by sustainability reporting data due to uncertainty caused by inadequate reporting standards and a lack of transparency at the market level. Consequently, market participants may act irrationally or even negatively due to incomplete or incorrect data.

Thus, emerging markets are better suited to behavioral finance theories (Han and Li, 2017) that center on investors' irrationality and the lack of market efficiency. The highest-ranked companies tend to be favored by investors when sustainability reports are inconsistent. As a result, they undervalue future sustainability concerns and overestimate the company's sustainability success. As a result, their stock is overvalued, and their future returns on investment are diminished, according to the optimism bias argument.

This optimism bias in developing markets can lead to misguided investment decisions and artificially inflate stock prices, ultimately resulting in declining future returns.

Optimism bias refers to the tendency of investors to set unrealistic expectations. Additionally, irrational investors exhibit overconfidence and rely more on their own judgments than on available market information. As a result, stock prices are overvalued, leading to lower future returns (Hirshleifer and Luo, 2001). Berg et al. (2022) stated that the effect of ESG performance on stock returns is more substantial than previously estimated. Higher stock returns are associated with differences in ESG rankings, according to Gibson, Brandon et al. (2021). If, on the other hand, the ranking differences are examined year over year, investors may think the firm is consistently improving its sustainability reporting disclosures if the changes are getting better each year. So, if sustainability reporting rankings improve, stock returns and future returns will go up. So, the research hypothesis is as follows:

Research Hypothesis: **Discrepancies in sustainability reporting rankings significantly impact stock returns.**

2.2 Previous research

Several studies, both at home and abroad, have examined how sustainability reporting affects stock returns and how sustainability reporting rankings affect market returns. According to Pahlavan et al. (2024), corporate governance enables greater profit comparability, enhanced stock liquidity, and reduced risk of future stock price declines. However, this study primarily focused on the risk of price declines and measured only the governance component of sustainability reporting. In another study, Hoseini et al. (2021) showed that corporate social responsibility (CSR) negatively and significantly impacts stock return volatility. Although this study focused on CSR, ESG sustainability was not addressed. Abdi et al. (2020) classified the drivers of sustainability reporting into five groups and 24 indices. Environmental requirements, corporate governance features, and the company's structural characteristics were considered the most important factors. While this study ranked the drivers of sustainability reporting, the significance of these drivers was based solely on expert opinions, and no analysis was conducted at the company level. Hashemi et al. (2019) found that the impact of a company's sustainability performance and disclosure on its socio-economic performance, as reflected in excess stock returns, was significant and negative.

Additionally, the effect of sustainability performance and disclosure on a company's profitability was insignificant. Khoshkar et al. (2020) demonstrated that environmental reporting has a significant positive effect on disclosure quality and, through this impact, is significantly associated with stock returns. Although these studies address aspects of sustainability performance differently from ESG reporting, they have not examined the effects of changes in rankings over time. Furthermore, Marefati et al. (2022) argued that ESG sustainability is associated with higher stock returns. Moreover, the COVID-19 pandemic has strengthened the impact of ESG sustainability on stock returns. This study is the closest to the present research; however, several key differences exist. Like other studies, this research fails to account for variations and inconsistencies in rankings across years. Secondly, this study does not evaluate various methodologies for sustainability reporting, including CSR reporting, corporate sustainability performance (CSP), and ESG reporting.

2.3 International studies

There have been numerous international studies as well. Here, Wang et al. (2024) showed that in the Chinese stock market, there is a strong negative relationship between company returns and the lack of consensus in ESG rankings. Additional research shows that differences in ESG rankings can dampen investor enthusiasm, thereby reducing stock returns. In the heterogeneity analysis, this negative effect is more pronounced in state-owned companies, companies with higher ESG ratings, and companies with fewer institutional investors. The corporate governance dimension also plays a critical role in decreasing stock returns. To reduce decision-making bias, investors and decision-makers should consider ESG rankings from multiple rating agencies. Moreover, Berg et al. (2022) examined two new ESG rankings and found that the effect of ESG performance on stock returns, as measured by these methods, is stronger than previous estimates. Gibson Brandon et al. (2021) found a positive correlation between stock returns and ESG ranking discrepancies, suggesting that high-rated companies have larger discrepancies. The main thing driving this partnership is disagreement over the environmental aspect. Various agencies' ESG rankings were studied in these studies, but the effect of changes in rankings over time was not examined. Although ranking disparities make it difficult to incorporate sustainability reporting news about value into stock prices, ESG rankings reflect market expectations for future developments and news, according to Serafeim and Yoon (2023). In their 2020 paper, La Torre et al. contended that stock returns rise when market forces view ESG considerations as a suitable proxy. Without addressing changes in sustainability reporting rankings, these studies primarily focus on ESG reporting. Researchers Shanaev and Ghimire (2022) concluded that higher ESG rankings were associated with higher positive anomalous returns over time.

