Why corporates join the Science Based Targets initiative

A mixed-method study on the Fortune 500

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WHY CORPORATES JOIN THE SCIENCE BASED TARGETS INITIATIVE

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EXECUTIVE SUMMARY

The global wicked problem of climate change forces us to policymaking, implementation, and climate action. In a hopeful attempt to reach the ambitious Paris Agreement goals, science indicates that collaborative action and science-based targets are required. Consequently, the political arena recognizes the importance of actors beyond national governments for collaborative climate action. These non-state and subnational actors could have a great impact on global emissions reductions, but current targets and pledges are often subject to a lack of transparency and greenwashing practices. In addition, current commitments and actions are often too modest in ambition to close the emission gap. As a response, a plethora of International Cooperative Initiatives (ICIs) has arisen. This research focuses on the promising and important role of corporates in non-state climate action, by assessing corporate determinants for participation in the Science Based Targets initiative (SBTi). To date, the SBTi is the most prominent ICI in the corporate landscape with more than 1,500 companies that are committed to science-based targets. Due to its popularity and rapid growth of the initiative, the SBTi evidently contributes to global emission reductions.

With their step-wise process to science-based target commitment, development, and validation, the SBTi promises to prevent "the worst effects of climate change". To track the progression of this hopeful promise, a handful of studies have been conducted on the SBTi's emission mitigation. However, the literature on the SBTi has remained inextensive. Furthermore, why corporates participate in the initiative was unaddressed. This thesis work is pioneering in the sense that it creates a novel, important, and relevant contribution to fulfilling this knowledge gap, by identifying determining factors for participation in the SBTi. Thereby, assessing associations between firm characteristics and SBTi participation, in addition to whether and how these firm characteristics and several motives, reasons, and drivers cause a corporate to participate.

To this end, we have constructed a mixed-method study with a sequential explanatory design that entailed econometric statistical analysis and interviews. The group of corporates selected for the study was the Fortune 500 of the year 2015, which marks the start of the SBTi. We conclude that this research design is a good fit for the type of study which aims to find relations between firm characteristics, motives, reasons, drivers and SBTi membership, or climate action in general. Mostly because our approach allowed for a more comprehensive picture of relevant factors to participate in the SBTi, compared to extant literature that is often lacking on detailed information due to exploratory designs that assess association rather than causation. We, therefore, want to shed light on the added value of semi-structured interviews in this work and potential future work, despite some of our main limitations of data availability, relatively small sample sizes, and selection bias.

We found that determining factors for corporates to participate in the SBTi relate to the concepts of *Legitimacy, Market Success, Social Insurance* and *Organizational Culture*. The latter added an angle that did not seem covered by the concepts derived from previous studies, while this concept became one of the most influential but controversial in management and organization studies. Our findings show that the pressure of stakeholders such as investors, competitors, the U.S. government, employees, end-consumers, and purchasers is an important determinant for corporates to participate; whereby we have shown that joining the SBTi is unexpectedly

mainly driven by purchasers rather than end-consumers in the U.S. at this point. In addition, competitive pressures cause a company to join since corporates want to maintain their front-running position, find peer benchmarking important, and are experiencing peer pressure within their sector. Furthermore, a corporate's perception of internal and external leadership is important in deciding to join the SBTi. In particular, a firm's strategy and CEO determine whether the corporate wants to be a leader by joining the SBTi or not. On top of that, we found that the presence of a sustainability committee increases the likeliness of a firm becoming a SBTi member since it connects sustainability expertise in the organization that is needed to feed top management so that sustainability decisions can be made.

Interestingly, contrary to our expectations, our results show that corporates in the energy sector are not the most likely to join the SBTi. Albeit those companies are facing impressive stakeholder pressures, they often choose to lobby against future policies rather than set science-based targets. Moreover, we expect conservative corporate culture and the maturity of a sustainability program to influence the decision to join the SBTi. To specify, we believe that conservative corporates, possibly with a mature sustainability program, tend to stick to their system-centric targets and management processes rather than participating in the SBTi.

Overall, our pioneering research outcomes contribute to the inextensive body of academic literature on the SBTi, and it enriches the extant literature on ICIs participation, voluntary initiative participation, and corporate climate action in general. Moreover, the implications of this research are important to policymakers, government, as well as corporates, and the SBTi, in terms of responding to the determinants for SBTi participation. Especially because it is expected that the number of SBTi members will exponentially grow soon, thereby further enhancing the initiative's prominent character. In addition, we argue that SBTi membership is and will not be a form of corporate greenwashing. We also think that SBTi members will environmentally and financially perform better in the long term, due to continuously aligned targets with science, and growing pressure and recognition of the SBTi by stakeholders.

Our study implies that the SBTi will most likely see a pattern of early adopters, the frontrunners; and late adopters, the followers or the firms that experience difficulties with emission identification. However, one should also be aware that there will be a group of outliers, identified as the corporates that will not voluntarily participate in this initiative, or corporate climate action in general. Yet, it requires global collaboration of the entire corporate landscape to close the emission gap. Therefore, our findings are valuable in the sense that they can aid different stakeholders to develop more effective strategies for encouraging businesses to develop a sustainability agenda. Thereby, understanding what motivates corporates to take climate action is important for policymakers, since the effectiveness of policies also depends in large part on how firms will respond to them.

To reach the tipping point in which companies cannot deny joining the SBTi, we recommend the SBTi to focus on targeting new sectors, firms with conservative corporate cultures, and mature sustainability programs. As well as responding to this expected growth within their own organization and establishing a network of experts and corporates which aids in scope 3 identification. In turn, we advise corporates to join forces that support emission identification and disclosure in comprehensible language. Furthermore, our results encourage corporates to establish an organizational structure that enhances collaborative action and sustainable decision-making, for instance with a sustainability committee and dedicated leadership. Additionally, purchasing companies should use their power to trigger a cascade of science-based targets amongst the supply chain. Moreover, corporates should always lobby for

science-based climate policies, even when forms of voluntary climate action are already present. It is thereby up to the government to engage with corporate communities that promote climate policy formation, formulate policies on compulsory emission identification, and join forces with the SBTi to promote the advantages of standardized science-based targets by understanding what truly drives corporates to take voluntary climate action. Following our work, there is abundant room for formulating more detailed policies, investigating additional external pressures that affect corporates to join, and zooming in on each individual sector to account for existing sector differences.

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This thesis marks the end of my journey as an EPA student at the TU Delft. It were two remarkable years in which I learned a lot, in which I experienced challenge, rewards, and a lot of joy. This thesis is written in both Amsterdam, as well as Cape Town, the Mother city. This was an experience for which I am extremely grateful, and which made me even more realize that the work related to this Masters program and my thesis is of utmost importance.

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And of course thanks to you, the reader, for showing interest in my work.

Eva van Hilten
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CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS

CSR - Corporate Social Responsibility
EU - European Union
ICI - International Cooperative Initiative
NSA - Non-state and Subnational Actors
SBTi - Science Based Targets initiative
U.S. - United States
WRDS - Wharton Research Data Services

1 INTRODUCTION

1.1 PROBLEM BACKGROUND

The climate crisis is a global wicked problem, that forces us to policy-making, implementation, and climate action [Incropera, 2016]. The urgency of climate action is high, and requires effective collaboration [Zhongming et al., 2020]. Such collaboration was noticed for the first time during the establishment of the Paris Agreement, which legally bound 196 Parties with the objective of keeping the global warming below 1.5-2°C [United Nations, 2022b]. The goal of the Paris Agreement seems ambitious, and reports that were recently published even indicate that our climate commitments are not on track to meet these goals [United Nations, 2022a]. However, in a hopeful turn of events, science indicates that target setting towards net zero greenhouse gas emissions has the potential to reach the Paris Agreement temperature limit [Höhne et al., 2020; Climate Action Tracker, 2020]. For that, we need both short- and long-term targets that are science-based [World Resources Institute, 2021a].

In order to reduce our global emissions in line with the Paris Agreement, the importance of actors beyond national governments for collaborative climate action has been recognized by political attention [United Nations Environment Programme, 2020]. These actors are defined as non-state and subnational actors (NSAs) such as cities, states, regions, companies, investors, foundations, civil society organizations, and cooperative initiatives [Hsu et al., 2018]. Together, their potential impact could be a reduction of 15-23 $GtCO_2$ emissions per year by 2030, while their current impact is estimated at a reduction of 0.2-0.7 $GtCO_2$ per year by 2030 [Hsu et al., 2018]. Therefore, it is obvious that commitments and actions must go far beyond the targets and pledges that are currently made by individual actors or initiatives, but how NSAs are expected to strengthen governmental actions in order to reach their potential emission reduction remains fairly vague [Streck, 2021].

1.1.1 Why is the focus on corporates?

As indicated, there are many different NSAs that could contribute to closing the emission gap. This research focuses on corporates in specific, and their role in collective corporate climate action. While exact quantitative data on total potential emission reductions for corporates in particular is unknown to the knowledge of the author, The Carbon Majors [2017] published a breakthrough report on corporates' shocking amount of global emissions. The report describes that a relatively small number of 100 companies were responsible for 71% of global emissions, indicating that their share of emissions is relatively large. At the same time, indicating that corporate efforts to reduce emissions could be impactful. CDP [2019], to mention an example, investigated that if the key suppliers to the largest corporates would use only 20% more renewable energy, there is potential to reduce global emissions by 1Gt, which is equal to emissions of Brazil and Mexico combined. There is thus strong evidence that the share of corporates in global GHG mitigation could be large, and that their role in the global climate action agenda is promising as well as important.

1.1.2 Why is the focus on the SBTi initiative?

Albeit this strong acknowledgement of the major role of corporates in closing the emission gap, it is also known that corporate climate actions and their targets and pledges remain insufficient [Hsu et al., 2018]. To further complicate matters, it is seen that pledges and targets of corporates that are not legally bounding are often misleading, and progressions are lacking transparency. Thereby, both contributing to a corporate's greenwashing practices [Delmas and Burbano, 2011; World Resources Institute, 2021b; Carbon Market Watch, 2022]. As a response, a plethora of International Cooperative Initiatives (ICIs) have originated in the corporate landscape, to amplify the credibility of pledges, and to enhance the disclosure of emission reductions and other climate actions. The role of ICIs in the global climate negotiation process progressively became more important, and a rise in the actual number of ICIs has been seen [Widerberg and Pattberg, 2015]. While the importance of ICIs has been criticised by some researchers [Widerberg and Pattberg, 2015; Hsu et al., 2018], others admit their high level of ambitions [Lui et al., 2021; Smit and Kuramochi, 2020; Chan et al., 2018] by shedding light on ICIs' potential to reduce emissions, spur technological development, form the bridge towards more ambitious climate policy, and create momentum for other initiatives and climate action, also beyond the corporate landscape.

This work focuses on one prominent ICI, the Science Based Targets initiative (SBTi). The SBTi is a joint initiative from the World Wide Fund for Nature (WWF), the World Resources Institute (WRI), the UN Global Compact, and CDP. It is currently the most popular corporate climate initiative in the ICIs landscape [Blok, 2022; Giesekam et al., 2021]. The SBTi encourages corporates to set carbon reduction targets that are in line with the scientifically set pathways that have a high probability of restricting global warming to either 2°C or 1.5°C [SBTi, 2022e]. Within the research period of this thesis, the number of companies that committed to science-based targets via the SBTi has increased from 1462 to over 1500 companies since 2015 [SBTi, 2022a]. This reflects the popularity and rapid growth of the initiative, and thereby its potential impact on global emission reductions.

1.2 ACADEMIC AND SOCIETAL RELEVANCE

The SBTi promises to contribute to preventing "the worst effects of climate change" [SBTi, 2022e]. While its exact quantitative impact has received little attention to date in the academic literature, a few authors show promising effects of the SBTi on emission mitigation [Lui et al., 2021; Ruiz Manuel, 2021]. In line with these promising results, the research of Giesekam et al. [2021] shows that the majority of the early adopters of the SBTi are on track with their targets assessed. However, on the flip side, corporate determinants for participation in the SBTi remained unaddressed in academic literature, which is why they recommended it for fruitful future work. Namely, it helps in understanding what reasons these global players have for joining this popular initiative in particular, which can provide guidance for the SBTi and insights for non-participants in their decision to join or not. In addition and from a more general perspective, it helps in identifying corporate determinants for changing their climate change mitigation practices, specifically with regard to climate action in the form of voluntary initiative participation.

This thesis work is pioneering in the sense that it creates a novel, important, and relevant contribution to fulfilling this knowledge gap, by identifying determining factors for participation in the SBTi. Thereby, also contributing to the inextensive body of literature on the SBTi, and enriching the extant literature on ICIs participation, voluntary initiative participation, and corporate climate action in general.

With regard to its societal contribution, this study's findings could be important to policy-makers, the government, the SBTi, and corporates in terms of understanding the current corporate climate agenda, voluntary initiative participation in general, SBTi participation, and understanding the driving forces for it. Thereby, pointing relevant actors towards a general policy direction given the conclusions that could be drawn. In other words, how we can positively influence the current regime and vice versa by our findings, to increase corporate climate actions, and in particular the number of credible science-based targets.

1.3 LINK WITH MASTER PROGRAM

Climate change is a real global wicked problem [Incropera, 2016]. It is a central issue in the political arena, where thresholds for GHG emissions and necessary policies are formulated, in order to protect the planet against climate catastrophes. Thereby, also protecting the citizens of the world against serious damage such as extreme weather events, disruption of food systems, and several diseases [World Health Organization, 2021]. With many actors involved in the cause and mitigation of this wicked problem, non-state actors such as corporates that take climate action are also of high relevance. Not only to protect our people and planet, but also from an economic perspective, particularly as climate becomes a focal component of annual budgets for governments, corporates, and other actors around the globe. This research is tied to the Engineering and Policy Analysis MSc program due to its strong focus on the current climate crisis and necessary actions involved to protect people, planet, and profit. It covers a societal grand challenge, in which clear and effective policy is a must.

1.4 RESEARCH OBJECTIVE

This section outlines the research question, followed by three related sub-questions. These sub-questions are answered throughout Chapters 2 and 5 of this thesis, in the general discussion, and at the end of the relevant section. Subsequently, the research methods are described including the scope and main limitations of the methodologies.

1.4.1 Research question

From the aforementioned, it became clear that the prominent SBTi has the potential to mitigate global GHG emissions. By that means, the initiative contributes to the necessary collaborative corporate climate action agenda that must go beyond the targets and pledges that are currently made, in order to reach the Paris Agreement temperature limit. From the current gap in literature and the need for climate change mitigation, we can conclude that identifying the determining factors for corporates to participate in the SBTi is a relevant contribution to both academic and societal work. Hence, seeking to help define what these factors for taking part in the SBTi are, the research question is the following:

"Why do corporates participate in the Science Based Targets initiative?"

1.4.2 Research design

The research design entails a mixed-methods approach involving two complementary approaches: quantitative and qualitative methods that represent a sequential

explanatory design [Creswell, 2014]. Prior to performing both methods, a literature and desk research was conducted to create a guiding framework on why corporates join the SBTi, which could be used as a stepping stone to the empirical work. Thereby, an overview of five concepts is presented, to categorize potential determining factors for a corporate to participate in the SBTi. In this study, these factors cover a wide range of potential motives, reasons, drivers, and firm characteristics that potentially influence corporates in their decision to join. Arising from this literature review, a set of ten hypotheses could be formulated to test potential statistical relationships between factors related to firm specific characteristics and SBTi participation in the quantitative study. In addition, the literature review functioned as a starting point for complementary insights to the quantitative and qualitative results.

Foremost, the value of the study's research design can be found in the complementarity of the qualitative findings to the quantitative findings and vice versa. Namely, the quantitative results show what firm characteristics are associated with SBTi participation, while the qualitative results assess potential other factors for SBTi participation, such as corporate motives, reasons, and drivers. The former thereby assesses whether factors related to specific firm characteristics are associated with SBTi participation, something that could not be achieved with the interviews, mostly due to the relatively small sample size and the subjective nature of the qualitative study. The latter, on the other hand, investigates the needs and desires that could cause a company to join the SBTi, something that requires detailed information which could not be obtained trough quantitative analysis. Thereby, providing insights in causality between certain factors and SBTi participation, rather than limiting the study to assessing associations between firm characteristics and SBTi participation.

Furthermore, the research design allowed for the use of quantitative results as input for the semi-structured interviews, and for richer detail of the quantitative findings by providing qualitative insights in return. In addition, an overall increase in the generalizability of the research is noticeable, since the relatively small sample size of the qualitative research is enhanced by the larger sample size of the quantitative research. The triangulation in this study thereby increases the credibility of the results and thus the study outcomes.

Methodology

A literature and desk research was conducted prior to the empirical analyses. To this end, the literature review guide of Siddaway et al. [2019] was followed, meaning in the search for literature the scope of the review was considered by familiarizing with current literature, different terminology was considered, search terms were created, and inclusion and exclusion criteria were looked at. Both academic and gray literature such as corporate reports and working papers were considered, and three electronic databases were assessed to develop a robust and reliable summary of extant literature. Resulting from the narrative literature review, a set of 10 hypotheses could be formulated as input for the quantitative analysis, and the review provided complementary information to both quantitative and qualitative outcomes.

