

# Corporate Engagement with the Science Based Targets Initiative: Financial Implications and Key Motivators

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## Abstract

**Objective:** This study focuses on the Science Based Targets Initiative (SBTi), a voluntary framework that enables companies to set emission reduction targets based on science and aligned with the Paris Agreement to combat climate change in a credible and effective way. The research aims to examine the impact of companies' participation in the SBTi on their stock performance, volatility, and financial risk. It also seeks to identify the key factors that motivate firms to participate in the SBTi.

**Methodology:** The study collects and processes extensive data from SBTi and Refinitiv, utilizing statistical methods such as Difference-in-Differences (DiD) regression analysis and Probit models. It analyses financial variables, carbon emissions, as well as sector and geographic information of more than 4,000 companies, using panel data from 2015 to 2022.

**Results:** The study finds a negative impact of SBTi on stock returns, while volatility and financial risk show no significant changes. Factors such as lower returns, reduced stock price fluctuation, and higher financial risk increase the likelihood of companies joining SBTi.

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**Limitations:** The study acknowledges certain limitations, including the focus on investor reactions to short-term targets and commitments. As more data become available, future research could explore a broader time horizon. Additionally, the study did not assess whether companies are meeting their targets. Lastly, a comparative analysis between companies from different regions and industries was not conducted, but is recommended for future research.

**Practical implications:** The SBTi provides companies with flexibility in achieving their targets, which does not guarantee ambitious measures against climate change. Potential greenwashing practices may undermine investor confidence in the initiative's standards. Firms must set realistic and challenging goals. Therefore, transparency and the integration of environmental commitments into business management are crucial for improving corporate perception and attracting capital, even though the financial benefits of these actions may not be immediate.

**Keywords:** Science Based Targets initiative; climate targets; climate related disclosure; financial impact; corporate motivations

**JEL Codes:** Q5; C23; C25

## 1. Introduction

We are currently experiencing a climate crisis, with new records for global temperatures being set each year (Copernicus Climate Change Service, 2024) and increasing concern about the consequences of climate change and environmental protection (Alsaifi et al., 2020; Pörtner et al., 2022; Nyberg & Wright, 2024). Companies, as major sources of pollution, also face the risks associated with this situation. However, they have the unique potential to drive significant change, due to their fundamental role as economic engines. Thus, climate action is no longer only led by national governments (Romito et al., 2023); firms are now key players. Consequently, companies are under growing pressure to reduce their environmental impact (Bjørn et al., 2022b). They are motivated to address environmental challenges for several reasons: stakeholder pressure (Montgomery et al., 2023; Shimizu & Goto, 2023), direct experience of climate-related damage to corporate operations (Dar et al., 2024), and the pursuit of competitive advantages (Tilsted et al., 2023).

The climate responsibility of companies has led to the establishment of commitments and emission reduction targets aligned with the global warming reduction objectives set forth in the Paris Agreement, which came into effect in 2016 – with the goal of limiting global warming to 1.5°C above pre-industrial levels. These measures implemented by companies can be verified by various entities that have been created over time. The Carbon Disclosure Project (CDP), RE100, Global Reporting Initiative (GRI), and Science Based Targets initiative (SBTi) are some of the corporate initiatives that directly contribute to the pursuit of the green transition and represent private governance mechanisms for addressing social and environmental challenges (Romito et al., 2023). While prior research on firms related to Corporate Research

Sustainability is extensive (Shimizu & Goto, 2023), only a limited number of studies focus on SBT (Gieseckam et al., 2021) or RE100 (Chang & Lo, 2022). Thus, it is essential to identify companies' motivations for participating in such initiatives and to reveal the impact of said participation on firm performance.

The SBTi stands out from other initiatives for its unique approach of standardized external evaluation of targets based on what the latest climate science says. It considers both the company's own emissions and those of its supply chain. Moreover, it is a recent initiative, founded in 2015, which has grown significantly in recent years, reaching approximately 4,000 firms by the end of 2022 and being present on all continents and in a multitude of sectors.