In this study, as in Shanaev and Ghimire (2022), changes in rankings across years are considered, while discrepancies in rankings are measured using various checklists, as per the methodology of Wang et al. (2024). Although this study differs from and has different reasons than existing research, its main distinguishing feature is that it was conducted in Iran. Due to sanctions, the emerging nature of the economy, and the unstable and uncertain conditions, sustainability reporting in Iran is approached differently than in other countries. Moreover, in Iran, no institutions are dedicated to ranking sustainability reporting, and data on sustainability reporting must be collected via checklists.

3. Research Methodology

Research of this type is descriptive of the correlational type in terms of its nature, as it is applied in terms of its objective, retrospective in terms of its time frame, and applied in terms of its objective. Through regression analysis, variables are examined, and their relationships are analyzed.

Data were collected manually from companies' disclosed reports on the Codal website. After collecting data from the statistical population, the next step is to analyze the data to test the hypotheses. Given the enormous volume of data and the need for processing, Excel and EViews software are used to estimate descriptive statistics, model parameters, and statistical analysis and inference. The research model is estimated using panel data and robust standard regression.

This study includes all companies listed on the Tehran Stock Exchange between 2015 and 2022, as shown in Table 1. After applying the following criteria, 130 companies (1,040 firm-years) remained from the total number of companies listed on the Tehran Stock Exchange. They were included in the accessible population for the study:

1. Holding companies, insurance companies, credit institutions, or banks should not own the companies.
2. The companies must have maintained their listing status on the Tehran Stock Exchange throughout the study period.
3. The companies should not have had a trading suspension of more than three months.
4. Esfand (the last month of the Iranian calendar year) should be the end of the companies' fiscal year.
5. The necessary data for the research must be available for the sample companies.

Table 1. Sample selection process

Limitation	Number of Companies
Statistical Population	389
Companies whose fiscal year does not end in Esfand	(54)
Investing, holding, financial intermediary, or insurance companies	(97)
Trading suspensions of more than three months during the study period	(23)
Companies that remained listed on the stock exchange throughout the study years	(48)
Companies for which data was available and usable	(37)
Final Sample	130

3.1 Research model and variables

Based on the studies of Wang et al. (2024) and Marefati et al. (2022), Model 1 is estimated to test the research hypothesis.

Model 1:

$$\text{Ret}_{it} = \beta_0 + \beta_1 SRDis_{it} + \beta_2 Size_{it} + \beta_3 ROE_{it} + \beta_4 ATO_{it} + \beta_5 ROCF_{it} + \beta_6 \text{MB}_{it} + \beta_7 SOE_{it} + \beta_8 Age_{it} + \beta_9 Inst_{it} + \beta_{10} OwnMng_{it} + \beta_{11} Growth_{it} + \beta_{12} Rec_{it} + \beta_{11} FixRatio_{it} + \varepsilon_{it}$$

In Model 1, if the coefficient β_1 is significant, then the research hypothesis is confirmed. Otherwise, the research hypothesis will be rejected. It should be noted that the model is tested using rankings of sustainability reporting, changes in ranking, ranking discrepancies, and future stock returns to gain a comprehensive understanding of the relationship between sustainability reporting and stock returns.