Subsequently, statistical analysis was performed to test the hypotheses. To this end, data was collected from the databases COMPUSTAT and BoardEx, both accessible through Wharton Research Data Services (WRDS), and the website of the International Lean Six Sigma Institute. The statistical analysis allowed us to find empirical relationships between the dependent variable of SBTi membership and several independent variables that served as proxies for the hypotheses. Motivated by theoretical knowledge on econometric panel data models, OLS regressions were performed while accounting for unobserved industry effects. Furthermore, other fixed effects models were performed by incorporating time, and firm fixed effects;

in addition to a discrete choice model to assess the effect of a different functional model form. Therewith, also allowing us to test for robustness of the results. All the statistical tests were performed using IBM® SPSS® Statistics software (version 28.0.1.1).

Then, to add richness and more detail to the overall work and to understand the quantitative results, interviews were conducted via Microsoft Teams or Zoom. The interviews yielded insight into the perception of different types of experts in the field, who were obtained through expert sampling and convenience sampling. Qualitative analysis was subsequently performed according to the approach of Miles et al. [2018], meaning that contents of the interview notes were classified according to several concepts of determining factors for SBTi participation, after which substantive points within each classification were further categorized.

Scope

The group of corporates selected for the study was the Fortune 500, which is the annual ranking of America's largest companies based on annual revenue [Fortune 500, 2021]. Thereby, ensuring that corporates with publicly available information were represented. The annual ranking of the year 2015 was chosen, which marks the start of the SBTi. To provide comparability in the sample over time and to be able to control for observable and unobservable predictors, quantitative data on this sample was collected for the years 2015, 2016, 2017, 2018, 2019, 2020, and 2021, for which the most recent data at the time of writing could be collected for the analysis. With regard to the qualitative sample, eight interviews were conducted with experts that either worked for a Fortune 500 company in the quantitative sample, the SBTi, or a consulting firm that advises corporates on science-based target setting and SBTi participation.

Limitations of the methodology

Despite its advantages, some key points of the research with regard to the mixed-method approach need to be mentioned to ensure the reader's valid interpretation of the study outcomes. The overarching limitation of a mixed-method design is its time-consuming character, which sometimes worked against the researcher given the time constraints of the thesis. With regard to the quantitative research stream, the first limitation is the sample size. Although the sample size of the quantitative research elevated the generalizability of the overall conclusions; the sample was subject to selection bias, and insufficient data availability or access resulted in a final sample size of only 138 corporates used for statistical analysis. These difficulties in data collection also affected the accuracy and quality of some proxies. Furthermore, the choice of models ignored the fact that the panel data is censored, implying that the sample period ends before firms potentially join the SBTi in the future. Moreover, one would always have the limitation of ignoring other potentially relevant independent variables, which is a result of time and data limitations, and perhaps biased views of the researcher.

When looking at the qualitative analysis, key limitations can be found in the sample selection that resulted from expert and convenience sampling, which are based on the researcher's judgment and subjective choice of participation. Thereby, potentially excluding relevant subsets from the sample. This resulted in a set of participants with different backgrounds, expertise, and employers. While comparing their insights might be less valid than comparing people who work for, for example, the same organization, the broad variety of the interviewees might represent the population as whole better, thus creating more generalizability of the results. Nevertheless, one should also consider the relatively small number of interviews conducted for the qualitative analysis, thereby underrepresenting the total population. This

implies that, in general, the overall generalization of the research outcomes requires carefulness of the reader.

1.4.3 Research sub-questions

Following from the main question and the research design, the following sub-questions arise:

SQ1: *"Why are corporates involved in climate action, ICIs and voluntary initiative participation according to previous research?"*

The objective of the first sub-question is to identify determining factors for corporates to take climate action, and participate in ICIs or voluntary initiatives in general. The reason for choosing these three literature streams stems from three assumptions that were made due to the inextensive body of literature on the SBTi. These assumptions were based on the SBTi's characteristics: the SBTi is a prominent ICI, it is an initiative with a voluntary nature, and it represents a form of corporate climate action. Flowing from the literature, a framework of five concepts representing factors ranging from different firm characteristics, motives, reasons, and drivers was established that functioned as a guiding framework for the empirical work.

SQ2: *"What factors are associated with SBTi participation?"*

The second sub-question assesses the relationship between factors that are related to specific firm characteristics and SBTi participation by using econometric statistical analyses. This provided insights in the firm characteristics of SBTi members, that might have an influence on the decision of a firm to join the SBTi. The objective of this sub-question is thus to gain knowledge on firm characteristics related to SBTi membership, which could be explained in more detail in the qualitative research phase. Thereby, also providing input for the semi-structured interviews.

SQ3: *"How do different factors influence the decision to participate in the SBTi?"*

The final part of the research involved semi-structured interviews with a two-folded objective. First, the conducted interviews allowed for more detailed information on the quantitative outcomes, to be able to explain whether and how certain firm characteristics influence a firm in its decision to join the SBTi. Second, the qualitative insights added richness to the overall study by including other determining factors for SBTi participation such as motives, reasons, and drivers. The third sub-question is thus complementary to the quantitative outcomes, and thereby adds detail and richness to the complete work.

1.5 READING GUIDE

The report structure follows the logic of the sub-questions listed above. **Chapter** 2 starts with providing the reader with background information on the topic of corporate climate action and ICIs, and outlines a brief overview of the SBTi. **Chapter** 3 presents the extensive narrative literature review to formulate hypotheses and to assess SQ1. The mixed-method design is further elaborated upon in **Chapter** 4, which highlights the methodology and methods that were used. **Chapter** 5 presents the quantitative and qualitative analysis results that were produced, thereby assessing SQ2 and SQ3, respectively. The main findings, the study's validity, contributions, and methodological limitations are discussed in **Chapter** 6. Finally, the research is concluded in **Chapter** 7, providing implications, policy recommendations, and a presentation of fruitful areas for future work.

2 BACKGROUND INFORMATION

2.1 THE URGENCY OF CLIMATE ACTION

At the time of writing, climate change is the defining crisis according to United Nations [2022b]. The climate crisis is global, yet enforces inequality in a way that the most who will be affected are often the ones that are exposed to the biggest climate catastrophes, while having the least resources to adopt mitigation solutions [Roberts, 2001]. The complexity of the crisis also lies in decision-making and policy formation. Often, divisions of citizens about climate change are noticeable along political lines, while a scientific consensus has already been reached [Marchau et al., 2019].

As logical as it may seem, the responsibility of human activity that causes climate change [Trenberth, 2018], is as big as the responsibility of humans to take climate action [Naustdalslid, 2011]. Striving towards a more sustainable world has a major influence on economic and social resources [United Nations, 2021]. Therefore, it is argued that collaboration must be at the heart of climate action [Zhongming et al., 2020]. In 2015, for the first time such great collaboration was noticeable during the establishment of the Paris Agreement, which legally bound 196 Parties with the objective of keeping the global warming below 1.5-2°C [United Nations, 2021].

2.2 SCIENCE BASED TARGETS

Up to now, the collective goal of the Paris Agreement has been considered as ambitious. From 2015 onward, we have seen that global CO_2 emissions resumed growth that even accelerated in the year 2018 [Dimitrov et al., 2019]. Several researchers argue for the improbability to bring the temperature limit of the Paris Agreement within reach [Höhne et al., 2020; Dimitrov et al., 2019; Geiges et al., 2020; Geden, 2016]. However, in a hopeful turn of events, other research shows the good intentions of the Paris Agreement have the opportunity to reach its goals [Climate Action Tracker, 2020; Höhne et al., 2021]. For instance, the analysis of Höhne et al. [2021] significantly shows that targets setting towards net zero GHG emissions has the potential to reach the Paris Agreement temperature limit. In Figure 2.1, it can be seen that there is considerable momentum in setting net zero GHG emission targets, which could make the Paris Agreement temperature limit a reality. The assessments of Höhne et al. [2021]'s study estimate that the net effect of targets that are long-term oriented have the ability to reduce global warming by 0.8–0.9 °C when compared to where emissions are heading currently, which gives us hope.

However, we should keep in mind that not all policies and targets that are focused on short-term actions are in line with the net zero emission goals the Paris Agreement has for the world by mid-century [Höhne et al., 2021]. Nevertheless, to accelerate climate action it is necessary to commit to short-term action by setting 5 to 10-year targets that are science-based and that take into account the scale of reductions required for global warming to stay below 1.5 °C from pre-industrial levels. These short-term science-based targets will provide a trajectory to reduce GHG emissions to net-zero [World Resources Institute, 2021b].

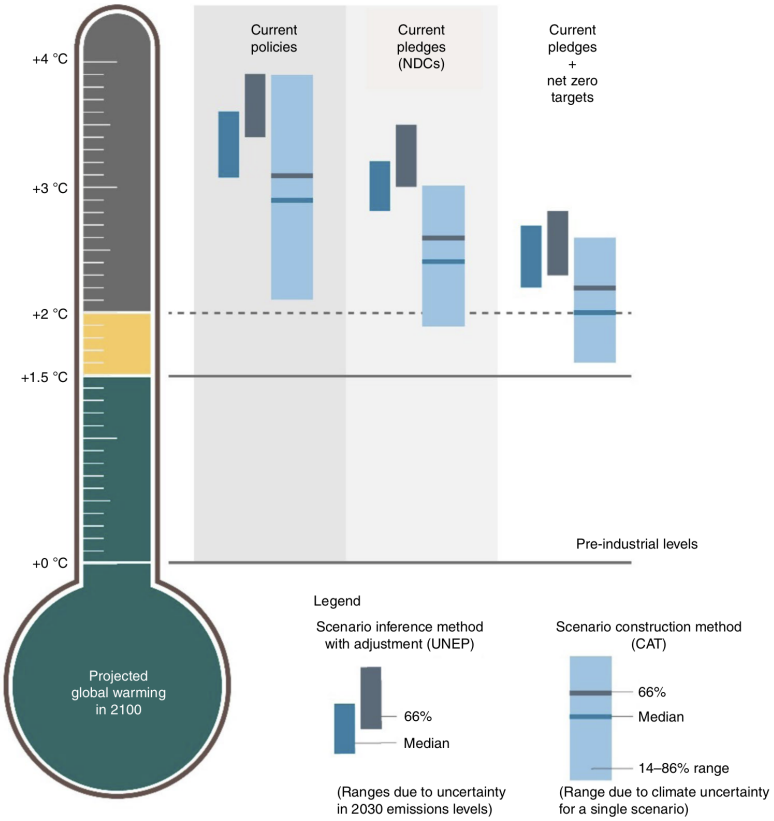

Figure 2.1: The effect of net zero target setting on temperature increase estimations in 2100. It is shown that net zero targets have the potential to reach the Paris Agreement temperature limit. This figure is extracted from the analysis results of Höhne et al. [2021].

2.3 CLIMATE ACTION & THE ROLE OF NON-STATE ACTORS

In the context of climate action, it is known that global climate change governance is diversifying quickly. Today, not only national governments play a major role [United Nations Environment Programme UNEP, 2020], but political attention has been recognizing the importance of non-state and subnational actors such as cities, states, regions, companies, investors, foundations, civil society organizations, and cooperative initiatives [Hsu et al., 2018]. NSAs can take individual climate action or can cooperate with other NSAs or national governments. It is thereby argued that non-state climate action should go beyond identifying the potential direct impacts on GHGs [Chan et al., 2021]. Therefore, to move engagement to address climate change from rhetoric to actual actions we need assessments on achieved reductions and indirect impacts [Chan et al., 2021], interaction between non-state actors with policymakers [Smit and Kuramochi, 2020], construction of effective implementation partnerships, clear mitigation and adaptation goals records, and increased accountability of NSAs [Streck, 2021]. The efforts of NSAs have high potential in emission reduction and have the ability to bridge the 2030 emissions gap, but their current impact is still low. Meaning, their impact could be up to 15-23 $GtCO_2$ per year by 2030, while additional emission reduction contribution that is currently pledged until 2018 by NSAs was 0.2-0.7 $GtCO_2$ per year by 2030 [Hsu et al., 2018]. In addition, NSAs can act as orchestrators when implementing climate policies together with national governments, play a major role in building confidence in governmental policies, and inspire other national and global climate actions [Hsu et al., 2018].

However, what NSAs are expected to contribute to the Paris Agreement goals, how they can complement and strengthen governmental actions, and how they should be held accountable remains vague [Streck, 2021].

What we do know is that in order to realize the potential from NSAs, commitments and action must go far beyond current pledges that are made by individual actors or single initiatives [Hsu et al., 2018]. To further complicate matters, current pledges and targets that are largely not legally bounding Hsu et al. [2016] are often related to greenwashing practices due to lack of transparency or clear scope or boundaries [World Resources Institute, 2021b]. In terms of its definition, greenwashing is a phenomenon in which many firms are engaged, whereby customers are misled because business activities are not actual efforts to establish a more sustainable business [Delmas and Burbano, 2011]. The report of Carbon Market Watch [2022] identified such misleading green claims from big corporates. For instance, Nestle claims to have emission reduction of 50% by 2030 compared to 2018, while the calculations are based on false baselines and some emission sources were excluded. Moreover, the lack of transparency is also reflected in sustainability reports, which disadvantages the relation between corporates and investors [Fernandez-Feijoo et al., 2014]. There is thus need for transparent targets and data reporting to track and verify climate actions and to gauge whether the sum of the efforts of NSAs will prevent the global temperature from warming by 1.5 °C. In this context, a plethora of International Cooperative Initiatives have arisen.

2.4 THE ROLE OF ICIS IN CLIMATE ACTION AND INTERNATIONAL NEGOTIATION

Great progress of ICIs has been made to date. Between COP15 in Copenhagen in 2009 and COP21 in Paris in 2015, the potential of ICIs to close the emission gap became frequently discussed in climate reports, ICIs became more pronounced in the UNFCCC [Widerberg and Stripple, 2016], and the role of ICIs in the overall climate negotiation process has become more important due to several possible reasons [Harrison, 2014]. First, emission reduction pledges and commitments of governments become truly ambitious when targets are set together with NSAs. Second, domestic or economic reasons could hinder specific countries to increase climate ambitions, while ICIs involvement can be more viable. In parallel to the increasing importance of ICIs, a rise in the actual number of ICIs was seen [Widerberg and Stripple, 2016] (see Figure 2.2).

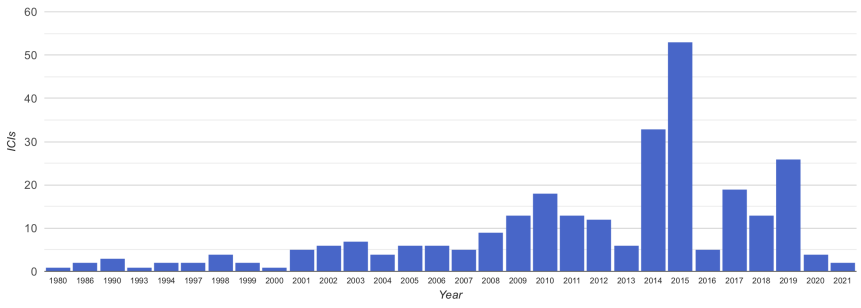

Figure 2.2: Number of initiatives globally launched per year derived from the Climate Initiatives Platform [2022].

With its rise in popularity, multiple studies have been published that addressed the importance of ICIs from critical perspectives. In 2015, an article was published by

Widerberg and Pattberg [2015], who questioned the legitimacy and institutional fit of ICIs despite of the evidently potential effectiveness. Hsu et al. [2018] argued that the voluntary nature of ICIs makes it hard to evaluate the actual contribution corporates make to climate action. Nevertheless, others shed light on the potential of ICIs by proving the level of ambition of ICIs [Lui et al., 2021], arguing that interaction between policymakers and non-state actors with the intention to formulate policies is reflected in several ICIs [Smit and Kuramochi, 2020], concluding that ICIs can serve as the much needed effective incentive [Chan et al., 2018] for direct emission reduction, spurring technological development, and creating momentum for other initiatives and activities [Hsu et al., 2018].

The global ICI landscape thus shows accurate evidence on the high level of ambitions, while actual emission reductions as a result of ICI memberships has received little attention to date in the academic literature [Lui et al., 2021; Ruiz Manuel, 2021]. In addition, progress on implementation of ICIs is considered as largely unknown or slower than expected [Lui et al., 2021]. On the other hand, great progress is noticed in terms of understanding the influential factors of the performance of ICIs, including: tracking targets, effective leadership, permanent secretariat, measurable targets, enhanced monitoring systems, incentives, and regulatory support for the NSAs. The latter can thereby be fulfilled by the role of governments [Hsu et al., 2018], who are also crucial in further leverage and enhancement of cooperation with the ICIs to be able to correct global emissions and accelerate the transition towards net zero [Lui et al., 2021; Harrison, 2014]. Given that ICIs, when performed effectively, can have the potential to form the bridge towards more ambitious climate policy [Widerberg and Pattberg, 2015] and contribute to the global road to net zero, we desperately need initiatives to scale up across sectors and regions to reach the potential emission reduction of 15-23 $GtCO_2$ per year by 2030 [Hsu et al., 2018].

2.5 CHARACTERIZING THE SCIENCE BASED TARGETS INITIATIVE

This research focuses on the most prominent climate initiative in the current ICIs landscape, the SBTi [Blok, 2022; Giesekam et al., 2021]. The SBTi is a joint initiative from the World Wide Fund for Nature (WWF), the World Resources Institute (WRI), the UN Global Compact, and CDP. At the time of writing 1462 companies have set science based targets since 2015, and a steep increase in corporates with both target commitments and approvals can be seen (Figure 2.3) [SBTi, 2022c].