The initiative seems to diverge from the greenwashing tendencies of previous voluntary schemes (Lister, 2018; García-Sánchez et al., 2024) and the gap between rhetoric and action that often characterizes climate governance (Stevenson, 2021). Nguyen and Nguyen (2020), who analysed the determinants of environmental information disclosure, found that return on equity, company size, and financial leverage were influential factors. However, few peer-reviewed literature was found on this topic. Shimizu & Goto (2023) highlight that the benefits of participating in such initiatives are ambiguous, and Faria and Labouton (2020) emphasize the importance of understanding how Science-Based Targets (SBT) methods operate both theoretically and practically.

The effects of environmental strategies on different areas are still being studied today (Shimizu & Goto, 2023), and further research is needed to identify the motives for participation (Gieseckam et al., 2021), particularly in the discipline of finance (Bjørn et al., 2022a). Previous studies have indicated that participating in the SBTi may influence firms' financial performance (Dahlström et al., 2023) and corporate behaviour (Bjørn et al., 2022b), but few studies can be found regarding how companies square their targets with plans and actions (Tilsted et al., 2023).

Thus, the literature reflects a lack of consensus among researchers on the relationship between financial indicators and climate or sustainable actions (Jacobs, 2014). The flexibility companies have under the SBTi regime may lead to climate strategies that protect current market power and profits, potentially jeopardising the achievement of climate and sustainability targets (Tilsted et al., 2023). Regarding the financial impact of joining SBTi, despite its growing popularity, research in this field is quite limited (Dahlström et al., 2023), possibly due to its short existence compared with other initiatives, such as GRI, which has a longer trajectory.

As we aim to address these visible gaps in the body of research regarding science-based targets, two objectives were defined. The first objective is to analyse whether being a member firm of the SBTi impacts its financial performance and to identify the financial indicators affected. The second objective is to determine the factors that influence the likelihood of a company participating in SBTi. Given this context, we explore two interconnected research questions:

Research Question 1 (RQ1): Which of the financial variables analysed are affected by the disclosure of the firms joining the SBTi?

Research Question 2 (RQ2): What are the determining variables that influence the likelihood of companies joining the SBTi?

To investigate these relationships, a sample of 4,869 companies was collected, including some that are members of SBTi. Their information is studied over the years 2015 to 2022 using two statistical models. The study identifies a negative impact of SBTi membership on stock returns, while volatility and financial risk show no significant changes. This could indicate a negative perception by investors, either due to the costs associated with sustainability or their interpretation of membership as a sign of climate vulnerability. Companies with lower stock returns, lower stock price fluctuation, and higher financial risk are more likely to join SBTi.

This study contributes to literature in several ways. Firstly, it provides empirical evidence on how participation in the SBTi initiative affects key financial variables such as stock return, volatility, and Value at Risk 1% (VaR1%), which is essential for understanding the stability and profitability of companies committed to these sustainability goals. It also provides insights into the attractiveness of said firms to investors. Secondly, it analyses the determinants of participation in the SBTi, exploring factors such as financial indicators and the pollution level of the industrial sector to which these companies belong. This offers new perspectives on where SBTs are taking root and growing, as well as where obstacles are more present. This helps understanding the profile of the firms joining the initiative. Lastly, given that the SBTi is a relatively recent initiative, this study addresses a gap in the literature by being one of the first to examine its financial effects and determinants of participation, making it particularly innovative.

The structure of the paper is as follows. Section 2 reviews the relevant information from the existing literature. Section 3 describes the adopted methodology and provides a justification for its selection. Section 4 presents the main findings after the application of the methodology and elaborates on the interpretation of the results. Lastly, Section 5 summarizes the relevant aspects, justifies the highlights, and offers new insights into SBTi from a financial and business perspective, including practical implications, limitations, and potential areas for further research.