Dependent variable: stock return (Ret): According to Wang et al. (2024, this is the cumulative return on stocks during a financial year. To calculate Ret, equation (1) is used:

Equation 1:

$$Ret_{it} = \frac{D_t + P_t(1 + \alpha + \beta) - (P_{t-1} + Ca)}{P_{t-1} + Ca}$$

Where:

Dt: Cash dividend paid

Pt: Market value of each share at time t

Pt_{-1}: Market value of each share at time t-1
α: Percentage increase in capital from claims and cash contributions
β: Percentage increase in capital from reserves
Ca: Capital increase from cash contributions paid by investors

Independent Variable: Sustainability Reporting Ranking Discrepancy (SRDis): Two methods are considered to measure this variable.

First method: Similar to the study by Wang et al. (2024), this method extracts information from three types of sustainability reporting checklists (ESG, CSP, and CSR). The standard deviation of these three variables is then considered as a measure of ranking discrepancy. A larger standard deviation indicates greater ranking discrepancies, suggesting fundamental differences in sustainability reporting ranking methods. The following approach is applied to measure the three variables (ESG, CSP, and CSR):

Environmental, Social, and Governance (ESG) Reporting data is collected based on the checklist developed by Fakhari et al. (2017). This checklist includes three indices, 30 dimensions, and 86 components. If a company discloses a component, it is scored as 1; otherwise, it is scored as 0. Finally, the ESG rank is calculated by dividing the acquired score by the maximum possible score. It is important to note that since 20 components from the 86 criteria were not disclosed by any of the companies, they were excluded from the analysis.

According to Amin and Salehnezhad (2020), Corporate Sustainability Performance (CSP) Reporting data are collected using a checklist. This checklist includes seven indices and 47 components. If a company discloses a component, it is scored as 1; otherwise, it is scored as 0. The CSP rank is then calculated by dividing the acquired score by the maximum possible score.

Corporate Social Responsibility (CSR) Reporting data is collected based on the checklist developed by Bahri Sales and Farrokhi (2023). This checklist includes four indices and 20 components. If a company discloses a component, it is scored as 1; otherwise, it is scored as 0. The CSR rank is then calculated by dividing the acquired score by the maximum possible score.

Second method: The sustainability reporting ranking discrepancy indicator is based on changes in ESG, CSP, and CSR.

Control variables

According to the study by Wang et al. (2024), the control variables are as follows:

Company Size (Size): The natural logarithm of total assets.

Return on Equity (ROE): Defined as the ratio of net income to the book value of equity.

Asset Turnover (ATO): Defined as sales minus cost of goods sold, adjusted by total assets.

Operating Cash Flow (OCF): Defined as the net cash flow from operating activities divided by total assets.

Market-to-Book Ratio (MB): Defined as the ratio of the market value of equity to the book value of equity.

Ownership Type (SOE): A binary variable, where if the government or state institutions own more than 50% of the company's shares, it is scored as 1; otherwise, it is scored as 0.

Company Age (Age): Defined as the natural logarithm of the years since the company's establishment.

Institutional Shareholders (Inst): Defined as the percentage of shares owned by institutional investors holding more than 5% of the company's shares.

Managerial Ownership (OwnMng): The percentage of shares company managers own.

Sales Growth (Growth): The difference between the current year's and previous year's sales, divided by the previous year's sales.

Receivables Ratio (REC): Defined as the ratio of net receivables to total assets.
Fixed Asset Ratio (FixRatio): The net property, plant, and equipment ratio to total assets.

4. Research findings

Table 2 presents descriptive statistics for the variables. It is important to note that the research variables have been normalized at a 5% error level. Table 2 shows that the average stock return over the study period was 132.7%, significantly higher than the return from fixed bank interest rates. This return is primarily attributed to the bull market of 2019 and 2020. Similarly, the average sustainability reporting scores for ESG, CSP, and CSR were 20.5%, 23.1%, and 22.6%, respectively. These figures indicate that, on average, companies focus on sustainability reporting from 20% to 23%. The highest value suggests that none of the companies have disclosed more than 50% of their sustainability reports. Furthermore, the ranking discrepancy, calculated based on the standard deviation of the three indices (ESG, CSP, and CSR), is 6.2%.