In short, the SBTi encourages corporates to set carbon reduction targets that are in line with the scientific set pathways that have a high probability of restricting global warming to either 2°C or 1.5°C, depending on the target that is committed to by the company, in order to "prevent the worst effects of climate change" [SBTi, 2022a]. The role of the SBTi thereby is to promote emission reduction and target setting that is in line with current climate science, to provide technical assistance and necessary expertise, and to assess and validate targets set by corporates. Whilst exact emission reduction potential of the current committed corporates is unclear, previous studies have shown that most science-based targets are indeed 'on-target' [Giesekam et al., 2021] and that the collective work of these companies have led to substantive climate mitigation, measured in scope 1+2 emissions [Ruiz Manuel, 2021].

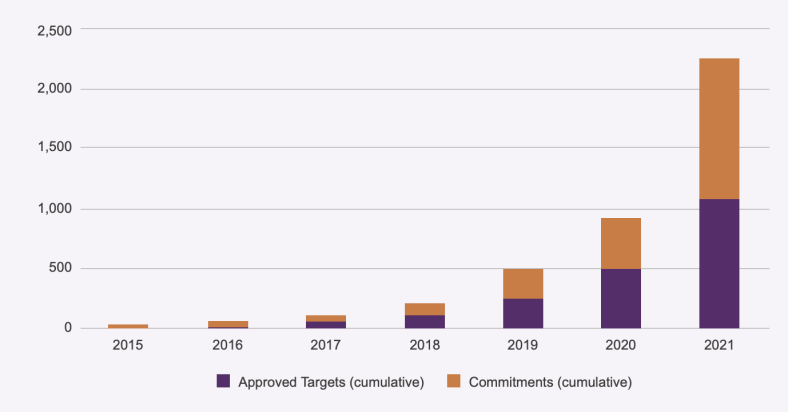

Figure 2.3: Annual cumulative number of corporates with approved targets and commitments between 2015-2021, as derived from SBTi [2022e]. A steep increase in corporates that committed to target setting as well as approved targets can be seen.

2.5.1 The step-wise process to science-based target setting

The validated science-based targets are developed by a step-wise process, as displayed in Figure 2.4, which will be briefly explained.

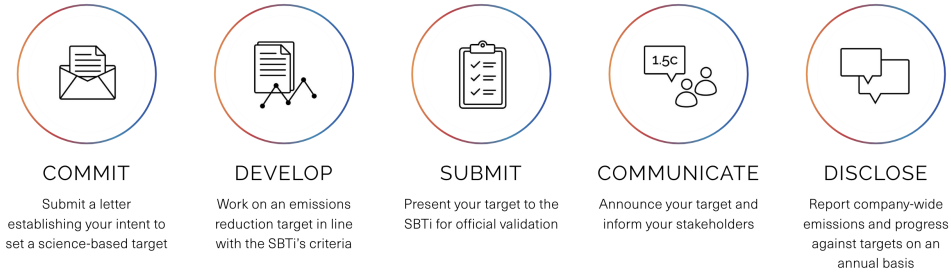

Figure 2.4: The step-by-step process to target setting according to the SBTi, derived from the SBTi official website SBTi [2022d].

First, committing to the target is done online via the SBTi standard commitment letter [SBTi, 2022d]. After which, the corporate has 24 months to set targets and submit them to the SBTi. In the further course of this research, a company that commits to target setting in the SBTi is known as a corporate that participates in the SBTi, or to put it differently, becomes a member of the SBTi. Second, targets should be developed based on certain science-based targets criteria. It is the company which must take the lead in this process, but it is interesting to note that the SBTi offers a plethora of guides, protocols, and target settings tools to begin with developing targets. Interestingly, the time frame that is assessed in this study still allows for corporates developing targets for well-below 2°C targets, while the SBTi will only accept 1.5°C-aligned targets from July 2022. Furthermore, a critical note on this step is made by Giesekam et al. [2021], who argues that comparability of commitments made is limited due target-setting that is not standardized. Third, via a target submission form the target must be submitted, and a validation process by the SBTi must be booked by the corporate [SBTi, 2022d]. Noticeably, target validation is costed within a range of $1,000 to $14,500, depending on the company size, target type, and industry sector. Fourth, stakeholders may be informed after target approval by the SBTi. In general, targets are published by the SBTi one month after approval, and the corporate must make its target public within the six month after approval. The fifth and last step is the task of annual emission disclosure, whereby progress on reaching the validated targets via reports and the company's website is

suggested. However, integration of a reporting requirement rather than suggesting target tracking is recommended, to elevate the commitments to substantive rather than symbolic. This way, the critical role of the SBTi in carbon reduction targets would be further enhanced [Giesekam et al., 2021].

2.5.2 Relevant criteria to join the SBTi

For the committing companies, several requirements for targets have been set by the SBTi, which are formulated in several criteria. It is thereby important to notice that these criteria may change over time and that the criteria that held true at the time of writing will follow. Thereby, all criteria described are based on the official document of the SBTi [2021]. Furthermore, criteria as summarized below are SBTi requirements, whereby recommendations and permissions are not taken into consideration. Relevant criteria briefly include:

- All relevant GHGs as required per the GHG Protocol Corporate Standard must be covered by the targets.
- Targets must cover company-wide scope 1 and scope 2 emissions.
- It is required to include scope 3 emissions in the case that a company's scope 3 emissions are 40% or more of total scope 1, 2, and 3 emissions.
- Companies involved in gas or fossil fuel sales or distribution must include scope 3 emissions.
- One or more targets must be set that collectively cover at least two-thirds of scope 3 emissions by taking into account the minimum boundary of each scope 3 category conforming the GHG Protocol Corporate Value Chain Accounting and Reporting Standard.
- The latest methods and tools must be used for target modelling, in accordance with the SBTi.
- The use of carbon credits must not be counted as emission reductions.
- Targets must cover a minimum of 5 years and a maximum of 10 years.
- Targets must be reviewed every 5 years at a minimum.
- Targets will only be accepted when 1.5°C-aligned.

3 LITERATURE REVIEW ON POTENTIAL MOTIVES AFFECTING CORPORATE SBTI PARTICIPATION

The importance of ICIs within the climate action and international negotiation arena in addition to the role of the SBTi in this field have been clarified in the previous chapter. This chapter will proceed on analyzing the factors that may affect corporates in participating in the SBTi to understand what truly drives voluntary participation in this initiative. As argued in the introductory chapter, these insights may help policymakers in designing policies that are more compatible with corporate incentives, in addition to government and investors in understanding the corporate climate agenda of which the driving forces of becoming a SBTi member are part of. Moreover, insights in determinants could provide guidance for the SBTi and non-participants in their decision to join or not. The goal of the literature review is to provide an overview of the extant literature that discusses factors that may be related to participation in the SBTi, which can be used as guidance for the empirical work in the next research phases. To this end, a thorough narrative literature review to synthesize key factors found in literature on participation in ICIs, voluntary initiatives, and taking corporate climate action in general was performed. These identified key factors allowed for the formulation of ten hypotheses for the quantitative research, each covering specific firm characteristics that might be related to SBTi participation. The ten specific hypotheses to be tested in the quantitative study are presented throughout the literature review, and in general, the overall body of the review provides a stepping stone towards credibility and complementarity to the study findings at a later stage in the research. First, key considerations for conducting the literature review are presented in section 3.1, the Review Approach, to increase clarity and usefulness, after which the literature study is presented.

3.1 REVIEW APPROACH

In constructing the literature review, three central assumptions were made that are based on characteristics of the SBTi. First, the SBTi is one prominent initiative on the list of ICIs. Factors found in literature that represent determinants to generally participate in ICIs are therefore considered as relevant for the purpose of this study, namely to identify why corporates join the SBTi. Second, the SBTi is an initiative with a voluntary nature, implying that a corporate can decide for itself whether it wants to participate in the initiative or not. Therefore, present papers on known factors affecting participation in voluntary initiatives such as social, environmental, and CSR initiatives are also considered relevant in this literature review. Third, the SBTi is categorized as an ICI and thus represents corporate climate action. Therefore, state of the art literature on known factors affecting corporate climate action are furthermore taken into account. For this research it is thereby worth noting that the literature on factors affecting corporate climate action builds upon previous, and parallel, research on factors relating to corporate social responsibility (CSR), sustainable development and performance, and engagement in sustainability as well [Chan et al., 2021; Hale, 2016]. The present work thus narrows in on the factors found in literature that affect corporate ICI and voluntary initiative participation, and climate action as systematized by several scholars.

Further clarification may be necessary in how this research concentrates on the determining factors for corporate participation in the SBTi. While some literature focuses on factors that are relevant to individuals, meaning board members, influential executives or management positions, this research concentrates on factors that are generally relevant for the opportunities and interests of any corporate, not an individual within the organization.

The literature review guide of Siddaway et al. [2019] was followed, meaning in the search for literature the scope of the review was considered by familiarizing with current literature, different terminology was considered, search terms were created, and inclusion and exclusion criteria were looked at. Due to the time constraints of this research project, the scope of the literature search was limited to the initially formulated research questions. Furthermore, it is relevant to note that this research aims to focus on the description of influencing *factors*, that covering potential *drivers, reasons*, and *motives* as referred to in existing literature, which others might distinguish in their work [Okereke, 2007]. Also, it covers *firm characteristics* that might be of influence in the decision to join. In addition, there are also references that can be found in the literature that either refer to *businesses, companies, firms* or *corporations*. In this study, the variety of terminology as highlighted here is also used as input for the search terms. Moreover, the assumptions as described in the previous paragraph are considered in the search for relevant literature. As a result, search terms were combinations of *factors, drivers, reasons, motives or firm characteristics*, with *businesses, companies, firms, corporates or corporations*, with *ICIs, voluntary initiative participation or climate action*. Subsequently, these search terms were further scoped down to *social, environmental, and CSR initiatives* and to *corporate social responsibility, sustainable development and performance, and engagement in sustainability*. In addition to including synonyms, singular and plural forms were used, and abbreviations were replaced with words written in full. That means, both *ICIs* and *International Cooperative Initiatives*, and *CSR* and *Corporate Social Responsibility* were used.

Regarding the inclusion and exclusion of papers for this literature study, several criteria were considered. No limitations for selecting academic papers were set for specific study designs, population, sample size, date range, or geographical boundaries. Meaning, papers were differing in methodology, type of company, sample size, geographic location, and publication date. Exclusion of academic papers in this study was based on language, which means that papers were limited to English writing. In addition, papers that were not specifically focusing on corporates or its synonyms as described above, were excluded. This means that papers that focused on non-state actors such as cities were not considered as relevant. Furthermore and more obvious, papers that did not seem to contribute to answering the research questions according to the researcher were not included.

To develop a robust and reliable summary of current research, the search for literature was conducted by the required minimum number of two electronic databases [Siddaway et al., 2019]. Namely, the Scopus Search engine, Google Scholar, and Google for both relevant publications and gray literature such as corporate reports and working papers. The latter were considered relevant since corporates motives are the central theme of analysis. With regard to academic publications, the searching process was undertaken using the resources available through the TU Delft Library. Furthermore, the visual tool Connected Papers was used to help find connected academic papers relevant to this field of work, that were not explored by initial searches in the databases and search terms as described [Connected Papers, 2022].

3.2 A GUIDING FRAMEWORK ON CORPORATE MOTIVES TO PARTICIPATE IN THE SBTI

As previously stated, the SBTi has received little attention in literature to date, and available references are limited to quantitative assessments. For instance, Ruiz Manuel [2021] researched actual GHG emission reductions of SBTi members by applying Chan et al. [2021]'s conceptual framework to assess the progress, implementation, and impact of non-state climate action; and Lui et al. [2021] quantified potential emission reduction impacts from several ICIs targets, among which the SBTi. Furthermore, Giesekam et al. [2021] discussed the initiative development based on different initiative components by quantitatively assessing the progress of each component. While the approaches and outcomes in these investigations differ, the works have in common that they draw on data from the responses of the Carbon Disclosure Project (CDP), several company annual and sustainability reports, and corporate social responsibility websites; and that they focus on impacts and results of the initiative.

Thus, the literature on the SBTi shows some variety in quantitative assessments on target outcomes and development, but further work in identifying reasons for corporates to participate in this initiative appears relevant [Giesekam et al., 2021]. This paper is therefore pioneering in the sense that it creates a novel, important, and relevant contribution to interesting knowledge. In general, there is an extensive body of literature focusing on the factors affecting corporates towards climate action or voluntary initiative participation which have been explored from a number of perspectives. Some authors reflected on motivations for corporate climate strategies [Okereke, 2007; Yunus et al., 2016]; others for CSR activities [Babiak and Trendafilova, 2011; Graafland and Mazereeuw-Van der Duijn Schouten, 2012] or joining CSR, social or environmental initiatives [Cetindamar, 2007; Lyon and Maxwell, 1999; Brønn and Vidaver-Cohen, 2009]; while another range of literature dove into reasons to implement corporate sustainability development [Windolph et al., 2014; Simões-Coelho and Figueira, 2021], and firm characteristics that are related to sustainability reporting [Wang, 2017a]. In addition, there are references in the literature available that address the reasons of corporates to generally participate in ICIs [Fisher-Vanden and Thorburn, 2011; Jacobs et al., 2010; Lashitew, 2021; Reid and Toffel, 2009]. However, ICIs research was mainly focused on the concept of firm value, and empirical evidence is under debate.

The literature on why corporates involve in climate action thus presented a multitude of concepts in both theoretical and field studies. As a response to a lacking overall picture in the field, Windolph et al. [2014] developed a study that compared empirical findings of a multitude of papers in theoretical studies and published a framework that systematized corporate determinants that contribute to sustainable development. Discussed motives were clustered around the three concepts of Legitimacy, Market Success and Process Improvement. A fourth concept was added by Simões-Coelho and Figueira [2021] and considered Social Insurance, which was derived from the finance literature. In the literature review conducted for this study, a fifth motivation added an angle that did not seem covered by the concepts derived from Windolph et al. [2014] and Simões-Coelho and Figueira [2021] studies, namely Organizational Culture. This concept became one of the most influential but controversial concepts in management and organization studies [Crane, 1995; Jarnagin and Slocum, 2007]. In addition, the belief that an organization's culture affects its sustainability practises gained strength over time and is a recent point of discussion [Howard-Grenville and Gapp, 2022]. Therefore, this fifth concept is considered as a relevant novel addition to the published framework.

Below, an in-depth literature study on why corporates engage in climate action, and participate in ICIs and voluntary initiatives is done based on current empirical studies, which can be used as input framework for the empirical model in the further course of this study. The five identified core concepts serve as a guide to classify and place the factors found in the analyzed field articles. Each section represents a concept, gives a description of the concept, assesses its specific relevance in the framework, and describes its clustered factors, concluding with one or multiple hypotheses for the purpose of quantitative statistical analysis. Finally, the findings are summarized in Table 3.1, which highlights the five concepts used throughout the present work with a description and keywords per concept as derived from the study's literature review.

3.2.1 Legitimacy

Arising from the early management theory, legitimacy is defined as an organization's ambition to have actions that are "desirable, proper, appropriate within some socially constructed system of norms, values, beliefs, and definitions" [Suchman, 1995, p. 574], whereby corporates seek for legitimacy for long-term survival [Rivera et al., 2006]. The concept appears widely studied in multiple literature reviews on corporate sustainability and CSR management, where it is argued that complying with environmental and social regulations and laws is one aspect of achieving legitimacy [Windolph et al., 2014]. In addition, institutional pressures are mentioned in the form of self-regulation, and pressures from actors such as associations, trade unions, investors or other stakeholders let corporates adapt "their practices and discourses to the evolving system of beliefs present in any society" [Simões-Coelho and Figueira, 2021, p. 6].

A clear consensus on legitimacy as motivational factor for corporate climate action was found in this literature review, and some of them will be highlighted. Despite the narrow focus of their literature review, Lyon and Maxwell [1999] considered environmental voluntary initiatives and the factors that may affect corporate willingness and ability to involve in these initiatives. External pressures such as governmental, investor, community, environmental, and industry group pressures were mentioned. In addition, the literature review that was conducted by Okereke [2007] argued that regulation, government directives, and investor pressure are relevant motivations for carbon management activities. Furthermore, regarding the field of CSR, the survey-based study of Cetindamar [2007] shed light on reasons why companies behave environmentally responsible and become a CSR initiative participant. Although the study covered a relative small sample size of 29 companies, legal procedures and pressure of stakeholders were frequently mentioned in an ethical and economic way by the respondents. Another methodology was performed by Petersen et al. [2015]. Interview results revealed that moral and ethical imperative and social licence to operate, in addition to investor pressure, were critical factors for sustainability transitions in businesses. The latter was also found by Fisher-Vanden and Thorburn [2011], revealing that corporates facing climate-related shareholder resolutions are more intended to join voluntary UN's Climate Leaders; and Reid and Toffel [2009], statistically revealing that pressure from shareholder activists may elicit change in corporate practices, such as participating in voluntary initiatives.