## 2. Theoretical framework

### 2.1. Impact of environmental performance on financial outcomes: analysing sustainable practices and SBTi

The impact of sustainable practices on firms' financial performance is contentious, as there is no consensus among experts (Horváthová, 2010). The reviewed literature predominantly indicates a positive influence (Dixon-Fowler et al., 2013; Kyaw, 2020; Lewandowski, 2015). Proponents argue that strong environmental performance enhances financial outcomes for corporations. For instance, Kyaw (2020)

supports the notion that environmentally responsible firms face lower financial risks. However, extensive research on the reaction of capital markets and financial indicators to environmental disclosures has yielded negative results (Alsaifi et al., 2020; Matsumura et al., 2014). These findings vary according to financial and environmental performance metrics (Moreno et al., 2024).

In recent years, studies have increasingly focused on strategies for mitigating climate change impacts (Orazalin et al., 2024), such as implementing environmental management systems (Aragòn-Correa et al., 2020), and setting environmental targets (Dahlmann et al., 2019). Additionally, cooperation among stakeholders has gained attention as a key approach (Bjørn et al., 2022b; Dzhengiz et al., 2023). These strategies are seen as critical for improving environmental performance, which, can enhance financial outcomes, although results on the reaction of capital markets to environmental disclosures are mixed. Some examples include the Science Based Target initiative (SBTi), Renewable Energy 100% (RE100), or Task Force on Climate-related Financial Disclosure (TCFD). The benefits of participating in these initiatives remain unclear (Shimizu & Goto, 2023), highlighting a gap between societal environmental protection trends and profit-driven business activities.

The impact of SBTi as a category of environmental performance on the financial results of participating firms has only recently been empirically explored (Bendig et al., 2022), identifying a gap in knowledge. Bendig et al. (2022) demonstrate a positive association between carbon emissions and two financial indicators, Return on Assets and Tobin's Q, among initiative members. In another recent study, Dahlström et al. (2023) analyse two global portfolios, pairing the stock of SBTi firms with those of comparable companies, finding superior performance in the SBTi portfolio. Both studies suggest that investors may achieve higher returns by investing in firms with climate targets. However, other studies have presented conflicting findings. For example, He et al. (2021) found that being a member of a climate initiative could jeopardise a company's financial performance.

Dahlström et al. (2023) focus on targets approved in early 2020, excluding earlier disclosure periods from consideration. Moreover, these studies examine only firms with approved or achieved targets, excluding those that have merely made commitments. This opens avenues for exploring how financial markets respond to commitments, where firms pledge to set science-based targets that have not yet been validated, potentially alleviating pressure experienced by firms with established targets.

Furthermore, numerous previous studies, including those by Bendig et al. (2022), Romito et al. (2023) and Garcia & Orsato (2020), use the same variables to measure financial performance, such as Tobin's Q, while other alternative variables remain largely unexplored. Thus, we propose stock return, volatility and VaR1%. Based on this discussion, it is reasonable to hypothesize that participating in SBTi positively affects companies' financial indicators:

Hypothesis 1 (H1): Companies joining SBTi tend to experience positive effects on their financial performance.

## 2.2. Joining SBTi: motivations and determinants

The SBTi has significantly expanded its influence, now encompassing a substantial portion of the world's largest companies. According to the initiative's latest progress report, by the end of 2021, the SBTi covered one-third of the global market capitalisation, with 2,253 companies either having set or committed to setting science-based targets (Science Based Targets Initiative, 2022).

Joining multistakeholder initiatives such as the SBTi can help firms overcome self-interest during agenda setting, sending credible signals of commitment and appeasing concerned stakeholders (Sovacool et al., 2023). The SBTi's influence has grown among policymakers and investors, with the Biden administration proposing that major federal contractors set science-based targets (Biden, 2021), and the Norwegian Government expecting the same from state-owned companies (Edgar & Stewart, 2024). The UN's expert group on net zero emissions highlights the SBTi as best practice (United Nations High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities, 2022), and its target-setting methodology is increasingly used as a benchmark for Paris-aligned investments (Bjørn et al., 2022b).