Moreover, the statistical results indicate that the average company size is 15.96, while the average company age is 3.18 years. The return on equity (ROE) is 46.7%. Similarly, operating income accounts for 20% of total assets; on average, companies have an operating cash flow (OCF) of 11.8%. The market value of equity is approximately 5 times the book value. Institutional shareholders hold 65.3% of the shares, while company managers hold 52.5%. Moreover, enterprises have had an average yearly sales growth of 40%. This sales gain is primarily due to price increases and inflation rather than improvements in production, given the nation's inflation rate. Receivables indicate that, on average, accounts receivable account for 22.7% of total assets in each company. Furthermore, 24.8% of these companies' total assets are fixed assets. In addition, 51.92% of the shares are owned by the government and state institutions.

Table 2. Descriptive statistics of the research variables

Panel A: Continuous variables

Variable	Symbol	Mean	Median	Maximum	Minimum	Standard Deviation
Stock Return	RET	1.327	0.583	7.364	-0.484	2.058
ESG Reporting	ESG	0.205	0.197	0.348	0.083	0.073
CSP Reporting	CSP	0.231	0.233	0.400	0.067	0.094
CSR Reporting	CSR	0.226	0.233	0.433	0.050	0.118
Ranking Discrepancy	SRDis	0.062	0.057	0.133	0.017	0.033
Company Size	SIZE	15.096	14.952	18.029	12.725	1.380
Return on Equity	ROE	0.467	0.464	0.825	0.131	0.200
Operating Income	ATO	0.200	0.168	0.488	-0.002	0.143
Operating Cash Flow	OCF	0.118	0.096	0.395	-0.062	0.121
Market-to-Book Ratio	MB	5.058	3.515	18.337	0.940	4.565
Company Age	AGE	3.018	3.045	3.689	2.485	0.304
Institutional Shareholders	INST	0.653	0.700	0.909	0.204	0.200
Managerial Ownership	OWNMNG	0.525	0.610	0.886	0.000	0.289
Sales Growth	GROWTH	0.400	0.346	1.336	-0.248	0.429
Receivables Ratio	REC	0.227	0.197	0.535	0.036	0.143
Fixed Asset Ratio	FIXRATIO	0.248	0.208	0.623	0.031	0.174

Panel B: Discrete Variables

Variable	Symbol	Percentage 1	Percentage 1
Ownership Type	SOE	51.923	48.077

Table 3 shows the effect of each sustainability reporting dimension on stock returns. It should be noted that robust standard errors were used to estimate the research models, addressing issues such as heteroscedasticity and autocorrelation in the error terms (Peterson, 2009). Additionally, all

research models were estimated to have fixed effects after performing the F-Limer and Hausman tests. Based on the results, all three models are statistically significant, as the p-value of the F-statistic is zero. Additionally, the adjusted R-squared indicates that the defined variables in the models can explain 38% to 41% of stock returns.

Table 3. Results of the impact of sustainability reporting on stock returns

Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
ESG Reporting	4.582**	5.710				
CSP Reporting			2.455**	3.065		
CSR Reporting					1.179*	1.697
Company Size	-0.253**	-2.564	-0.223**	-2.223	-0.252**	-2.488
Return on Equity (ROE)	3.314**	7.380	3.175**	6.808	3.249**	7.044
Asset Turnover (ATO)	-0.815	-1.301	-0.588	-0.929	-0.523	-0.834
Operating Cash Flow (OCF)	-0.654	-1.448	-0.618	-1.319	-0.448	-0.962
Market-to-Book Ratio (MB)	0.298**	24.775	0.289**	23.709	0.290**	24.065
Ownership Type (SOE)	0.740**	2.089	0.682*	1.941	0.647*	1.817
Company Age	-1.247*	-1.809	-0.895	-1.281	-0.876	-1.247
Institutional Shareholders (Inst)	0.828	1.511	0.766	1.394	0.881	1.594
Managerial Ownership (OwnMng)	0.059	0.182	0.088	0.270	0.058	0.190
Sales Growth (Growth)	0.439**	4.114	0.424**	3.827	0.463**	4.166
Receivables Ratio (REC)	0.001	0.002	0.003	0.006	0.008	0.014
Fixed Asset Ratio (FixRatio)	0.595	1.310	0.521	1.128	0.549	1.202
Constant	3.881**	2.406	2.875*	1.703	3.410**	2.023
F-statistic	6.086	5.586	5.566			
F-statistic p-value	0.000	0.000	0.000			
Adjusted R-squared	0.410	0.385	0.384			
Observations	1040	1040	1040			

Note: Significance indicators at the 95% and 90% levels are denoted by ** and *, respectively.