Interestingly, the degree of pressures from stakeholders and the urge to fulfill stakeholders expectations seem to differ between industry sectors. The study of Brønn and Vidaver-Cohen [2009] investigated corporate motives to join social initiatives and linked them to industry sectors. Clear evidence was found that legitimacy perceptions differ across sectors, which was confirmed by studies of Haddock-Fraser and Tourelle [2010] and Deloitte [2019]. That means, the former demonstrated that

different industrial sectors show clear variability in environmental reporting activity, and the latter showed that pressure felt from different stakeholders to act on climate change varies across industries according to the 1,200 CFOs that were included as survey respondents. Both studies of Brønn and Vidaver-Cohen [2009] and Deloitte [2019] confirm that a relatively strong relation between legitimacy perceptions and climate action exists amongst survey respondents in the oil sector, perhaps the most 'legitimacy-challenged' sector in the current corporate landscape. With regard to the purpose of this study, these findings lead to the following hypothesis:

H1 *Corporates that operate in the Energy sector are more likely to join the SBTi.*

Now that is highlighted that linkages between legitimate perceptions and climate action are expected to differ across industries, another important distinction can be made regarding the corporate business model. Meaning, the proximity to the final consumer within the corporate supply chain is considered as a relevant factor that influences the corporate environmental proactivity. As an evidence, Haddock-Fraser and Tourelle [2010] find significant statistical proof that companies that focus on end-consumers (B2C) are often more related with environmental activities than businesses that focus on selling goods and services to other businesses which have little consumer contact (B2B). The reason for this is that corporates feel the most pressure from customers and clients to act more sustainable, followed by management, employees, government, civil society, shareholders, competitors, and banks [Deloitte, 2019]. In this line of reasoning exists the research of Lyon and Maxwell [1999], who mention the concept of green consumerism as an incentive for corporate climate action; and the distinction made by Simões-Coelho and Figueira [2021], who argued that clients and consumers are relatively new stakeholders that influence companies' considerations due to their willingness to compete and differentiate. Thereby, motivating them for changes that go beyond the requirements of pressure groups or governments that initially motivated them.

The discussed developments thus show that there is a strong belief that corporates that have established an end-consumer business model, engage in initiatives as part of climate action to create an impression of legitimacy in the minds of clients or consumers. Thereby, the corporate's business model and thereby its stakeholder focus might be of influence in initiative participation. Based on these insights, the following hypothesis can be formulated:

H2 *End-consumer focused corporates (B2C) are more likely to participate in the SBTi than those that are business-focused (B2B).*

3.2.2 Market Success

Market success describes "an increase in turnover, competitiveness, brand equity, or innovation" [Windolph et al., 2014, p. 275]. In light of corporate sustainability management, [Windolph et al., 2014] argue that: "the behavior of consumers, investors, and competitors who can create the motivation to achieve market success through sustainability management" [p.274]. The corporate climate agenda thereby has become a competitive factor in the current corporate landscape. For instance because customers ask for environmental and social aspects related to products and services [Windolph et al., 2014], because a sustainability strategy has become a powerful tool to attract the best talent [Ersoy and Aksehirli, 2015], and because finance has played an increasingly critical role in the climate crisis agenda. The latter was clearly reflected in the 2018 launch of the Investor Agenda and the 2021 COP26 financial alliance for net-zero, both founded to accelerate the net-zero transition [The Investor Agenda, 2022; UNFCCC, 2021]. Furthermore, the perspective of sustainability practices related to competitiveness was also acknowledged by Petersen

et al. [2015] and Brønn and Vidaver-Cohen [2009], who respectively argued for the motivation of having a first-mover advantage when bringing about social change for corporate sustainability, and for remaining competitive as being a relevant influencing factor for joining social initiatives. In this light, it is noticeably believed that achieving competitive advantage depends on corporate reputation and brand equity development, factors that are nowadays influenced by corporates' environmental intentions [Ajour El Zein et al., 2019].

Closely related to corporate climate intentions is innovation [Ajour El Zein et al., 2019]. Namely, competitive global pressures stimulate corporate climate intentions and actions, for which growth through innovation is required. This, in turn, requires innovative power with which the firm is able to allocate their resources to innovative climate actions and emission reduction research [Montresor and Vezzani, 2016]. Montes et al. [2004] thereby argue that firms with greater innovativeness will be more successful in responding to evolving environments and developing new capacities to achieve better performance. In other words, greater innovativeness means that more resources are available within the firm to achieve successful innovation which is required for corporate climate action and thus competitive advantage. In the respect of competitive global pressures as a motive for corporates to perform climate action, the following hypothesis can be formulated:

H3 *Corporates with greater innovativeness are more likely to participate in the SBTi.*

Furthermore, the extant empirical formal literature and popular press as analyzed in Lyon and Maxwell [1999]'s extensive literature study overwhelmingly concluded that the likelihood of firms to undertake voluntary environmental initiatives increases with firm size. Number of sales, number of employees and value of assets were thereby used as proxy for firm size by the different articles under study. Explanations might exist in legitimate reasons of larger firms which are under more pressure to act according to a climate agenda of different stakeholder groups. In addition, larger firms may have better access to capital markets and have more resources to engage in innovative activities. Furthermore, it was found that greater human resources of large firms have a positive effect on environmental actions [Balasubramanian et al., 2021]. This threefold of reasons implies that it is believed that larger firms experience voluntary actions such as participating in voluntary environmental initiatives as less costly and resource intensive. Similar results were found in the field of carbon management, where the research of Dietz et al. [2018] analyzed the database of an initiative led by asset owners and supported by asset managers, and observed that companies with larger market capitalization implement more carbon management practices. Following from the findings presented on market success being a believed motivation for corporates to participate in voluntary initiatives, the fourth hypothesis can be summarized as follows:

H4 *Larger employee corporates are more likely to participate in the SBTi.*

3.2.3 Internal Improvement

Internal improvement relates to delivering cost and resources reduction as a consequence of corporate process and resource use improvements, thus maximizing its efficiency. This can, in turn, lead to more sustainable operations within the firm [Windolph et al., 2014]. In this respect, it is generally believed that most companies recognize that sustainable actions of the firm can have gains in the form of operations-driven cost savings and process efficiencies [Steger et al., 2007]. As an example, Lozano [2015] confirms that a company's internal driver to engage in CSR is improving process efficiencies and waste reduction while decreasing the costs. These process efficiencies as a consequence of sustainable corporate actions range

from purchasing, logistics, and the production department of corporates [Windolph et al., 2014]. To clarify, purchase improvement is described as responsibly purchasing produced materials, using recycled materials, and reducing packaging; all having its effects on the development of a sustainable supply chain. For logistics, on the other hand, efficiency can increase by reducing waste, monitoring emissions, and reusing the resources used. With respect to productions within a firm, sustainable manufacturing and service processes must be established by achieving energy- and material-efficient productions while increasing process and product quality.

In short, corporate internal processes, resources, and efficiency are believed to improve by incorporating both social and environmental considerations in the day-to-day operations and long-term focus, leading to cost and resources reduction for the firm. If considered as strategically important, maximizing efficiency is thus argued to be a potential corporate motivation to take climate action according to extant literature. Based upon the preceding information and the existing believe that corporates recognize the costs and efficiencies gains derived from sustainable actions, it is therefore hypothesized that:

H5 *Corporates that endeavur maximizing efficiency are more likely to participate in the SBTi.*

3.2.4 Social Insurance

Social Insurance was the fourth concept as introduced by Simões-Coelho and Figueira [2021], and evolves around its evident financial self-serving characteristic. While the concept of Legitimacy concerns a positive response to the pressures of stakeholders such as governments, investors, or social forces with the need to be ethically responsible; Social Insurance is described as preventing "potential losses in corporate reputations, protecting shareowners against financial distress that could not be insured in regular financial markets and preserving economic value in addition to goodwill from activities that generate value" [Simões-Coelho and Figueira, 2021, p 7]. Corporate incentives for activities around social responsibility and sustainability should thus go beyond requirements from social groups, regulations, and law, especially when the potential losses become larger.

Furthermore, McKinsey & Company [2018] confirms that "corporate reputations are vulnerable to single events, as risks once thought to have a limited probability of occurrence are actually materializing" [p. 2]. Therefore, arising from the insurance theory, corporate investments should help for mitigation of risky event involvement and facing crises. In this line of reasoning, multiple authors mention reasons within to the social insurance concept that relate to why a corporate participates in a voluntary initiative. Okereke [2007] mentions it can help guiding against risk; Petersen et al. [2015] argue for potential risk mitigation in the fields of regulatory risk, supply chain risk, and brand risk; and Brønn and Vidaver-Cohen [2009] highlight strengthening corporate reputation and helping reduce corporate risk as relevant factors for initiative participation. Therefore, in this research, the belief exists that:

H6 *Corporates that endeavor the prevention of reputational and financial losses are more likely to participate in the SBTi.*

3.2.5 Organizational Culture

Finally, Organizational Culture is a mean of stimulating corporate climate action, whereby cultural change and transformation within an organization is needed to re-

spond to environmental and social challenges. The central idea is that a sustainability-oriented culture is needed to move towards sustainability within the firm [Linnenluecke and Griffiths, 2010]. The concept of organizational culture has become popular within management and organization studies, but is also rising in importance within the sustainability literature. Multiple studies have acknowledged the importance of culture in corporate sustainability success. Based on a systemic literature review, Isensee et al. [2020] suggest that a strong sustainability performance is linked to a specific organizational culture. Furthermore, Abbett et al. [2010] argue culture matters in the success of corporate sustainability after conducting a survey. In addition, Abbett et al. [2010] shed light on relevant literature that points to organizational culture being an important driver behind the success of implemented sustainability initiatives within a firm. Despite the fact that corporate culture is analyzed from several perspectives and that the concept is operationalized differently, key dimensions identified in the assessed literature give an overall picture of corporate culture and include assumptions, attitudes, (ethical) behavior, beliefs, knowledge, leadership, management, meanings, mission and vision, norms, organizational capabilities, perspective, rules, strategy, symbols, and values.

Existing theories and models of corporate culture frequently argued that top management plays an important role in the sustainability culture of a corporate [Linnenluecke and Griffiths, 2010; Zammuto et al., 2000]. This means that it is believed that promotion of sustainability values and principles by top management will be widely shared and held within all layers of the organization. In line with this reasoning exists the research of Eccles et al. [2012], that explores five dimensions that determine culture differences between corporates by performing a statistical model. For one of the dimensions, *structure*, they find that firms which voluntarily adopted sustainability policies, identified as high sustainability firms, assign responsibility for sustainability to the board of directors. Thereby, the creation of governance bodies such as a sustainability or CSR committee is more common amongst the high sustainability firms. In line with this reasoning, the following hypothesis can be formulated:

H7 *Corporates with a stand-alone sustainability committee are more likely to participate in the SBTi.*

Furthermore, Eccles et al. [2012] mention *executive compensation* as relevant dimension. The results indicate that high sustainability firms often include sustainability metrics in their top management compensation performance metrics. The reason for this was expressed by [Ikram et al., 2019], and included the mitigation of agency problems in addition to providing a signal to stakeholders and shareholders that the firm is committed to their targets. In general, a discussion exist on CEO compensation as incentive to act and operate sustainably [Eccles et al., 2012; Francoeur et al., 2017]. On the one hand, Francoeur et al. [2017] highlights research where firms reward their top management according to good environmental performance. In addition, Eccles et al. [2012] finds that executives should be compensated to increase their motivation to reach sustainability targets. On the other hand, Francoeur et al. [2017] shows outcomes that argued environment friendly companies rely less on incentive-based compensation than firms that do not care about the environment. The latter was argued from the stewardship theory, implying that managers will act responsible and be motivated even when operating by their own. The study of Francoeur et al. [2017] focuses on OLS regression models that includes 700 international big companies. Therefore, its outcomes are considered as reliable for this study. Based on the research findings, the following is hypothesized:

H8a *Corporates with relative high incentive-based compensation are more likely to participate in the SBTi.*

H8b *Corporates with relative high incentive-based compensation are less likely to participate in the SBTi.*

Furthermore, Linnenluecke and Griffiths [2010] argue that different corporate perspectives of corporate culture exists. On the one hand, the integration perspective implies that organizations only have one unified culture with an organization-wide consensus on assumptions, values, and beliefs. On the other hand, the differentiation perspective, stating that multiple sub-groups exist throughout the organization among different entities or groups, and that different attitudes towards sustainability exist. Where the former is consistent with the belief that the promotion of sustainability values and principles by top management are widely shared and held within the whole organization, the latter allows for different visions to exists within the firm. While sub-groups can form around hierarchical levels, organizational roles or personal contacts and networks, demographic differences such as ethnicity and gender also play an important role. The latter two are thereby considered as the most sensitive topics in organization governance which are still in their infancy [Zaid et al., 2020]. The literature reviews of Zaid et al. [2020] and Konadu et al. [2022] reveal that current literature provides tremendous studies on diversity in corporate boards related to sustainability performance, but consensus on findings is lacking. However, studies differ in scope, methodology and strength of the analysis process. To give an idea, the study of Staniškienė and Stankevičiūtė [2018] only focused on the social aspects of sustainability while excluding environmental effects; Khan et al. [2019] and Konadu et al. [2022] limited themselves to only one measure of board diversity in their regression analysis; and Bear et al. [2010], Ben-Amar et al. [2017], and Konadu et al. [2022] only focused on the effect of board diversity on climate change disclosure being just a part of corporate sustainability principles [Linnenluecke and Griffiths, 2010].

An outstanding study was that of Zaid et al. [2020] who explored social, environmental, and economic factors as the three core dimensions of corporate sustainable development; adopted multiple most common dimensions of board diversity; and discussed corporate sustainability performance related to both boardroom nationality and gender diversity, in line with the potential sources of sub-group formation within an organization of Linnenluecke and Griffiths [2010] as previously mentioned. The relatively broad and deep capturing of board diversity related to corporate sustainability performance in Zaid et al. [2020]'s research improves the strength of the analysis process and thereby the reliability of its outcome. First, they surprisingly believed that gender diversity does not greatly affect the performance of corporates with regard to sustainability practices. However, their foremost conclusion described that gender diversity within the board can effectively affect the corporate decision making process including its CSR agenda. This was also previously believed by Ruigrok et al. [2007], who argued that women have pervasive influence on the decision-making processes towards corporate performance. Second, Zaid et al. [2020] concluded that boards with foreign members can have a significant positive influence on corporate sustainable performances if foreigners have different cultures, languages, and behavior. This is in line with previous knowledge of others, who argued for positive influence of multinational board members diversity on ideas and perspectives creation, which consequently improves decision-making, action taking, and sustainable firm performance [Ferrero-Ferrero et al., 2015; Ruigrok et al., 2007; Fuente et al., 2017]. In light of the above arguments and following the aforementioned theories, it is hypothesized that:

H9 *Corporates with gender diverse boards are more likely to participate in the SBTi.*

H10 *Corporates with multinational diverse boards are more likely to participate in the SBTi.*

The table below is both a summary of the literature review conducted for this study, as a practical overview of key dimensions as used in extant research. As a result of the existing literature on this subject, three concepts were described by Windolph et al. [2014]. A fourth cluster was added by Simões-Coelho and Figueira [2021], arising from finance literature. The fifth concept was brought from management and organization literature, but includes a subject that is rising in importance within the sustainability literature. The latter links the concept to sustainability success, and is thus considered as relevant for the current study.

Table 3.1: Five concepts that reflect potential motives for corporates to take climate action as used throughout the present work, with a description for each concept, and the keywords that are connected to each concept. The keywords of the first four concepts are derived from the work of Simões-Coelho and Figueira [2021], and keywords for Organization Culture from the assessed literature as highlighted in this review.

Concept	Description	Keywords
Legitimacy	A corporate's ambition to have actions that are accepted and appropriate within a social system consisting of norms, values, beliefs, and definitions.	Legitimate, law, norm, rule, institutional, compliance, accepted, societal values, societal beliefs
Market Success	A corporate's willingness to increase corporate turnover, competitiveness, brand equity or innovation as a consequence of consumer, investors, and competitors behavior in the field.	Competition, competitors, market, brand, sales, turnover, innovation, differentiation
Internal improvement	A corporate's aim for process and resource use improvements that lead to increasing efficiency in the form of reducing costs and resources.	Resource, process, optimization, improvement, enhancement, reduction
Social Insurance	A corporate's goal to gain insurance by mitigating risks to protect the corporate from potential reputation losses, or shareholders from financial distress.	Insurance, goodwill, reputation, preempt, anticipate, prevent
Organizational Culture	A corporate's cultural change and transformation as a mean of stimulating corporate climate action from within the firm.	Assumptions, attitudes, (ethical) behavior, organizational beliefs, knowledge, leadership, management, meanings, mission and vision, norms, organizational capabilities, perspective, rules, strategy, symbols, and organizational values

3.2.6 Overview of the literature review

In Chapter 3, we highlighted factors that were found in literature on corporate climate action, ICI participation, and voluntary initiative participation; thereby assessing the three central assumptions that were based on the characteristics of the SBTi. Furthermore, assessing the first sub-question of this thesis work:

"Why are corporates involved in climate action, ICIs and voluntary initiative participation according to previous research?"