Despite its success, the SBTi has faced critical assessments regarding the transparency and specific methodological choices behind the targets it sets (Day et al., 2022). This can be a double-edged sword, leading some companies to refrain from disclosing such information for fear of negative consequences. However, previous studies have also identified market penalties for non-disclosure (Matsumura et al., 2014). Some studies examine common characteristics among firms that disclose environmental information, such as financial motivations identified by Nguyen and Nguyen (2020). Non-financial determinants of disclosure include industry type (Chand et al., 2022), as well as corporate factors like organizational culture and legitimacy (Shimizu & Goto, 2023). Additionally, research indicates that the firms that commit to these targets tend to have lower emissions (Bolton & Kacperczyk, 2021).

More research is necessary to identify the motivations and determinants that drive firms to join the SBTi. Understanding these factors could provide deeper insights into the adoption of sustainable practices and the effectiveness of such initiatives in promoting corporate responsibility. Upon joining the SBTi, companies voluntarily decide to publicly disclose environmental information. For firms, openly reporting on their environmental management has a significant impact on the market. Critics argue that the details of the methods, company data, and assumptions used in setting individual SBTs are not fully disclosed, thus obscuring how corporations establish their targets (Bjørn et al., 2023). Consequently, firms focus on addressing the most immediate challenges that affect their day-to-day operations (Wright & Nyberg, 2017), or on challenges that keep the expectations of the key stakeholders satisfied to ensure business continuity and growth (Scherer et al., 2013). This perspective may lead companies to neglect interdependencies and broader consequences, overlooking climate challenges that demand comprehensive solutions and collaboration beyond their own operations (Wright et al., 2024).

While several researchers suggest a positive relationship between emissions reduction and competitive advantage (Bendig et al., 2022; Delmas et al., 2015), others argue the opposite, citing a competitive disadvantage due to the associated costs of setting SBTs (Alsaifi et al., 2020; Trexler & Schendler, 2015). This has led researchers to question whether goal setting is driven by genuine environmental concern or by economic factors such as financial benefits (Piper & Longhurst, 2021).

The SBTi faces a fundamental challenge when balancing the need to maintain criteria that are consistent with global emission scenarios while remaining appealing to its corporate clients. Although the SBTi helps companies set targets, it does not prescribe how these targets should be achieved. The stipulated accounting principles allow companies to adopt flexible methods to achieve their objectives. The achievement of climate and sustainability targets may be compromised due to climate strategies that preserve corporate market power and profits due to this flexibility. Cost optimisation results in the allocation of mitigation efforts to minimise global costs, rather than principles of fairness and climate justice. Contrary to what techno-economic scenarios typically depict, this would require faster reductions from high-income nations and less from low-income ones (Williges et al., 2022).

Due to the complexities involved and the various approaches that companies might adopt, it is challenging to deduce the specific motivations and determinants that lead firms to commit to the SBTi (Freiberg et al. 2021; Bjørn et al., 2022b). Therefore, further research is necessary to better understand these factors. Based on the reviewed literature, the following hypothesis is proposed:

Hypothesis 2 (H2): Financial indicators, pollution levels, and the geographic region are determining factors in firms joining the SBTi.

### **3. Methodology**

#### **3.1. Sample of data**

The data sample used in the analyses of this study comprises 4,869 companies, 22% of which are members of the SBTi. The necessary information was collected from Refinitiv, where the values of the selected variables were obtained, including stock return, volatility, VaR1%, carbon dioxide emissions, the region where the company operates, and the pollution level of its sector. We consider the sample size adequate, as previous studies in the field have used similar sample sizes, such as the ones from Romito et al. (2023) and Garcia & Orsato (2020). Romito et al. (2023) used a sample of 594 companies and applied a methodology similar to the one used in this study and achieved conclusive results. These same authors have also employed data extracted from a Refinitiv database in their analysis. Refinitiv is one of the most comprehensive and widely used databases in the field of economic and sustainability data.

The analysis was conducted over the period from 2015 to 2022. Data processing involved the challenge of cleaning and preparing over 8 million daily observations. The result is a panel-structured database consisting of approximately 400,000 monthly observations of said variables for those companies.

Although firms from all continents are included in the sample, the data evidence some biases, since the continents are not equally represented and the companies are mainly large firms (Dobrick et al., 2023). Furthermore, most of these companies belong to the low-pollution sector.