A statistically significant gain in stock returns is evident in Table 3 based on sustainability reporting grounded on the ESG index. Similarly, CSR reporting has a statistically significant positive effect on stock returns at the 90% and 95% confidence levels. Consequently, it can be inferred that greater disclosure in the sustainability reporting framework is associated with higher stock returns. Table 4 shows how indices (ESG, CSP, and CSR) and ranking discrepancies (ESGR, CSP, and CSR) affect stock returns. According to the results, differences in sustainability reporting rankings between the current and previous years do not statistically affect stock returns. However, the rating disparities across ESG, CSP, and CSR confuse investors and negatively affect stock returns at the 95% confidence level.

4.1 Sensitivity test

Considering that sustainability reporting may significantly impact stock returns in the long run, the effects of past sustainability reporting (t-1) and the sustainability ranking discrepancy with a one-year lag on stock returns were also tested. The results are reported in Tables 5 and 6. According to Table 5, an increase in sustainability reporting in the previous year, across all three indices (ESG, CSP, and CSR), is associated with higher stock returns, as the coefficients for these variables are statistically significant at the 95% confidence level. However, compared to Table 5, the impact of sustainability reporting with a time lag is more pronounced on stock returns.

Table 4. Results of the impact of the sustainability reporting ranking discrepancy on stock returns

Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
ESG - ESGt-1	0.694	0.764						
CSP - CSPt-1			0.065	0.081				
CSR - CSRt-1					-1.086	-1.441		
SRDis (ESG, CSP, CSR)							-4.849**	-2.791
Company Size	-0.232**	-2.085	-0.235**	-2.089	-0.242**	-2.169	-0.270**	-2.677
Return on Equity (ROE)	3.433**	6.895	3.414**	6.866	3.404**	6.779	3.207**	6.889
Operating Income (ATO)	-0.848	-1.232	-0.855	-1.239	-0.812	-1.169	-0.650	-1.011
Operating Cash Flow (OCF)	-0.218	-0.427	-0.213	-0.414	-0.256	-0.500	-0.524	-1.113
Market-to-Book Ratio (MB)	0.301**	23.015	0.300**	23.066	0.300**	22.787	0.293**	24.062
Ownership Type (SOE)	0.688*	1.804	0.679*	1.779	0.683*	1.802	0.605*	1.716
Company Age (Age)	-1.874**	-2.209	-1.812**	-2.141	-1.866**	-2.203	-0.992	-1.417
Institutional Shareholders (Inst)	0.731	1.202	0.708	1.164	0.778	1.284	0.590	1.066
Managerial Ownership (OwnMng)	-0.012	-0.032	-0.001	-0.003	-0.119	-0.304	0.231	0.723
Sales Growth (Growth)	0.457**	3.755	0.456**	3.735	0.469**	3.811	0.468**	4.189
Receivables Ratio (REC)	-0.465	-0.725	-0.458	-0.712	-0.476	-0.741	-0.112	-0.190
Fixed Asset Ratio (FixRatio)	0.419	0.833	0.426	0.844	0.484	0.952	0.548*	1.178
Constant	6.556**	3.361	6.449**	3.315	6.704**	3.438	4.790**	2.904
F-statistic	4.833	4.829	4.771	5.590				
p-value (F-statistic)	0.000	0.000	0.000	0.000				
Adjusted R-squared	0.375	0.374	0.371	0.385				
Number of Observations	910	910	910	1040				

Note: Significance at the 95% and 90% levels is denoted by ** and *, respectively.

According to Table 6, stock returns rise after a year if sustainability reporting ranks change. All three indices show this effect, and it's statistically significant with a 95% confidence level. Hence, it is reasonable to assume that future stock returns are higher due to the disparity in sustainability reporting rankings, especially the rise in rankings over a year. Nevertheless, stock returns are unaffected by changes in rankings that occur within the same year. In addition, stock returns are severely affected when sustainability reporting ranks differ by more than 1 year, as indicated by the standard deviation of the three indices.