To structure the multitude of concepts that were found in both theoretical and field studies, the framework on corporate sustainable development of Simões-Coelho and Figueira [2021] was used as a basis for shaping the further course of the research. However, the existing framework was extended by adding another angle that covered factors related to the organizational culture of corporates. Thereby, adding a fifth concept that was considered to be one of the most influential but controversial concepts in management and organization studies. The landscape of determinants derived from literature thereby revolved around five concepts: *Legitimacy*, *Market Success*, *Internal Improvement*, *Social Insurance*, and *Organizational*

Culture (Table 3.1); each covering multiple individual factors that could affect a corporate's participation in climate action, ICIs, or voluntary initiatives in general, and expectedly covering the reasons why corporates participate in the SBTi.

4 METHODOLOGY AND METHODS

The mixed-method [Creswell, 2014] approach was used to address the series of empirical research questions, in particular SQ2 and SQ3. After conducting the literature and desk research, the guiding framework as presented in the previous chapter could be used to formulate hypotheses for the quantitative research, and structure the findings according to the five core concepts. The factors as categorized within each core concept cover a range of potential motives, reasons, drivers, and firm characteristics that potentially influence corporates in their decision to join the SBTi. With the aim to answer the main research question, the study's objective is to formulate a good overall picture of determinants for SBTi participation within the study's time period. To this end, it is chosen to apply the mixed-method approach which assesses the main question in two ways. An overview of the research design is shown in Figure 4.1.

On the one hand, the quantitative study investigates whether associations between factors related to firm characteristics and SBTi participation exist. Mainly due to the relatively small sample size of the qualitative study, these relationships could not be accurately assessed with the semi-structured interviews. Moreover, the objectivity of the concrete numbers that are involved in quantitative analysis and which allow for more accurate findings on firm characteristics cannot be achieved by qualitative research, when looking at its subjective nature. On the other hand, the qualitative study assesses potential other factors such as motives, reasons, and drivers that cover the needs and desires of a corporate that could cause the firm to join the SBTi. Although the quantitative results provided input for the semi-structured interviews, assessing causation requires detailed information which could not be obtained through quantitative analysis. Also, quantitative data is often difficult to collect for these types of factors, and statistical analysis might not be applicable due to data that cannot be counted or measured. The two research methods thus complement each other by assessing different types of factors that could be determining in whether a corporate participates in the SBTi or not. Meaning, the qualitative findings are complementary to the quantitative findings, and vice versa.

Furthermore, the research design allowed for more credible and generalizable results. By the former we mean that the qualitative study could add a richer detail to the quantitative findings by providing explanations for these results. Thereby, different methods of data collection on the same subject, also known as triangulation, increases the credibility of the results. This means that the validity of conclusions are strengthened by findings that corroborate. The latter implies that the relatively small sample size of the qualitative research is enhanced by the larger sample size of the quantitative research. The details of both the quantitative and qualitative methods including data sampling, data collection, variables measurements, and model specifications will follow, respectively, in the further course of this section.

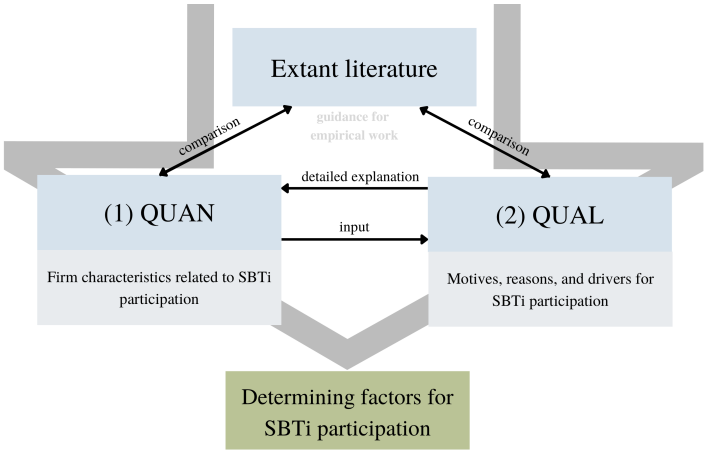

Figure 4.1: Overview of the mixed-method approach as was used in this study. The quantitative analysis entailed econometric statistical analysis, and was sequentially followed by the qualitative study that entailed semi-structured interviews.

4.1 QUANTITATIVE METHOD

4.1.1 Sample and data collection

Sample description

This study analyses the Fortune 500 firms as of 2015, the year which marks the start of the SBTi. To provide comparability in the sample over time and to be able to control for observable and unobservable predictors, data on this sample is collected for the years 2015, 2016, 2017, 2018, 2019, 2020, and 2021, for which the most recent data at the time of writing could be collected for the analysis. The longitudinal data can thereby provide within analysis of the same corporates measuring several points in time. Firms in the Fortune 500 as of 2015 constitute the initial set of corporates. The Fortune 500 is an annual list which is published by Fortune magazine that ranks 500 of the largest U.S. corporates based on their total revenue for respective fiscal years [Fortune 500, 2021]. This group was selected to ensure that corporates with publicly available information are well represented. Corporates with less than six-year time-series data on all variables are excluded. Possible mergers, acquisitions or name changes can thereby be a source of attrition. Furthermore, the universe of Fortune 500 corporates consists of privately held companies as well as public companies. However, privately held companies were excluded from the dataset and computations below, thus considered as another source of attrition, since data on those companies was finite or not available at all. This constraint is imposed to provide comparability in the sample over time. Furthermore, for the empirical analysis, the sample is further restricted based on the following criteria:

- Information on advertisement intensity, intangible assets, number of employees, and sector information are available for the specific corporate in COMPUSTAT.
- Information on board composition, committees, and CEO compensation are available for the specific corporate in BoardEx.

These restrictions impose a survivorship bias on the sample, but is needed to capture sufficient data on the independent variables as used in the model. The above criteria resulted in a unbalanced final panel dataset of 805 observations by 138 corporates, as is visualized in the flowchart of Figure 4.1. Table 4.2 further elaborates on the third step of the flowchart. Meaning, the number of missing observations per

variable and the corresponding percentage of the sample used, which is the sample after dropping firms with less than six years of data, are indicated. It is thereby important to note that overlapping missing observations lead to the final sample of 805 observations.

Table 4.1: Flowchart of the subsequent steps leading to the final data sample. N indicates the number of observations, and the number of remaining firms in the sample is indicated between brackets. (a) refers to the observations dropped from analysis as a consequence of missing data per variable as is further elaborated in Table 4.2.

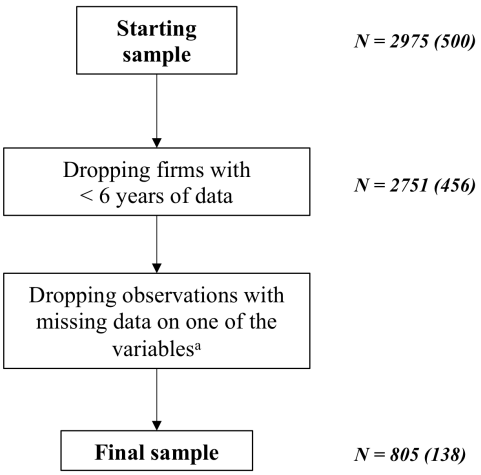

Table 4.2: The number of missing observations per variable and the corresponding percentage of the sample used, which is the sample after dropping firms with less than six years of data. Overlapping missing observations lead to the final sample of 805 observations.

Variable name		
	Number of missing observations	*Percentage of sample used*
GIC	100	3.6%
AdvInt	1627	59.1%
IntangibleAssetsRatio	105	3.8%
Employees	131	4.8%
LeanSix	0	0%
RiskCommittee	200	7.3%
SustainabilityCommittee	199	7.2%
IncentiveBasedComp	913	33.2%
GenderRatio	217	7.9%
NationalityMix	258	9.4%

Furthermore, to alleviate the impact of extreme outliers in the sample, the independent variables for incentive-based CEO compensation and advertising intensity are winsorized at the 2nd and 98th percentiles. This is done by assigning the incentive-based compensation and advertising intensity of the 2nd percentile to observations with the values less than that value, and by assigning the incentive-based compensation and advertising intensity of the 98th percentile to the values above that value.

Thereby, the values for skewness and kurtosis between -2 to +2 and -7 to +7, are respectively taken into account to consider the data to be normal [Hair et al., 2010].

Data collection

The data used in this quantitative research came from the following sources: COMPUSTAT for financial and accounting measures, and sector data; BoardEx for committee details, compensation variables and organization data; and the website of the International Lean Six Sigma Institute for certification data. Both COMPUSTAT and BoardEx are research databases available through WRDS. The datasets include corporates ranked in the Fortune 500 as of the year 2015 for the years 2015-2021. The list of Fortune 500 corporates in 2015 was collected from Fortune's website [Fortune 500, 2015]. Furthermore, data on SBTi membership per corporate was extracted from the SBTi website [Science Based Targets initiative, 2022]. This database also indicated the year of becoming a SBTi member per firm. While becoming a SBTi member was possible from 2015, commitment dates start from 2016 and are tracked until 2021 in this sample. Nevertheless, one should keep in mind that memberships can also be entered into after 2021. Therefore, censorship is present in this data.

Data description

To provide an initial overview of the data that is used in the further course of the quantitative analysis in this research, Table 4.3 shows the distribution of the number of membership establishments over the years. Clearly, more corporates in the sample joined the SBTi in 2020 and 2021 than in the preceding years.

Table 4.3: Number of corporates in the sample that established a SBTi membership per year.

2015	2016	2017	2018	2019	2020	2021
0	2	1	8	8	15	16

In order to have a better comprehension of SBTi membership, a sector classification is used to further group the data. Table 4.4 provides an overview of the number of corporates in the sample that established a SBTi membership in a specific year, grouped per sector. The right column *Sample total* adds information on the total number of corporates in the sample that belongs to a certain sector, including both members as non-members of the SBTi. This column allows for the percentage between brackets in the *Total SBTi members* column, which indicates the number of SBTi members as a percentage of the total number of distinct corporates in that specific sector. From the results, it can be seen that 138 distinct corporates exist in the sample, and that 50 distinct corporates in the sample set have become a SBTi member within the time period of 2015-2021. If we compare this with the overall sample of 500 companies, we found that 131 companies in the Fortune 500 of 2015 became a SBTi member between 2015-2021. Furthermore, Consumer Discretionary and Consumer Staples are the biggest sectors in this sample, of which 33% and 86% are SBTi members, respectively. The sectors Health Care and Information Technology have less corporates per sector, however, both sectors show that half of the corporates in the sample are SBTi member. On the other hand, the sectors Energy, Materials, and Financials did not show any established memberships within the study period, and Real Estate only had one corporate in the sample that turned out to be a member.

With respect to the hypothesized determinants of SBTi participation, the following patterns of SBTi members and non-members are shown for the complete dataset (N = 805) in Figure 4.2, showing medians of the continuous variables, and 4.3, showing count of records (observations) of the categorical variables. To clarify, in all

Table 4.4: Number of corporates in the sample that established a SBTi membership per sector in a specific year. The total number of distinct corporates that is SBTi member is shown per sector in the column *Total SBTi members*, and the total number of corporates in the sample that belongs to a certain sector is shown in the column *Sample total*. The percentage in brackets indicates the number of SBTi members as a percentage of the total number of distinct corporates in that specific sector.

	2015	2016	2017	2018	2019	2020	2021	Total SBTi members	Sample total
Energy	0	0	0	0	0	0	0	0 *(0%)*	1
Materials	0	0	0	0	0	0	0	0 *(0%)*	2
Industrials	0	0	0	1	0	0	1	2 *(17%)*	12
Consumer Discretionary	0	0	0	1	5	6	4	16 *(33%)*	48
Consumer Staples	0	1	0	3	1	5	5	15 *(86%)*	22
Health Care	0	0	0	2	0	1	4	7 *(50%)*	14
Financials	0	0	0	0	0	0	0	0 *(0%)*	13
Information Technology	0	1	1	1	2	1	2	8 *(53%)*	15
Communication Services	0	0	0	0	0	1	0	1 *(10%)*	10
Real Estate	0	0	0	0	0	1	0	1 *(100%)*	1
								50	**138**

the charts below the SBTi members refer to the green lines or bars, while the non-members refer to the red lines or bars.

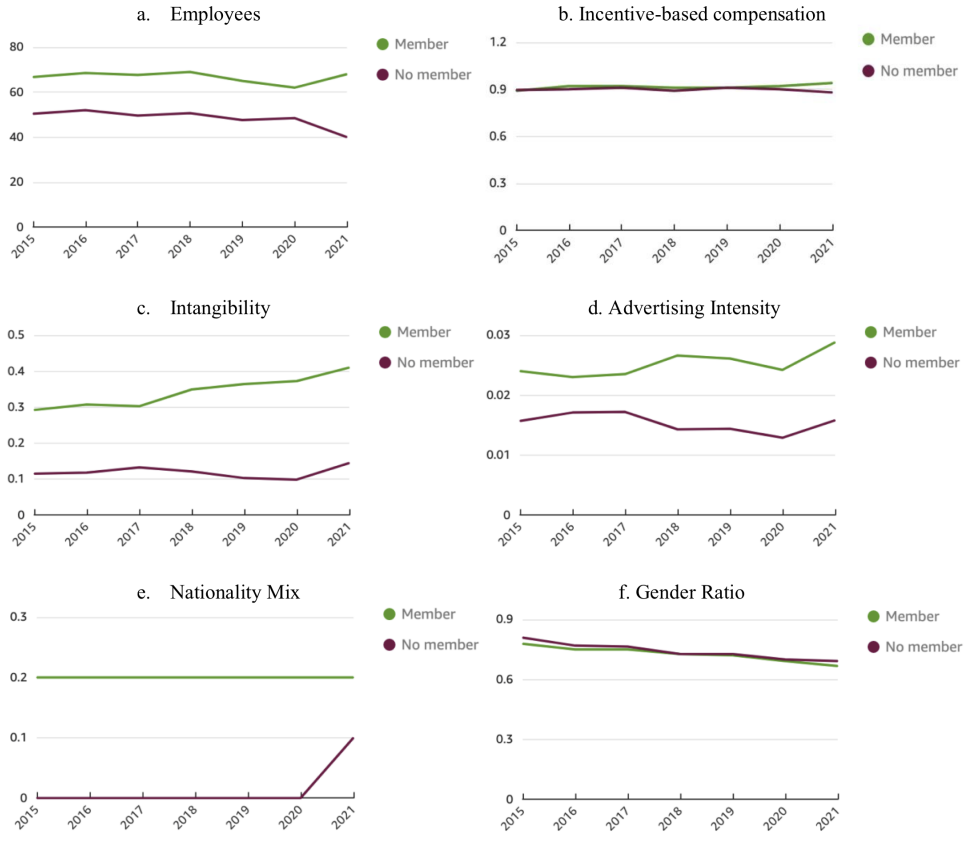

Figure 4.2: Data overview 2015-2021: All continuous (median)

In general those firms that are SBTi member show a larger company size, higher intangibility, higher advertising intensity, and higher nationality mix in the board. No obvious difference is shown in incentive-based compensation and gender ratio. With regard to the Sigma Lean Six certificate, members are slightly more often certified with Sigma Lean Six compared to non-members. On the other hand, a smaller percentage of members in the sample have risk committees and sustainability com-

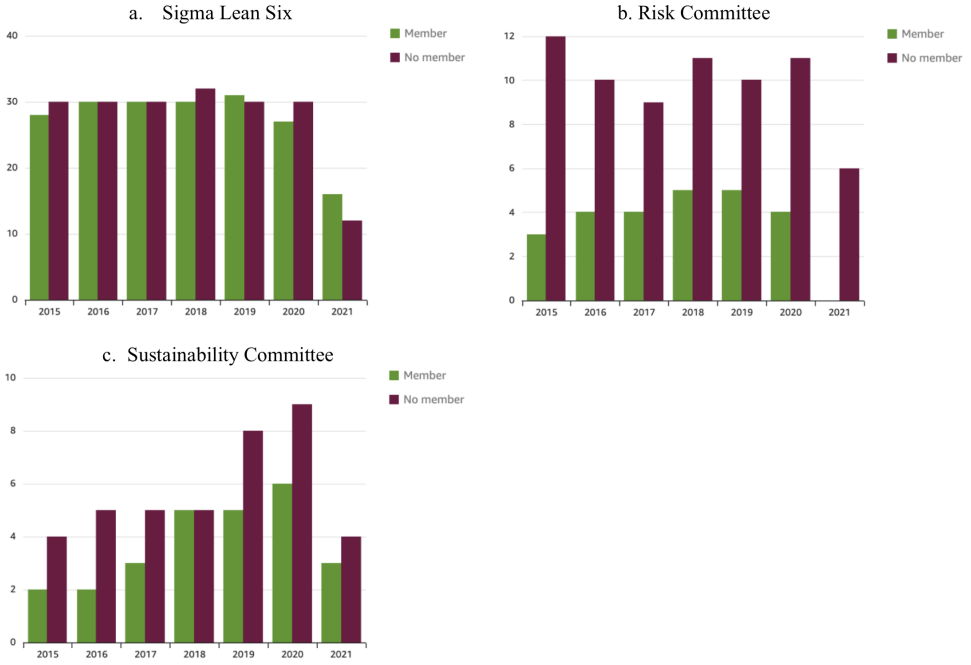

Figure 4.3: Data overview 2015-2021: All categorical variables (count of records). The diagrams indicate the number of observations out of the total number of observations (N = 805) where the possession of a Sigma Lean Six certificate (a), the presence of a risk committee (b), or the presence of a sustainability committee (c) occurs. This is indicated for both members as non-members per year. In other words and as an example, in the year 2015, only two corporates that were SBTi member in the period between 2015-2021 had a sustainability committee, and 4 corporates had a sustainability committee in that year which had not become a member in the same period.

mittees compared to the percentage of non-members that have established these committees in the firm.