### 3.2. Research model and variables for H1

Equation 1 below presents the regression model we designed, which was used through the statistical method Difference-in-Differences (DiD) to test the research hypothesis regarding the impact of the companies' participation in the initiative on their financial performance (H1). This approach has been widely used in similar effect analyses related to sustainability, such as studies conducted by Muganyi et al. (2021) and Martins (2022).

The DiD model in its most general specification is:

$$Y_{i,t} = \beta_0 + \beta_1 JoinSBTi_{i,t} + \beta_4 Covariates_{i,t} + \alpha_i + \gamma_t + \epsilon_{i,t} \quad (1)$$

As we aimed to analyse the impact of joining the SBTi on three financial indicators (stock return, volatility, and VaR1), we compared the changes in each dependent variable  $Y_{i,t}$  before and after the participation in the initiative, which is identified in the model with the independent variable  $JoinSBTi_{i,t}$ .

Regarding the first hypothesis (H1), the hypothesized positive effect will be confirmed for a statistical significance of the coefficient  $\beta_1$  (p-value <0.05). This would indicate that participation in SBTi has a real effect on these financial variables.

The variable stock return ( $Y_{i,t} = StockReturn_{i,t}$ ) measures the return on the investor's investment, defined as the percentage change in the stock price. The variable volatility ( $Y_{i,t} = Volatility_{i,t}$ ) presents the magnitude of fluctuations in stock prices. With a given level of confidence and over a specified period, the VaR variable ( $Y_{i,t} = VaR1_{i,t}$ ) identifies the maximum expected loss of investment. The variable choice is made based on the literature.

The binary variable  $JoinSBTi_{i,t}$ , considered as an event, takes the value 1 for those companies that joined the initiative during the analysed period (treatment group) and 0 for those that did not (control group). Then, it represents the interaction between treatment and post-treatment period.

We applied a statistical matching in order to construct a control group formed by firms that did not join the SBTi but that are comparable to those that did. As in our study, Romito et al. (2023) also attempted to use this methodology in order to

create a matched sample of companies joining the initiative and non-participating peer companies.

The necessary information was collected from the initiative's database. We identified the companies that participated with commitments or targets in the initiative as well as their participation disclosure dates.

In addition, covariates were included in the regressions to control for additional characteristics and minimise bias. For each model, these variables are the logarithm of carbon dioxide emissions and the remaining financial variables other than the dependent one. Fixed effects for time and unit are assumed for the estimation with the model.

As for all the dependent variables, the assumption of parallel trends was verified and the regression model used to estimate Equation 1 is a linear regression for panel-structured data.

### 3.3. Research model and variables for H2

Equation 2 below presents the other regression model we designed to test the second research hypothesis regarding the determinants of joining SBTi (H2). The mathematical specification is as follows:

$$JoinSBTi_{i,t} = \beta_0 + \beta_1 StockReturn_{i,t} + \beta_2 VaR1_{i,t} + \beta_3 Volatility_{i,t} + \beta_4 CO2TotalEmissions_{i,t} + \beta_5 Region_{i,t} + \beta_6 SectorPollutionLevel_{i,t} + \epsilon_i \quad (2)$$

$$P(JoinSBTi_{i,t} = 1 | StockReturn_{i,t}, VaR1_{i,t}, Volatility_{i,t}, CO2TotalEmissions_{i,t}, Region_{i,t}, SectorPollutionLevel_{i,t}) = \Phi(\beta_1 StockReturn_{i,t} + \beta_2 VaR1_{i,t} + \beta_3 Volatility_{i,t} + \beta_4 CO2TotalEmissions_{i,t} + \beta_5 Region_{i,t} + \beta_6 SectorPollutionLevel_{i,t}) \quad (3)$$

The purpose is to estimate whether and how the independent variables influence the probability of joining the initiative (Equation 3), given that the SBTi is a voluntary programme in which companies decide to participate in.