5. Conclusion and recommendations

In recent years, sustainable investments have garnered considerable interest from investors, scholars, and politicians. In this context, both sustainable investing strategies and academic research seek to assess and compare the sustainability reporting performance of various organizations.

Nonetheless, despite the emphasis on sustainability reporting, two primary concerns arose.

Table 5. Results of the impact of sustainability reporting with a one-year lag on stock returns

Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
ESG Reporting	3.566**	3.705				
CSP Reporting			2.536**	2.876		
CSR Reporting					3.324**	3.491
Company Size	-0.238**	-2.139	-0.249**	-2.261	-0.216*	-1.934
Return on Equity (ROE)	3.357**	6.774	3.253**	6.560	3.374**	6.755
Operating Income (ATO)	-1.075	-1.564	-1.012	-1.486	-0.782	-1.132
Operating Cash Flow (OCF)	-0.228	-0.455	-0.222	-0.451	-0.255	-0.496
Market-to-Book (MB)	0.296**	22.959	0.296**	23.035	0.298**	22.628
Ownership Type (SOE)	0.690*	1.796	0.730*	1.888	0.610	1.599
Company Age (Age)	-1.649*	-1.927	-1.438*	-1.704	-1.813**	-2.147
Institutional Shareholders (Inst)	0.694	1.123	0.721	1.181	0.931	1.543
Managerial Ownership (OwnMng)	0.070	0.188	0.066	0.180	-0.248	-0.635
Sales Growth (Growth)	0.463**	3.868	0.457**	3.876	0.467**	3.814
Receivables Ratio (REC)	-0.390	-0.609	-0.367	-0.573	-0.414	-0.649
Fixed Asset Ratio (FixRatio)	0.517	1.021	0.451	0.902	0.409	0.806
Constant	5.297**	2.692	4.956**	2.509	5.418**	2.745
F-statistic	5.030	4.904	4.893			
p-value of F-statistic	0.000	0.000	0.000			
Adjusted R^2	0.386	0.379	0.378			
Number of Observations	910	910	910			

Table 6. Results of the impact of discrepancy in sustainability reporting rankings with a one-year lag on stock returns

Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
ESGt-1 - ESGt-2	5.865**	6.409						
CSPt-1 - CSPt-2			2.967**	3.749				
CSRt-1 - CSRt-2					5.432**	6.039		
SRDis (ESG, CSP, CSR)t-1							-6.055**	-2.789
Company Size	-0.100	-0.786	-0.071	-0.554	-0.094	-0.726	-0.246**	-2.233
Return on Equity (ROE)	4.094**	8.114	3.817**	7.259	3.916**	7.588	3.452**	6.912
Operating Income (ATO)	-1.210	-1.599	-1.045	-1.357	-0.807	-1.072	-1.079	-1.566
Operating Cash Flow (OCF)	0.162	0.289	-0.001	-0.001	-0.015	-0.027	-0.241	-0.494
Market-to-Book (MB)	0.309**	22.399	0.302**	21.692	0.307**	22.083	0.299**	23.272
Ownership Type (SOE)	0.465	1.027	0.533	1.224	0.597	1.367	0.656*	1.723
Company Age (Age)	-4.416**	-4.382	-4.597**	-4.527	-5.010**	-4.979	-1.588*	-1.892
Institutional Shareholders (Inst)	1.426**	2.124	0.901	1.350	0.741	1.142	0.661	1.090
Managerial Ownership (OwnMng)	-0.042	-0.098	-0.082	-0.189	-0.412	-0.933	0.076	0.205
Sales Growth (Growth)	0.454**	3.506	0.424**	3.220	0.427**	3.318	0.464**	3.956
Receivables Ratio (REC)	-0.283	-0.398	-0.223	-0.302	-0.379	-0.528	-0.306	-0.479
Fixed Asset Ratio (FixRatio)	-0.048	-0.087	-0.061	-0.108	0.009	0.015	0.425	0.849
Constant	11.809**	5.316	12.418**	5.518	14.150**	6.467	6.307**	3.253
F-statistic	4.972	4.317	4.647	4.950				
p-value of F-statistic	0.000	0.000	0.000	0.000				
Adjusted R^2	0.420	0.377	0.399	0.382				
Number of Observations	780	780	780	910				

Note: ** and * indicate statistical significance at the 95% and 90% confidence levels, respectively.