4.1.2 Variables measurements

Dependent variable

SBTi membership is presented in this study as the dependent variable. It indicates whether and when a corporate established a membership at the SBTi, including corporates that committed to the initiative what precedes setting a target. In the model, the dichotomous variable *Membership* has been created as the dependent variable using data from the SBTi website as indicated above. This variable takes the value 1 if the corporate particpates in the SBTi and 0 otherwise.

A total of 11 explanatory variables are included in the model. For a better understanding, these variables have been grouped into five subsections according to the concepts defined in Section 3.2. Table 4.5 summarizes the meaning of the variables, and includes the expected direction of each variable by following the hypothesis that were formulated.

Independent variables

Legitimacy

Sector. First, sector participation of each corporate is checked using the sector variables that indicate in which sector the corporate is classified. Data was collected

from the COMPUSTAT North America database, and includes the industry taxonomy of the Global Industry Classification Standard (GICS). According to GICS, all public corporates are categorized within 11 different sectors [S&P Global, 2018]. Dummy variables were employed to assess the effects of each specific sector. An overview of the meaning of each sector is given in Appendix A.

Advertising Intensity. In accordance with Arora and Cason [1996], the degree of corporate consumer contact is proxied with advertising expenditures and normalized with total sales. Data from 2015-2021 were collected from the COMPUSTAT North America database, to compute the *Advertising Intensity* as was also done by Taylor et al. [2018]. To this end, firm's sales (SALE) are divided by advertising expenditures (XAD). This variable is used as an indicator to show whether end-consumer focused corporates are related to potential SBTi membership.

Market Success

Intangibility. Montresor and Vezzani [2016] argue that intangible assets are major tools for corporates to build innovativeness. Therefore, as a proxy for a firm's innovativeness, the *Intangible Asset Ratio* is used. While R&D expenditures are often labeled as an indicator for corporate innovation and competitive advantage [Heij et al., 2020], innovation results from various other assets which go beyond R&D expenditures, such as human capital, intellectual property products, and software [Strategy&, 2018; OECD, 2010]. Therefore, one could argue that relating R&D to innovation is too limited. In this light, Montresor and Vezzani [2016] argues R&D is more a measurement of innovation input, while intangible assets on a corporate balances sheet represents the firm's actual innovativeness. In other words, a firm's investment decision in intangible assets acquires knowledge assets that consequently increase their innovativeness. That meaning, more resources are available to achieve innovation in the firm. For these reasons, and due to better data availability for the sample in COMPUSTAT for intangible assets than for R&D expenditures, in this research the *Intangible Asset Ratio* is chosen as a proxy for innovativeness. The ratio was calculated by dividing total intangible assets (INTAN) by total assets (AT), which is more commonly used in previous papers, as in that of Zhang [2017] and Ajour El Zein et al. [2019]. In this research, the development of this variable has been carried out from the data as provided by the COMPUSTAT North America database.

Employees. As previously mentioned, firm size is measured differently by different authors [Lyon and Maxwell, 1999]. In this research, company size is measured as the number of employees (EMP) in the firm in thousands, whereby data was extracted from the COMPUSTAT North America database. The reason for measuring number of employees can be logically explained as follows. First, employees are required to facilitate the implementation and guidance of the SBTi within the firm due to the implementation process that requires manpower. Second, given that joining the initiative is relatively inexpensive for a Fortune 500 corporate, manpower is believed to be a better measure of size than, for instance, turnover. Furthermore, employees as a measure of firm's size is also used in similar work of Taylor et al. [2018], who investigated the relation between larger firms and the likeliness to join the voluntarily EPA 33/50 program. In the current study, employees are measured with the natural logarithm because the number of employees was highly skewed to the right.

Internal Improvement

Lean Six Sigma Certificate. To the author's knowledge, the use of variables related to corporates that value internal improvement is not usual. While it is expected that corporates might express values on optimization on their websites or annual corporate proxy statements, this data is difficult or highly time consuming to obtain for a large list of companies. In this research it is therefore chosen to use the voluntary

Lean Sigma Six management implementation as a proxy for a corporate endeavouring maximizing efficiency. According to Jenica et al. [2010], Lean Six Sigma can be a management approach for organizations that are focused on quality and continuous process improvement. In other words, it can be used as a motivational tool for process improvement [Jenica et al., 2010], and productivity [de Carvalho et al., 2014]. The variable *Lean Six Sigma Implementation* takes the value 1 for all years if the corporate possesses a Six Sigma Certification via the International Six Sigma Institute, the most popular Six Sigma certification program. The variable takes 0 otherwise. Data was extracted on the detailed client list as provided on the website of Six Sigma Institute [2022].

Social Insurance

Risk Committee. In addition, the *Risk Committee* variable is included, and used as a proxy for corporates that endeavour the prevention of reputational and financial losses. Risk committee as proxy for risk governance has been used in previously published studies [Sheedy and Griffin, 2018], where it indicated whether a corporate has a separate risk committee or not. The assumption that is made here is that a stand-alone risk committee that is implemented in the corporate establishes more effective corporate risk oversight in the company, in order to mitigate reputational and financial risks. The implementation of such a committee thereby indicates that the corporate endeavours preventing harmful reputational and financial losses, compared to corporates without a stand-alone risk committee that do not particularly put extra effort in such loss prevention. In addition, a risk committee manages the corporate's risk profile effectively, and sufficient expertise is present in the committee. In this study, data is used from the BoardEx North America database, whereby committee names (CommitteeName) that include *Risk* are considered as stand-alone risk committees. A dummy variable is used which takes the value of 1 when a stand-alone risk committee exists in a certain year and 0 otherwise. Nevertheless, BoardEx identified committees with names combining *Risk* with *Audit* were excluded, since Audit committees are required for listed publicly traded companies [Fichtner, 2010]. Therefore, Audit combined committees are not considered as relevant indicator in this thesis.

Organizational Culture

Sustainability Committee. The first variable highlighted for Organizational Culture is the presence of a separate subcommittee of the board that focuses on sustainability related strategies and practices. The presence of such a committee indicates whether the firm is engaged in environmental sustainability [Muhammad and Migliori, 2022]. Data is derived from the BoardEx North America database. Following recent research of Fu et al. [2020], committee names (CommitteeName) that include *Sustainability, Sustainable, Responsibility, Ethics* or *Environment* are considered as stand-alone sustainability related committees. A dummy variable is used which takes the value of 1 when a stand-alone sustainability related committee exists in a certain year and 0 otherwise.

Incentive-based Compensation. Included is the *Incentive Based Compensation* variable which is measured as the ratio between the equity-based compensation and CEO total compensation in accordance with the variable used in the work of Francoeur et al. [2017]. This ratio is expressed by the BoardEx North America database as Equity Linked Remuneration ratio (EqLinkRemRatio). However, BoardEx provides data for all individual board members and to test the hypothesis, only CEO data is considered as relevant. Therefore, BoardEx variable Director type (NED) was used to filter the data to executive positions. Consequently, in line with the definition of [Ruf and Schmider, 2018], the executive director with the highest total compensation is considered as the CEO of the company. Therefore, the BoardEx variable Total Direct Compensation is used to select all CEOs in this research' sam-

ple.

Board Gender Diversity. Furthermore, following prior research on board gender diversity [Owen and Temesvary, 2018; Delis et al., 2017], *Board Gender Diversity* is included. This variable is expressed by BoardEx variable Gender Ratio (GenderRatio), which indicates the proportion of male directors at the annual report date that is selected, ranging from 0 to 1. This resulted in gender ratios per corporate for the period of 2015-2021.

Board Multinational Diversity. Finally included is the variable *Board Multinational Diversity*, represented by BoardEx variable Nationality Mix (NationalityMix). This index variable ranges from 0 to 1 to approach the share of non-national directors presented in the board. This variable is commonly used in existing research on board nationality diversity, such as that of Bleijenberg [2019] and Yang et al. [2019].

Table 4.5: Variable definitions, including expected directions and associated hypotheses (H1-H10).

Variable	Code	Definitions	Expected Direction
SBTi membership	*Membership*	Firms that established a SBTi membership were assigned 1 for the year of the establishment and the years that followed; firms that did not establish SBTi membership during the sample period were assigned 0 for that year.	
H1 Corporates that operate in the Energy sector are more likely to join the SBTi.			
Sector	*Sector name [GIC_n]*	Dummy variables that assess the effects of each specific sector, according to the 11 sectors as formulated by GICS.	
H2 End-consumer focused corporates (B2C) are more likely to participate in the SBTi than those that are business-focused (B2B).			
Advertising Intensity	*AdvInt*	Winsorized at the 2nd and 98th percentiles, advertising intensity represents the level of corporate consumer-contact. To determine the intensity, a firm's sales are divided by advertising expenditures.	+
H3 Corporates with greater innovativeness are more likely to participate in the SBTi.			
Intangibility	*IntangibleAssetsRatio*	Used as a proxy for a firm's innovativeness, the Intangible Assets Ratio is calculated by dividing total intangible assets (INTAN) by total assets (AT).	+
H4 Larger employee corporates are more likely to participate in the SBTi.			
Company Size	*Employees*	Company size represented as the number of employees in the firm, measured with the natural logarithm.	+
H5 Corporates that endeavour maximizing efficiency are more likely to participate in the SBTi.			
Possession of the Sigma Lean Six Certificate	*LeanSix*	Used as a proxy for a corporate's interest in internal improvement, the dummy variable LeanSix takes the value 1 if the corporate possesses a Sigma Lean Six Certification, and 0 otherwise.	+
H6 Corporates that endeavour the prevention of reputational and financial losses are more likely to participate in the SBTi.			
Risk Committee	*RiskCommittee*	Dummy variable that takes the value 1 if the corporate has a stand-alone risk committee in a specific year, and 0 otherwise.	+
H7 Corporates with a stand-alone sustainability committee are more likely to participate in the SBTi.			
Sustainability Committee	*SustainabilityCommittee*	Dummy variable takes the value 1 if the corporate has a stand-alone sustainability committee in a specific year, and 0 otherwise.	+
H8a Corporates with relative high incentive-based compensation are more likely to participate in the SBTi. **H8b** Corporates with relative high incentive-based compensation are less likely to participate in the SBTi.			
Incentive-based Compensation	*IncentiveBasedComp*	Winsorized at the 2nd and 98th percentiles, IncentiveBasedComp measures the ratio between the equity-based compensation and CEO total compensation.	+
H9 Corporates with gender diverse boards are more likely to participate in the SBTi.			
Board Gender Diversity	*GenderRatio*	GenderRatio indicates the proportion of male directors at the annual report date that is selected, ranging from 0 to 1.	-
H10 Corporates with multinational diverse boards are more likely to participate in the SBTi.			
Board Multinational Diversity	*NationalityMix*	NationalityMix ranges from 0 to 1 to approach the share of non-national directors presented in the board at the annual report date that is selected.	+

4.2 MODEL SPECIFICATIONS

This section focuses on the empirical study that is based on OLS and Logistic models, and elaborates on each model specification that was used. To summarize, the determinants of corporate SBTi participation are documented using OLS regression for all firms in the sample over the entire period, and by taking sector-specific effects into account in the first main model. For the second main model, time fixed effects are additionally incorporated by including dummies for the years 2015-2020, with 2021 as the reference year, as is suggested by [Lu and White, 2014]. Then,

another OLS estimation is performed by incorporating firm fixed effects, and additionally time fixed effects, to account for potential heteroskedasticity problems and to check for robustness of the main models. Accordingly, the simple Logit model with sector-specific effects is performed and provides an additional robustness check. Furthermore, a sub-group analysis is done to check whether significant motivational differences exist between early and late SBTi members. In other words, corporates that joined before or after the year 2020. To perform the different model specifications and functional forms, the IBM® SPSS® Statistics software (version 28.0.1.1) was used.

4.2.1 OLS model

As stated above, the data sample in this study was converted to a panel data format. Some advantages of panel data are that it contains more information, greater data variability, less co-linearity between the variables, a higher degrees of freedom, and more efficiency in the estimates [Greene, 2003]. Furthermore, panel data models can account for heterogeneity among sectors and firms by controlling for unobserved factors that differ from one firm or sector to another but remain constant over time, which can also be identified as individual effects [Lee, 2009]. This means that, if all or one of the assumptions for exogeneity, and homoskedasticity and non-autocorrelation are violated in the OLS model, it can be argued that a fixed effect model is more suitable [Das, 2019]. Also, in accordance with Wooldridge [2010], accounting for these individual effects is necessary if the same sample is selected for each period in the econometric panel data. Therefore, it is argued not to use a pooled OLS regression method without accounting for specific effects. In line with this reasoning, the first OLS model performed allows for unobserved industry characteristics. More specifically, the first main model includes a set of 10 dummy variables, which equal 1 for corporates in a particular sector, and 0 otherwise. Meaning, each dummy variable captures the sector-effects that are unobserved but are the same for all companies within that specific sector, such as regulations.

Subsequently, time dummies are included to account for time fixed effects in the second main model, which is argued to be important by Wooldridge [2010]. The time-series dimension of the panel data allows us to control for variables that vary over time, which do not vary across firms or sectors [Lee, 2009]. The preliminary empirical work thereby continues with applying OLS to the panel data while accounting for both industry-specific, and time fixed effects. The general assumption that is made here is that no correlation between unobserved variables and the independent variables exist.

The econometric model used in this analysis is the following:

$$Membership_{it} = \alpha_i + \sum_{k=1}^{k} \beta_k X_{kit} + \varepsilon_{it} \tag{4.1}$$

where $\varepsilon_{it} = \mu_i + \eta_{it}$, X are the independent variables, μ_i represent the $N-1$ sector fixed effects, η_{it} are the independent and identically distributed error terms, i represents each sector, k represents the index that varies to encompass all regressors incorporated in the model, and t represents the year.

4.2.2 Robustness analysis

Different approaches are used to assess the robustness of the findings resulting from the models above. The fixed effects model includes firm fixed effects and subsequently adds time fixed effects. The logistic model includes the 10 sector

dummies, similar to the model specification of the OLS model that accounted for sector specific effects, but then with a different functional form.

Fixed effects models

Motivated by the knowledge that unobserved firm-specific effects can also be correlated with the explanatory variables, a firm fixed effects model is chosen to control for the potential endogeneity problem [Marques et al., 2010], and to test for robustness. To this end, unobserved factors that differ between firms, such as location advantages, which are constant over time, are controlled for. These indicator variables are introduced for all corporates in the sample, less one: $N - 1$. In this way, effects that result from sector-specific or firm-specific factors can be separated [Cormier et al., 2005]. To clarify, sector-specific and firm-specific effects are collinear, which is why they cannot be estimated at the same time. Furthermore, one should keep in mind that the use of fixed effects eliminates the bias of time-variant variables, but do not allow estimations of time-invariant variables such as the Sigma Lean Six variable in this research [Marques et al., 2010]. Therefore, the LeanSix variable was excluded in the firm fixed effects regression results.

Subsequently, a model specification where time dummies are included is made, to account for time fixed effects [Wooldridge, 2010]. This allowed for a model that both incorporated firm fixed effects as well as time fixed effects.

Logistic model

Furthermore, another robustness check is done by performing a Logit analysis. Logit models for panel data were also used in other literature, such as in the papers of López et al. [2017] and [Wang, 2017b], whereby the latter also used Logit models to assess robustness of OLS fixed effects model outcomes. In particular, a Logit model was performed here due to the dichotomous dependent variable which takes the value of 1 when a corporate is a SBTi member, and 0 otherwise. Basic assumptions that were made are (1) independence of errors, (2) linearity in the Logit for the continuous variables, (3) absence of multicollinearity, and (4) lack of strongly influential outliers [Pal et al., 2021]. Furthermore, miscalibration is avoided by using a sample size that is larger than 200 observations [Stone and Rasp, 1991]. The following model was thereby considered:

$$Pr[Y = 1|X] = F[\sum_{k=1}^{k} \beta_k X_k] = \frac{1}{1 + e^{-\sum_{k=1}^{k} \beta_k X_k}} \tag{4.2}$$

where Y represents the dependent variable which is a dummy that takes the value of 1 if the corporate is SBTi, and 0 otherwise; X are the independent variables, k represents the index that varies to encompass all regressors incorporated in the model; and F can be approximated using the logistic distribution as defined, which is between 0 and 1 for all values of $\sum_{k=1}^{k} \beta_k X_k$.

4.2.3 Sub-group analysis for early and late adopters

Lastly, one might question the role of time in the corporate motivations to join the SBTi. While this research does not cover whether motives that influence SBTi membership change over the years, the descriptive results of the data showed a significant difference in number of newly established members over the years (Figure 4.3). It was obviously shown that the majority of the corporates in the sample that joined the SBTi became member in 2020 and 2021. To check whether significant motive differences exist between corporates that joined before or after 2020, the following distinction is made. Early adapters are defined as corporates that joined the

SBTi between 2015-2019, and late adapters are defined as corporates that joined the SBTi in 2020 or 2021. To be able to rule whether significant differences between the two joiner types exist, a sub-group analysis was performed.