The dependent variable ( $JoinSBTi_{i,t}$ ) is binary, taking the value 1 for those companies that are members of the initiative and value 0 for those that are not. The set of independent variables are stock return, volatility, VaR1, total carbon dioxide emissions, region, and sector pollution level. For the variables region and sector pollution level, dummy variables were created.

Regarding the second hypothesis (H2), the hypothesized positive association will be confirmed by a statistical significance of the coefficients (p-value <0.05). This would indicate that those factors have a real impact on the likelihood of becoming a member.

As we estimate which of these studied parameters are determinants for companies to join the SBTi, the regression model used for the estimation is a probit model.

## 4. Results

### 4.1. First analysis: financial impact

The first column of Table 1 shows that the variable representing participation in the initiative, called JoinSBTi in our first regression model, has a significant negative effect ( $\beta_1 = -0.0045$ ) on the stock return variable, as the p-value is less than 0.05. According to these results, the establishment of targets or commitments within firms, and therefore the participation in SBTi, has a negative financial impact on the companies in terms of the stocks returns achieved by investors.

For volatility and financial risk models, the p-value, located in the fourth column, is greater than 0.05, indicating no statistical significance for those variables. These results suggest that there is no significant difference in volatility and VaR1% after disclosure between the SBTi group and the group of non-participating firms.

According to the findings addressing the first objective of the study, a negative relationship has been identified between participation in the initiative and companies' stock return. Firms experience a decline in their stock returns following the disclosure of their targets or commitments. However, volatility and financial risk show no changes after the disclosure. These results lead us to reject hypothesis H1, which states that companies joining SBTi tend to experience positive effects on their financial performance.

**Table 1.** DiD regressions for stock return, volatility, and VaR1%

	Stock return	Coefficient	Robust std. err.	t	P> t
ATET	JoinSBTi (1 vs 0)	-0,0045769	0,0018754	-2,44	0,015 0,015
	Volatility (log)	Coefficient	Robust std. err.	t	P> t
ATET	JoinSBTi (1 vs 0)	0,0016932	0,0018819	0,9	0,368
	VaR1%	Coefficient	Robust std. err.	t	P> t
ATET	JoinSBTi (1 vs 0)	0,0085397	0,01110565	0,77	0,44

\*95% conf. interval

Source: Own creation.

### 4.2. Second analysis: determinants to join

As shown in Table 2, it was found that all the variables analysed have an effect on the likelihood of SBTs setting (p-value below 0.05).

**Table 2.** Probit regression model

JoinSBTi	Coefficient	Robust std. err.	t	P> t
Stock return	-0,394406	0,0270993	-14,55	0,000
VaR1%	-0,179878	0,0129228	-13,92	0,000
Volatility	-0,1641458	0,0289181	-5,68	0,000
CO2 Total emissions	-4,07e-08	-2,68e-09	-15,15	0,000
Region Africa	-0,675526	0,2491936	-2,71	0,007
Region Asia	0,5437339	0,0749658	7,25	0,000
Region Europe	1,537558	0,0742789	20,7	0,000
Region Latin America	1,164308	0,2496237	4,66	0,000
Region Oceania	-0,6907866	0,1532344	-4,51	0,000
Low Pollution Sector	2,763662	0,0769948	35,89	0,000
Cons	-8,096576	0,0888525	-91,12	0,000

\*95% conf. interval

Source: Own creation.

Regarding the second objective of the study, we found that companies that produce lower returns to investors, have lower stock price fluctuations, higher financial risk, and pollute less are more likely to be members. Furthermore, firms located in Africa and Oceania are less likely to participate compared to those from the North American region (taken as the benchmark). Firms from highly polluting sectors are also less likely to engage, which is related to the emissions level outcome. These results lead us to accept hypothesis H2, which states that financial indicators, the pollution levels, and the geographic region are determining factors in firms joining the SBTi.

## 5. Discussion

### 5.1. Key findings and interpretation

The analysis reveals that participation in the Science-Based Targets initiative has a significant negative financial impact on companies, reflected in a decrease in stock returns. However, it is important to note that we did not observe significant changes in volatility and financial risk following the disclosure of targets or commitments. These findings contrast with those of Dahlström et al. (2023) and Bendig et al. (2022), who claim that committing to the initiative has a positive impact on firms' financial performance.