At first, if a company's sustainability reporting rankings go up, it might be a sign that they're serious about sustainability reporting, which investors would take as a sign of sustainable behavior and could lead to better stock returns. Uncertainty among investors has contributed to a decline in stock returns as the gaps between rating reports widen due to discrepancies in the checklists used to analyze sustainability reporting. This study investigated the effects of alterations and ranking inconsistencies in sustainability reporting on stock returns.

Using the ESG, CSP, and CSR reporting indices for sustainability reporting has a positive, substantial effect on stock returns and future stock returns. The impact on future stock returns, however, was somewhat stronger due to these measures. Investors view a company's enhanced sustainability reporting as an indication of its health and future focus, and they pay particular attention to sustainable investments as a result. Stock returns go up because of this. Marefati et al. (2022), La Torre et al. (2020), and Berg et al. (2022) all reached similar conclusions.

While changes in sustainability reporting rankings have little effect on stock returns this year, they dramatically boost returns in the market going forward, according to the data. One possible explanation for this correlation is that when a company's rankings go up, investors start to think that it's really trying to improve the quality of its sustainability reports. Consequently, future stock returns will be higher if sustainability reporting rankings improve. However, in the short term, changes in sustainability reporting rankings cannot be viewed by investors as a signal of enhanced sustainable investment. These results align with the findings of Shanaev and Ghimire (2022).

According to the results, both the present and future stock returns are negatively affected by rankings that are inconsistent or generated from multiple sustainability reporting criteria. As a result, stock returns are affected by investors' muddled thinking, which relies on sustainability reporting rankings for decision-making. Various investor expectations for the company's future might negatively impact stock returns due to differing perceptions of sustainability reporting. Disputes over sustainability reporting rankings can also dampen investor enthusiasm, thereby reducing stock returns. Regarding the reduction in future returns, it should be noted that the price of current assets is primarily determined by optimistic investors who often overestimate a company’s outlook. Optimistic investors will consider the highest sustainability reporting rank when multiple rankings are available. Consequently, the greater the discrepancy between market stock prices and actual values, the lower future stock returns are. Similar findings were reported in the studies by Wang et al. (2024) and Serafeim and Yoon (2023).

In this regard, the psychological effects on investors play a crucial role in their decision-making. Companies with higher sustainability reporting rankings are more likely to be trusted by investors, as they are seen as indicators of stability and reliability. Stock prices can be artificially inflated above their actual value due to price bubbles, which can cause this fact. Consequently, when the market eventually aligns with reality, stock returns may decline.

To be more precise, rising sustainability rankings are good news for investors, as they indicate that report quality and transparency are improving over time. Over the long term, these positive shifts may benefit stock performance. Based on the findings, it is recommended that decision-makers carefully assess a company’s sustainability reporting ranking. The regulatory body should establish requirements to improve sustainability reporting and establish specific standards to reduce ranking variances. Increasing transparency in rankings would help investors make more precise evaluations and avoid decisions based on misleading information. Furthermore, investors should recognize that greater disclosure in sustainability reporting is associated with improved stock returns and future performance. Nevertheless, they should adopt a cautious approach by considering the lowest ranking across various sustainability reporting checklists to mitigate future risks to returns.

5.1 Suggestions for future research

A further analysis of how these shifts impact investor behavior and the prediction of future returns could be conducted, given the importance of ranking changes and their long-term effects. Furthermore, future studies in this area could be facilitated by investigating the relationship between long-term sustainability evaluations and improved stock returns.

The results suggest that decision-makers should carefully consider a company's sustainability reporting ranking. To reduce ranking inconsistencies and improve sustainability reporting, regulatory agencies may issue regulations. Additionally, investors need to know that better sustainability reporting disclosures lead to higher stock returns and future profits, and that positive changes in sustainability reporting can increase returns. Nevertheless, they must also recognize that a prudent approach regarding the lowest rank should be adopted among diverse sustainability reporting checklists to mitigate potential complications with future returns.

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