4.3 QUALITATIVE METHOD

4.3.1 Sample and data collection

Sample selection

The sequential explanatory design of this research allowed for another sample that was selected for the purpose of the qualitative analysis. The sampling method for the selection of interview candidates was twofold. Expert sampling was performed to identify key informants who could inform the researcher with relevant knowledge, experience, and expertise. Experts were identified as interviewees with expertise and knowledge on the SBTi, and the implementation of the initiative in the company where applicable. Moreover, the expert is related to either one of the 138 corporates in the sample as described above, or to the organization of the SBTi, or to a firm that consults Fortune 500 companies on SBTi participation and target setting. The latter two expert types were chosen to provide a helicopter view to the research. Furthermore, convenience sampling allowed the researcher to collect data within time constraints of this research, and to select interviewees that were willing to participate [Sedgwick, 2013]. Although convenience sampling was applied, a roughly equal mix of corporates belonging to both SBTi members and non-members in the interviewee sample was preferred by the researcher, to assess motives of current members and potential future members. Thereby, not limiting the data collected to statements of experts that are involved in a corporate that is a SBTi member. In the sampling period, 68 relevant experts were notified, which eventually led to five interviews conducted. Two interviewees were working for corporates that were SBTi members, two interviewees were working for corporates that were not SBTi members, one interview was working for the SBTi, and one interviewee was working for a relevant consulting firm. A more comprehensive overview of the interview candidates is provided in Appendix B.

Data collection

With regard to the qualitative data collection, in-depth semi-structured interviews were then conducted with experts. The author contacted the experts by email, and LinkedIn messages were sent. Primarily information existed of the research purpose, processes, ethical considerations and implications. With further correspondence and upon confirmation of the study participation, interviews were conducted online due to the geographical distance between interviewer and interviewee. The selected interviewees were also provided with a consent form, participant anonymity, data confidentiality, and an outline of the study objective and scope. Depending on the interviewee, audio recordings were collected.

4.3.2 Qualitative Analysis

For the qualitative analysis, interviews were conducted by the researcher, and took place over Microsoft Teams or Zoom. The researcher used either the telephone and face-to-face modes of the online communication tools, depending on the interviewee's preference. However, there is evidence that not much difference in either the quantity or quality of the data collected by telephone or face-to-face modes is present [Farooq and de Villiers, 2019]. Interviews took place during the year 2022, and were generally conducted in English. One interview was conducted in Dutch,

due to the Dutch mother tongue of both interviewer and interviewee.

The difference in background, expertise, and type of employer of the different interviewees required different initial interview set-ups. That meaning, the structure of the interviews were similar, but the exact phrasing differed between interview candidates that belonged to a Fortune 500 organization in the sample, and the interview candidates that worked for the SBTi or relevant consulting firm. The difference is noticeable in the more general character of the interview questions asked to the consultant and SBTi experts, who worked with different Fortune 500 firms, while questions are more specifically formulated for the corporates in the sample.

After a general introduction of people involved and the research purpose, the semi-structured interview started with general open-ended questions that were asked to the interviewees in relation to why they think their firm joined or not joined the SBTi. This way, the relevant topics could be explored in depth, processes could be better understood, and causes could be assessed by the interviewee. The overarching purpose of these questions was to identify motives that were either assessed or not assessed by the concepts for potential motives as formulated in this study, without directing the interviewees in their answers. The second part of the semi-structured interviews consisted of more specific questions per hypothesis that was formulated. The aim of these questions was to validate the quantitative results. To this end, unexpected results were discussed prior to the discussion of expected results to account for possible time limits. Furthermore, questions were asked open-ended and quantitative results were not presented to the interviewee prior to the question. This strategy was chosen to avoid putting words in the interviewee's mouth [Leech, 2002]. All in all, the order of these two interview parts was chosen as such that the interviewee was able to come up with motives before knowledge on motives as found in extant literature could potentially influence their honest answers. In addition, questions were overall supported by a series of probes and prompts. The questions that were used as guidance during the interviews are shown in Appendix C.

The interviews yielded insight into the perception of different types of experts in the field on the five concepts of motives, as identified by the literature review. Furthermore, with the exception of two interviews, interviews were recorded with the permission of the interviewee, and field notes were maintained during each interview. Based on the audio recordings and notes, interviews were summarized after the interview. Interview summaries can be found in Appendix E. Subsequently, the qualitative analysis approach of Miles et al. [2018] was used. Meaning, contents of the notes were first classified within each motives concept. Then, substantive points within each classification were further categorized if applicable. The table with structured interview outcomes can be found in Appendix F. Results of interviews are discussed in the next chapter.

5 EMPIRICAL RESULTS AND ANALYSIS

5.1 QUANTITATIVE RESULTS

5.1.1 Descriptives

Table 5.1 describes the sample descriptive statistics. The SBTi membership (Membership) had a mean of 0.11, which showed that an obvious larger number of observations in the sample was related to non-membership of a firm. This implies that the outcome of SBTi membership is a relatively rare event in this sample. Consequently, the model choice affects the accuracy of the estimates. As a rule of thumb, Derby [2015] argues that the number of events is rare when the percentage of occurring events, in this case SBTi membership, is less than ten percent of the total sample. While our descriptives show a mean of 11%, future research could consider using the Poisson distribution, which provides an approximation to the binomial for the analysis of rare events, where the number of events is small and the sample size is large.

Furthermore, the advertisement intensity of the corporate (AdvInt) ranged from 0.00 to 0.17 million dollars per sale that was made and had a mean of 0.03 million dollars per sale; the intangible asset ratio (IntagibleAssetsRatio) ranged from 0.00 to 0.87 intangible assets as percentage of a firm's total assets, which indicates a firm's innovativeness, and had a mean of 0.26; and the size of the corporate measured in the natural logarithm of employees (Employees) had a range from 1.31 to 7.74 with a mean of 3.99, implying that the average number of employees of the corporates in the sample lies around 54 thousand employees. Sigma Lean Six (LeanSix) had a mean of 0.48, implying that almost half of the sampled corporates had a Sigma Lean Six certificate. Furthermore, the presence of a risk committee (RiskCommittee) had a mean of 0.12, which showed that 12% of the observations included a risk committee. The number of sustainability committees (SustainabilityCommittee) presented over the observations was slightly lower than that of risk committees, with a mean of 0.08. Furthermore, the incentive-based compensation ratio (IncentiveBasedComp) ranged from 0.44 to 0.97 and had a mean of 0.86, implying that on average, 86% of the total CEO compensation exists of equity-based compensation which is commonly paid based on the CEO's performance. Furthermore, the diversification ratios showed the following. The gender ratio (GenderRatio) ranged from 0.42 to 1.00 and had a mean of 0.73, which indicated that boards in the sample on average consist of a higher proportion of men, namely 73%. The nationality mix ranged from 0.00 to 0.9 (NationalityMix) and had a mean of 0.17, implying that more boards in the sample had a lower proportion of directors from different countries. These descriptive statistics displayed the variation in firm characteristics caused by for example different industries, management styles, or business needs.

5.1.2 Correlations

Table 5.2 provides the Pearson correlation coefficient matrix of the variables, to check for underlying collinearity between the variables. SBTi membership (Membership) is positively correlated with the intangible assets ratio (IntangibleAssetsRatio), nationality mix (NationalityMix), number of employees (Employees), and incentive-

Table 5.1: Descriptive statistics.

Variable	Average	Smallest	Largest	Median	Standard Deviation
Membership	0.11	0.00	1	0.00	0.32
AdvInt	0.03	0.00	0.17	0.02	0.03
IntangibleAssetsRatio	0.26	0.00	0.87	0.22	0.22
Employees	3.99	1.31	7.74	3.99	1.16
LeanSix	0.48	0.00	1	0.00	0.50
RiskCommittee	0.12	0.00	1	0.00	0.32
SustainabilityCommittee	0.08	0.00	1	0.00	0.28
IncentiveBasedComp	0.86	0.44	0.97	0.91	0.12
GenderRatio	0.73	0.42	1	0.73	0.09
NationalityMix	0.17	0.00	0.9	0.20	0.19

based compensation of the CEO (IncentiveBasedComp); and all correlations have a statistical significance of 1%. Furthermore, negative correlation with a statistical significance of 1% is visible between SBTi membership (Membership) and gender ratio of the board (GenderRatio); and negative correlation with a statistical significance of 5% is found between SBTi membership (Membership) and the presence of a risk committee (RiskCommittee). Sigma Lean Six certificates (LeanSix) showed negative relations with SBTi membership (Membership) and both the presence of a sustainability committee (SustainabilityCommittee) and advertisement intensity (AdInt_w) showed positive correlations, but these correlations have no statistical significance. Moreover, no correlation coefficients higher then 0.8 are shown, which implies that no severe multicollinearity is present [Studenmund, 2014].

Table 5.2: Pearson correlation coefficient matrix.

Variable	Membership	AdvInt	Intangible AssetsRatio	Employees	LeanSix	Risk Committee	Sustainability Committee	Incentive BasedComp	Gender Ratio	Nationality Mix
Membership	1									
AdvInt	0.047	1								
Intangible AssetsRatio	0.100 ***	0.206 ***	1							
Employees	0.104 ***	-0.157 ***	-0.084 **	1						
LeanSix	-0.024	-0.123 ***	0.087 **	0.177 ***	1					
RiskCommittee	-0.082 **	-0.045	-0.323 ***	0.010	0.046	1				
Sustainability Committee	0.063 *	0.119***	-0.135 ***	0.084 **	0.049	-0.038	1			
IncentiveBased Comp	0.099 ***	0.029	0.053	0.059 *	0.016	-0.125 ***	0.019	1		
GenderRatio	-0.175 ***	-0.184 ***	0.037	-0.138 ***	-0.030	-0.141 ***	-0.054	-0.124 ***	1	
NationalityMix	0.099 ***	0.191 ***	0.189 ***	0.011	0.087 **	-0.148 ***	0.091 **	-0.002	-0.048	1

Furthermore, to check for multicollinearity between the independent variables, the Variance Inflation Factor (VIF) was used. This method indicates whether the predictor has a strong linear relationship with the other predictors used in the model. A VIF value that is greater than 10, is considered to be a cause for concern [Bowerman and O'connell, 1990]. Results of the analysis are shown in Table 5.3, from which can be seen that all VIF values are well below 10. Therefore, there are no multicollinearity problems among the independent variables in the dataset.

5.1.3 Regression Analysis

The empirical results in Table 5.4 below comprise the results of the estimates from the OLS regression analysis with sector effects. More detailed regression results for columns (A) to (G) in Table 5.4 are included in Appendix D. In the further course

Table 5.3: Variance Inflation Factor (VIF) values.

Variable	VIF
AdvInt	1.199
IntangibleAssets Ratio	1.257
Employees	1.098
LeanSix	1.084
RiskCommittee	1.192
Sustainability Committee	1.074
IncentiveBasedComp	1.041
GenderRatio	1.115
NationalityMix	1.097

of this section, discussion on the results are mainly focused on the grey highlighted columns (F) and (G) which incorporate sector-specific effects and sector-specific effects with time dummies (with 2021 as the reference category), respectively. These columns are considered to be the main models since these models account for individual and time effects, which is required when the same sample is selected for each period in the econometric panel data. Moreover, these models control for unobserved factors that differ from sector to sector and for variables that vary over time. More detailed information can be found in section 4.2. Columns (A) to (E) function as a step-by-step overview of how the main models (F) and (G) are constructed, whereby the number of observations differ across the different model specifications. The reason behind this construction originates from Table 4.1, that showed a significant decrease in the number of observations in the sample as a result of data cleaning. Therefore, regressors were added per concept in columns (A) to (G) to assess the robustness of the quantitative results when the sample size markedly changes.

The empirical results of the OLS regression analysis showed that the adjusted R2 value increased from 0.087 in Model (F) to 0.219 in Model (G). This implies that Model (G) is preferred in terms of goodness of fit. Furthermore, the F-tests were statistically significant ($p < 0.001$), implying there is evidence for heteroskedasticity [Astivia and Zumbo, 2019], and showed F-statistics of 5.253 and 10.390 for Model (F) and Model (G), respectively. Therefore, the empirical linear model can describe the relationship between the dependent and independent variables.

In Model (F), the signs of the coefficients are as expected, with the exceptions of advertisement intensity (AdvInt), the possession of a Sigma Lean Six certificate (LeanSix), of which the former variable was not statistically significant as will be further explained below.

When including the sectors, four out of nine regressors were found significant in Model (F), with this number decreasing to two significant coefficients in Model (G). In line with the expectations were the following relationships between the probability of SBTi membership and the independent variables. Company size measured in the log-transformed variable of employees (Employees) was positively related to SBTi membership, with a regression coefficient of 0.029, and was statistically significant at 1%. This means that the probability of SBTi membership increases with almost 0,3% when the employee size of a corporate increases with 10%. It is thereby confirmed that larger companies are more likely to join the SBTi when accounting for sector effects. This result was also found in Model (G), thus implying that employee size is not correlated with year fixed effects. The coefficient in Model (G) showed the same significance level as Model (F), with a coefficient of 0.039. Meaning, the impact of employee size is slightly bigger when accounting for time fixed effects. Namely, the probability that a firm joins the SBTi increases with almost 4% when the employee size increases with 1%. Furthermore, over the course of models (A) TO (G), Employees remained significant at the 1% level despite the decreasing

Table 5.4: Analysis results of the OLS regression analysis including sector effects. Columns (A)-(E) build up to the grey columns (F) and (G) which include sector-specific effects and additionally time fixed effects in model (G), and are considered as the two main models. Notice that the number of observations differs per column, and decreases when progressing in the modeling. The dependent variable is Membership in all models. Regression coefficients are shown with the p-values between brackets. Reference categories were the Energy sector [GIC_1] for sectors, and the year 2021 (year 7) for time. The data used ranges from the years 2015-2021.

	OLS models[a]					**OLS with sector effects**	**OLS with sector and time effects**
	(A)	**(B)**	**(C)**	**(D)**	**(E)**	**(F)[a]**	**(G)[a,b]**
Intercept	-0.017 (0.259)	-0.013 (0.402)	-0.016 0.295	0.340*** (<0.001)	0.257* (0.073)	0.179 (0.329)	0.182 (0.294)
AdvInt					-0.246 (0.569)	-0.226 (0.623)	0.328 (0.444)
IntangibleAssetsRatio	0.108*** (<0.001)	0.108*** (<0.001)	0.095*** (<0.001)	0.099*** (0.001)	0.144*** (0.010)	0.076 (0.242)	0.026 (0.670)
Employees	0.022*** (<0.001)	0.023*** (<0.001)	0.021*** (<0.001)	0.018*** (0.001)	0.024** (0.014)	0.029*** (0.004)	0.039*** (<0.001)
LeanSix		-0.020* (0.057)	-0.018* (0.074)	-0.027** (0.029)	-0.040* (0.075)	-0.064*** (0.008)	-0.057** (0.010)
RiskCommittee			-0.007 (0.618)	-0.009 (0.599)	-0.052 (0.161)	0.028 (0.605)	0.052 (0.299)
SustainabilityCommittee				0.039* (0.076)	0.066 (0.111)	0.089** (0.032)	0.046 (0.232)
IncentiveBasedComp				0.080 (0.143)	0.167* (0.077)	0.108 (0.257)	0.109) (0.220)
GenderRatio				-0.564*** (<0.001)	-0.563*** (<0.001)	-0.465*** (<0.001)	0.020 (0.871)
NationalityMix				0.075** (0.025	0.115* (0.057)	0.053 (0.396)	0.003 (0.961)
Materials [GIC_2]						-0.055 (0.719)	-0.140 (0.322)
Industrials [GIC_3]						0.031 (0.814)	-0.043 (0.725)
Consumer Discretionary [GIC_4]						0.037 (0.775)	-0.032 (0.794)
Consumer Staples [GIC_5]						0.126 (0.345)	0.078 (0.530)
Health Care [GIC_6]						0.092 (0.491)	0.037 (0.768)
Financials [GIC_7]						-0.054 (0.696)	-0.144 (0.264)
Information Technology [GIC_8]						0.222* (0.092)	0.163 (0.181)
Communication Services [GIC_9]						0.003 (0.984)	-0.078 (0.547)
Real Estate [GIC_11]						0.171 (0.339)	0.112 (0.499)
Number of observations	2620	2620	2429	1770	805	805	805
Adjusted R^2	0.020	0.021	0.020	0.061	0.059	0.087	0.219
F test of model	28.299***	20.098***	13.155***	15.482***	6.567***	5.253***	10.390***

[a] * Significant level at 10%, ** significant level at 5%, *** significant level at 1%.
[b] Time dummies are not reported.

number of observations. These reasons provide evidence that strong statistical support is found for H4.

In addition, the presence of a sustainability committee (SustainabilityCommittee) showed a significant relationship with SBTi membership with a coefficient of 0.089. Meaning, if a company has a stand-alone sustainability committee, the chances of joining the SBTi increase with almost 9% compared to firms with no such a committee. This result was shown at a statistical significance level of 5%. Model (F) therefore provides quite strong evidence for H7. However, the variable was not found

significant in Model (G), and is thus correlated with the year fixed effects. Meaning, within a specific sector a sustainability committee is associated with a higher likeliness for SBTi membership, but when looking at a specific year, the presence of a sustainability committee is not necessarily associated with a higher probability of SBTi membership within that sector. Moreover, looking at the robustness over the course of models (D) to (F), the sustainability committee variable seems sensitive to either a change in sample size, the addition of AdvInt to Model (D), and/or the inclusion of sector specific effects.