Participating in the initiative -and therefore reducing emissions by investing in new technologies or modifying the company's strategy- is a costly process (Alsaifi et al., 2020; Trexler & Schendler, 2015) that may negatively affect stock returns. These costs can reduce the company's profits, potentially having a short-term impact on market perception, making the firm less attractive to investors. This approach is also supported by He et al. (2021), who argue that the high risks and costs associated with participating in sustainable initiatives can harm a company's market value. Additionally, Nygaard (2023) highlights the expensive approval fees that firms must pay. Investors could perceive participation in the initiative as a highly expensive investment and a potential distraction from core business activities, driving them away. Piper & Longhurst (2021) argue that while climate commitments may be seen as a desirable secondary benefit, they are not seen as a priority.

Companies in the SBTi make commitments that, once validated, become targets. If a firm does not show progress towards achieving its SBTs, investors may begin to question the environmental strategy being followed (Tilsted et al., 2023). Crilly et al. (2016) state in their study that firms entering the initiative set targets that are unachievable or that they are not interested in attaining. Thus, commitment could be used as a greenwashing tool. Trexler & Schendler (2015) also criticize the effectiveness of SBTs in achieving targets, and Giesekam et al. (2021) observe a lack of information regarding the progress of these climate goals. The promises made by these firms may be viewed with scepticism by the market until the effective execution of emission reduction is demonstrated. While SBTs signal a commitment to sustainability, they do not necessarily translate into action. This could shed light on our findings, as even though targets are set by firms, they do not necessarily pursue or achieve them.

The findings of Bjørn et al. (2022b) show that only joining the initiative does not have any significant positive impact on emissions, meaning that firms must continue their efforts after joining. This realisation of targets into observable achievements could affect the financial indicators analysed, yielding different results. Additionally, it could also be a determining factor for shareholders when choosing these companies.

In our second analysis, we found that firms with lower returns to investors, lower stock price fluctuations, and higher financial risk are more likely to be members. Companies with high financial risk might join SBTi as a strategy to mitigate future risks associated with climate change. These characteristics suggest that companies are seeking to improve their attractiveness to investors by adopting SBTi. Eubank (2023), in their study on SBTi, observed that some benefits of adopting SBTi include the ability to obtain sustainability certification and to maintain a leadership position amidst existing market competitiveness. However, it has already been demonstrated after examining the market response that neither VaR1% nor volatility are affected after joining, while stock returns are negatively influenced. Thus, although our second analysis demonstrates that these financial factors are indeed determining characteristics of the companies that join the initiative, the first concluded with a

lack of positive relationship between participation in these initiatives and financial performance.

We also observed that firms with low levels of carbon dioxide emissions may join the initiative earlier than those with high levels, which is related to our other finding which states that firms from less polluting sectors are more likely to join. Bolton and Kacperczyk (2021) also found evidence that companies engaged in climate initiatives tend to have a smaller carbon footprint. Shimizu & Goto's (2023) research reveals that companies' participation in climate initiatives, such as SBTi, is primarily driven by strategic considerations -such as improving brand image and competitive position- rather than a genuine interest in environmental sustainability. This could explain our results, as the low emissions of these firms may represent a competitive advantage that they want to highlight and use as a marketing tool. Firms in polluting sectors would need to make greater efforts because their targets are more complex to achieve and more expensive. In contrast, firms in low-pollution sectors may be able to reinforce their position and reputation through SBTi without the necessity of making significant additional changes or investing as many resources.

Therefore, our findings indicate that participation in SBTi does not directly increase shareholder value and merely serves as an incentive to promote environmental responsibility, or at least to project the appearance of doing so.

## **5.2. Practical implications**

SBTi is a partnership between the United Nations Global Compact, the World Wide Fund for Nature (WWF), the World Resources Institute (WRI), and the Carbon Disclosure Project. This initiative assists companies in setting scientifically justifiable climate targets to reduce carbon emissions following climate science. Companies enter the initiative by publicly disclosing their commitment and progress toward validated emission reduction targets. It provides participating firms with methods, guidelines, resources, and tools to establish decarbonization targets. However, after setting the targets, the SBTi grants companies with autonomy to implement the necessary actions for their target achievement. However, this does not guarantee that the executive team will not decide to apply unambitious and uncertain measures to address climate change (Tilsted et al., 2023).

The potential greenwashing practices detected could jeopardise investor confidence in SBTi standards. Companies with low carbon emissions, being the most likely to join, should not forget that their commitments must be challenging as well as realistic and achievable. Transparency from companies in communicating their progress towards a zero-emissions future could prevent accusations of greenwashing and strengthen their reputation and trust within the market.

Corporate leaders must integrate environmental commitments into their management model as both an ethical and business imperative. According to the literature,

adopting SBTs can be perceived as a commitment to sustainability, enhancing corporate perception and attracting capital (Eskander et al., 2024). Adherence to the initiative may serve as a market differentiation tool to attract environmentally conscious stakeholders, yet nowadays it is almost a basic requirement for operating in the market (Shimizu & Goto, 2023). Furthermore, firms adopting SBTs aim to adapt to the current environment and create long-term shared value (Shimizu & Goto, 2023). Due to this broader vision, the benefits of the actions taken may become more evident in the future, as their financial impact is not immediately observable.

Stakeholders are increasingly interested in obtaining accurate and comprehensive information on firms' sustainable performance (Xie et al., 2024), as they increasingly consider this factor in their investment decisions (Zhang & Lucey, 2022). Investors must carefully assess the company's future capacity to meet its environmental commitments, as fulfilling the SBTs often requires transforming current business models (Tilsted et al., 2023), which can be initially costly.

### 5.3. Future research and limitations

This study is limited to observing investor reactions to the establishment of targets and commitments using a short-term approach. Galindo-Manrique et al. (2021) argue that environmental practices create long-term value for investors. Our results do not show impacts on volatility and financial risk during the period studied. Therefore, future research could cover a longer time horizon, allowing for the study of longer-term trends and changes.

Whether the emission reduction targets established by companies under the initiative are being met was not considered. Extending this research could involve exploring potential discrepancies between the financial performance of companies that have achieved their targets and those that have not yet done so.

The market perception of such announcements could vary according to the industry and/or geographic region analysed. Concern towards sustainability, local conditions, and investor expectations and priorities are some factors that change according to context. These were not considered in this analysis, so another line of research could focus on providing a comparative approach between SBTi companies from different regions and industries, shedding light on variations in financial indicators.

### 5.4. Conclusions

Our study has revealed a relationship between participation in the SBTi and financial performance, as we found a negative impact on stock returns. However, we did not observe significant changes in volatility or financial risk. These results challenge the prevailing narrative that sustainability always leads to better financial

performance and suggest that investors might view companies' climate commitments with caution, perceiving them as costly investments.

Our findings also indicate that companies with lower stock returns, higher financial risk, and lower carbon emissions are more likely to join the SBTi. Participation in the initiative could be motivated by strategic reasons, such as enhancing reputation and attracting investors, rather than a genuine commitment to sustainability. Our conclusions support concerns about greenwashing, as some companies -particularly those with lower carbon footprint- may use the SBTi as a marketing tool to legitimize their practices and bolster a greener image without making substantial changes to their operations or business models.

The methodology employed in this research included a difference-in-differences analysis to assess the impact of SBTi participation on financial performance, as well as a probit model to identify the determinants of the decision to adopt SBTs.

Our results have significant practical implications for companies, investors, and the SBTi itself. Companies should carefully consider the costs and benefits of joining the SBTi. Firms should also develop strategies to attract investors without making unsubstantiated promises. Investors should critically evaluate companies' sustainability claims and demand greater transparency in the implementation of climate goals. The SBTi should focus its efforts on companies fitting the identified profile and explore measures to encourage genuine climate action while discouraging greenwashing practices.

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