Also, strong evidence was found for GenderRatio in Models (D) to (F), which was, on the other hand, obviously highly correlated with year fixed effects. The coefficient of GenderRatio changed from -0.465 ($p < 0.001$) to 0.020 (not significant) in Model (F) and (G), respectively. The former implies that sectors with decreasing gender ratios, thus an increasing percentage of women in the board, were found to be linked to a higher likeliness of a corporate being a member. To be more specific, if the ratio of women in the board increases with 10%, the likeliness of the firm to join the SBTi increases with 4.65%. However, this effect is not noticeable within a year, meaning a higher percentage of women in the board is not per se related to a higher probability of SBTi membership in that sector in each year. All in all, the effect of gender ratio is relatively high, thereby confirming H9.

Furthermore, the Sigma Lean Six (LeanSix) variable was negatively related to SBTi membership, with a regression coefficient of -0.064, and was statistically significant at 1%. This shows that according to Model (F), corporates that are in possession of a Sigma Lean Six certificate, which is used as a proxy for corporate effort in internal improvement, are around 6% less likely to join the SBTi. In Model (G), the significance level (5%) and regression coefficient (-0.057) deviated slightly from Model (F), implying that that correlation between this variable and year-fixed effects is almost not present. Strong evidence is therefore found for rejecting H5.

Regarding the different sectors, the results of Model (F) show that corporates in the sector Information Technology are more likely to become a SBTi member compared to the Energy sector, which is chosen as the reference category by the default settings of the statistical software. Moreover, H1 highlights that corporates in the Energy sector are more likely to join the SBTi. Using this sector as reference category therefore allows for intuitive result interpretation when we compare the sector with other sectors. The coefficient for Information Technology was 0.222, with a statistical significance of 10%. This implied that it is more likely for Information Technology businesses to join the SBTi compared to the Energy sector. More specific, firms in the Information Technology sector have 22% more likeliness to join the SBTi compared to firms in the Energy sector. This result is not consistent with the expectations as formulated in H1. Other sectors were not significant, implying that their sector-specific effects can be considered to be identical to those of the Energy sector, or that industry characteristics which influence SBTi participation have been captured by the other independent variables in the model. A suggestion for future work would be to distinguish the Energy sector from the other sectors by using two groups of sectors: Energy and Other, whereby the latter is a combination of the other ten sectors in the sample. Lastly, one might notice that the variable for the Utilities sector [GIC_10] was excluded. This was done by the software SPSS due to missing correlations.

Lastly, no significance was found for other variables in either Model (F) or Model (G). Albeit the regression signs remained fairly stable, the variable for advertising intensity changed signs from negative to positive in Model (G). Moreover, three variables showed interesting results in terms of significance when studying the course of the models (A) to (F). Namely, the intangible assets ratio (IntangibleAssetsRatio)

lost its significance when including sector specific effects. Since both model (D) as model (E), between which a sharp drop in observations was noticeable, showed significant results, the loss in significance is probably not caused by a changing sample size. Therefore, it is expected that the variable is thus correlated with sector-specific effects. Meaning, sectors with a higher average intangible assets ratio are related to a higher probability of SBTi membership. However, within a certain sector, an increasing intangibility is not necessarily associated with a higher probability of SBTi membership probably due to unobserved industry effects. A similar effect is obvious for the mix in nationalities of the corporate board. Furthermore, the variable for incentive-based CEO compensation (IncentiveBasedComp) was only significant in model (E) at a significance level of 10%. Meaning, the variable might be sensitive to either a change in sample size or sector-specific effects. Available evidence and validation of these factors will be assessed in the qualitative analysis of this research, following in Section 5.2.

5.1.4 Robustness Analysis

Fixed effects models

Equation 4.1 is also estimated using the panel data method while controlling for firm fixed effects, whereby i now represents each firm. Results are shown in Table 5.5. It is important to repeat that firm fixed effects and sector fixed effects are collinear, which is why they cannot be included together. Therefore, the sector dummies in Model (F) and Model (G) were not included in Model (H). This firm-specific regression provides a validation check whether the previous results are robust.

Table 5.5: Analysis results of the OLS regression analysis with firm fixed effects. Column (I) adds time fixed effects to the firm fixed effects model. The dependent variable is Membership in both models. Regression coefficients are shown with the p-values between brackets. The data used ranges from the years 2015-2021.

	OLS with fixed effects[a]	
	(H)[c]	**(I)[b,c]**
Intercept	0.283 (0.438)	0.222 (0.502)
AdvInt	-0.156 (0.935)	0.102 (0.953)
IntangibleAssetsRatio	0.064 (0.737)	0.165 (0.335)
Employees	0.052 (0.409)	-0.010 (0.857)
LeanSix		
RiskCommittee	-0.157 (0.239)	-0.118 (0.328)
SustainabilityCommittee	0.159** (0.028)	0.062 (0.349)
IncentiveBasedComp	0.050 (0.676)	0.034 (0.748)
GenderRatio	-0.945*** (<0.001)	0.149 (0.412)
NationalityMix	0.227 (0.102)	-0.058 (0.648)
Adjusted R^2	0.297	0.432
F test of model	3.340***	5.053***

[a] * Significant level at 10%, ** significant level at 5%, *** significant level at 1%.
[b] Time dummies are not reported.
[c] Firm dummies are not reported.

The empirical results of the within firm fixed effects analysis showed that the adjusted R2 increased in Model (H) (0.297) compared to Model (I) (0.087). In terms of goodness of fit, Model (I) is preferred. Furthermore, the F-statistic of Model (H) and Model (I) were statistically significant ($p < 0.001$) and showed F values of 3.340 and 5.053, respectively.

The variables for the presence of a sustainability committee and the gender ratio in the board showed robust results in Model (H) compared to Model (F). Albeit some increasing coefficients for these variables in the firm fixed effects model, the level of statistical significance and the sign of the regression coefficient showed similar results in the two models. In specific, the firm fixed effects model shows that the probability to join the SBTi increases with almost 16% when a firm has a standalone sustainability committee, and an 1% decrease in men in the board leads to an increased probability to participate in the SBTi of almost 95%. The variables for employee size and the possession of a Sigma Lean Six certificate showed divergent results, potentially due to a twofold of reasons. First, the size of a corporate (Employees) remains probably fairly stable within a given company. Therefore, for the purpose of this research, it might be more insightful to evaluate this variable between corporates in a specific sector, as was done by incorporating the sector dummies in Model (F) and (G). Second, notice that the variable that is used as a proxy for the possession of a Sigma Lean Six certificate (LeanSix) was excluded by the software, due to the constant character of the variable over time within a company. Meaning, each observation of a certain corporate was labeled with a 1 for LeanSix in the dataset, whereby the specific year of certificate achievement was not taken into account due to limited data availability. In short, since these two variables do not vary much over time, a firm fixed effects model might not be the best fit for the data for these variables [Torres-reyna, 2007]. Nevertheless, strong and significant evidence on these variables was found in the main models.

Surprisingly, incorporating the time fixed effects into the firm fixed effects model resulted in no significant results. Meaning, firms with a sustainability committee and an increasing ratio of women in the board were positively related to SBTi membership, while these factors were not necessarily associated with a higher probability of membership within that firm in a specific year. Therefore, the significant outcomes of Model (G) were not robust in comparison with Model (I).

Logistic model

The logit model that is incorporated in Table 5.6 is analysed as another robustness check for the main models. Thereby, the robustness check is done by comparing different outcomes of different modelling approaches. To this end, the overall inferences from Model (F) will be compared with the results of Model (J), the logit model including sector dummies.

The empirical results of Model (J) showed that the chi-square of the Hosmer and Lemeshow test is 10.757 and is not significant. Regarding the strength of association coefficients, the Cox and Snell R2 and Nagelkerke R2 values of Model (J) were 0.116 and 0.227, respectively. The forecast accuracy of the research model was approximately 89.3%; therefore, it is suitable for asserting the relationships between the independent variables and the SBTi membership.

The results of Model (F) and Model (J), that both take the sector-specific effects into account, show stable results. No changes in regression coefficient signs are noticeable, and statistical significance of the considered variables remain stable. That means, the size of the company measured in employees (Employees) (at the 1%

Table 5.6: Analysis results of the logit regression analysis with sector effects. The dependent variable is Membership. Regression coefficients are shown with the p-values between brackets. The data used ranges from the years 2015-2021.

	Logit model[a]	
	(J)	
	Regression Coefficient	*EXP*
Intercept	-19.696 (0.999)	0.000
AdvInt	-3.077 (0.520)	0.046
IntangibleAssetsRatio	1.077 (0.131)	2.935
Employees	0.302*** (0.009)	1.353
LeanSix	-0.617** (0.018)	0.540
RiskCommittee	0.103 (0.867)	1.108
SustainabilityCommittee	0.792* (0.054)	2.208
IncentiveBasedComp	2.044 (0.173)	7.722
GenderRatio	-5.947*** (<0.001)	0.003
NationalityMix	0.657 (0.296)	1.928
Materials [GIC_2]	-0.444 (1.000)	0.641
Industrials [GIC_3]	18.104 (0.999)	72881332.0
Consumer Discretionary [GIC_4]	18.409 (0.999)	98861505.7
Consumer Staples [GIC_5]	19.109 (0.999)	1989599538
Health Care [GIC_6]	18.858 (0.999)	154884888
Financials [GIC_7]	-0.220 (1.000)	0.802
Information Technology [GIC_8]	19.905 (0.999)	441225633
Communication Services [GIC_9]	17.547 (0.999)	41731324.8
Real Estate [GIC_11]	19.900 (0.999)	439171708
Cox and Snell R^2	0.116	
Nagelkerke R^2	0.227	
Chi-square Hosmer and Lemeshow Test	10.757 (0.216)	
Forecast accuracy	89.3%	

[a] * Significant level at 10%, ** significant level at 5%, *** significant level at 1%.

significance level) and the presence of a sustainability committee (at the 10% significance level) are positively related to SBTi membership; and the possession of a Sigma Lean Six certificate (LeanSix) (at the 5% significance level) and the gender ratio of the board (GenderRatio) (at the 1% significance level) are negatively related to the dependent variable. The other variables that were included in the basic model did not show significant outcomes in both Model (F) and Model (J). The only exception is noticeable for the Information Technology sector, which shows no significance in Model (J), compared to a significant regression coefficient in Model (F).

5.1.5 Sub-group analysis for early and late adopters

Unfortunately, the results pertaining the relationships between SBTi membership and the independent variables per joiner type group must be rejected. This means, no evidence is found on differences between early and late adopters by using the assumption of linearity between the dependent and independent variables. In other words, the model results were not significant. The results are presented in Appendix **??** (Figure D.11) and show that both ANOVA F-statistics of the early adapters model including the basic independent variables (with a p-value of 0.094), and the late adapters model including the sector dummies (with a p-value of 0.072) are not significant at the 5% statistical significance level [Siegel, 2016]. Thus, by applying the linear model, there is no statistically significant evidence that describes the differences in potential relations between SBTi membership and the variables of interest for the early and late adapter groups in this sample. Therefore, how potential relations differ between adopter groups might be assessed in further research.

5.1.6 Quantitative conclusions

Concluding words for the model outputs will follow. Thereby, providing an answer for the second sub-question, that was intended to be assessed with quantitative evidence:

"What factors are associated with SBTi participation?"

Analyses of the Models (A) to (J) presented in Tables 5.4, 5.5, and 5.6 can be summarized in the following manner. Overall, the results seem fairly robust over the course of Models (A)-(G). Thereby, the obvious reduction in sample size that was presented in Table 4.1 does not seem to have an effect on the results. The factors for intangibility and nationality mix, however, seem sensitive to the incorporation of sector-specific effects when comparing Models (A)-(E) with main Models (F) and (G). Moreover, the fairly robust results were also confirmed by comparing the sector effects model with the firm fixed effect model, and the logit models. Nevertheless, one could question whether the firm fixed effect model is the ideal fit for the independent variables related to employee size and the possession of a Sigma Lean Six certificate, both variables that with a time invariant character. Remarkable is that the model outcomes do not seem robust when considering time fixed effects. Concluding from the evidence that the variables for sustainability committee and gender ratio in the board loose significance when accounting for unobserved time effects, some correlation with these effects might exist. Meaning, unobserved changes over time might affect whether the relationship between SBTi participation and the regressor exists and is significant.

The model results can be summarized as follows. First, with regard to the legitimacy variables, evidence is found that corporates in the Information Technology sector within this sample are more likely to join the SBTi than corporates in the Energy sector. This finding is not consistent with H1. It is thereby mainly believed that the other sectors included in the analysis have identical sector-specific effects as the reference category. Second, market success showed significant and expected results for the employee size of the firm (H4), but no evidence for end-consumer focus (H3) was found in the main models. Third, with regard to the internal improvement concept, significant and unexpected results for the possession of a Sigma Lean Six certificate were found. Therefore, H5 could be rejected based on these model outcomes. Fourth, social insurance, that was introduced as the fourth concept of corporate motives, was proxied by the presence of a corporate risk committee in the models. However, no evidence for H6 was found due to the absence of significant outcomes. Fifth, several independent variables were considered to deliver

insights on the factors that are derived from a corporate organization culture in relation to SBTi membership. Interestingly, the presence of a sustainability committee appeared to be significant in all models where no time fixed effects were included. Despite its potential correlation with unobserved time effects, there is thus some evidence for H7. In addition, the gender ratio in the board showed highly significant and expected results when only accounting for sector-specific or firm-specific effects, indicating that there is some evidence for more board diversity being related to SBTi participation as well. For both variables, the effect on the probability to join the SBTi further increased when incorporating firm fixed effects. Based on this research model outcomes, H9 can be confirmed. In short, when looking at the main models, no quantitative evidence could be found for H2, H3, H8, and H10, in addition to the already highlighted H6 (RiskCommittee), which is also summarized in Table 5.7.

5.2 QUALITATIVE RESULTS

Motivated by the initial literature review and the quantitative results, qualitative results were obtained by conducting eight interviews. For the sake of brevity, interview results in the form of summaries are included in Appendix E, and a structured and categorized overview of these results is demonstrated tabularly in Appendix F. Thereby, interview outcomes were first structured according to the five concepts for corporate motives as derived from literature, and subsequently further subdivided into different themes per concept. The following paragraphs are dedicated to demonstrating relevant and interesting qualitative findings, structured according to these five concepts. Parallel to this, validation of the quantitative outcomes is discussed to provide present insight into the corroboration of quantitative results by qualitative results. At the end of the chapter, both quantitative and qualitative results are summarized and combined in Table 5.7.

5.2.1 Legitimacy

Stakeholders

Consensus about stakeholders demanding science-based targets from firms was obvious and mentioned by all interviewees. A clear distinction between internal and external stakeholders was made by most of the interviewees. Regarding internal stakeholders, employees were frequently mentioned concerning talent attraction and employee motivation (5/8 interviewees). Interviewees confirmed that the climate intentions of the company motivate employees in their work and that it attracts new talent because of aligned visions on climate ambitions. Regarding external stakeholders, it is believed that a trend towards bolder and bigger climate actions exists. Thereby, investors were mentioned as important and powerful requesters of corporate climate target setting (5/8 interviewees), and customers play an obvious role to all interviewees (8/8 interviewees). For instance, customers' awareness of sustainability is believed to increase (Interviewee A), and clients that are businesses have sustainable selection criteria for their suppliers nowadays (Interviewee C). However, the way of dealing with these stakeholder pressures was addressed differently by different candidates. Interviewees A, B, and D mentioned that science-based targets are demanded by end-consumers to a certain extent, whereby Interviewee H explained that customers probably do not know what the SBTi is. Interestingly, Interviewee A was the only candidate who believed the firm must respond to these end-consumers by actually joining the SBTi to set and achieve ambitious targets, something on which Interviewee B had a critical note:

"Some companies are facing consumers that keep on asking for sustainability. They get tired and just get the checkbox for SBTi. But if they feel happy with the stamp, go for it. Then it is a need for that company." (*Interviewee B*)

Interviewee F explained that using the SBTi just to receive a stamp takes along risks for a company:

"Using the SBTi just to set a target and receive the stamp could be possible, but it is noticed if you do not do anything with your targets. You need to explain why you are not reaching your targets. [...] And companies do not want to be called out on greenwashing." (*Interviewee F*)

While the interviewees agree on the fact that stakeholder pressure from end-consumers is present, they differ in their vision of the role of the SBTi in responding to these pressures. Furthermore, it became obvious that the more common belief exists that, at this point, the decision to join an initiative such as the SBTi is driven by

purchasing power of businesses seeking suppliers (B2B), than that it is driven by end-consumers (B2C) (6/8 interviewees). Thereby, the candidates that confirmed this argument are either involved in the SBTi with wide expertise on different client types or businesses that are involved in end-consumers as well as B2B business practices. According to Interviewee E, U.S. corporates are especially driven by regulative pressures, whilst consumers in Europe are more involved in sustainability and thus are putting more pressure on companies. Interviewee F confirms this by stating that purchasers in the U.S. must purchase according to certain scorecards which in turn, demands climate action from the supplying companies. Thereby, explaining the fact that SBTi participation does not seem to be mainly driven by end-consumers at this point in the U.S. In addition, as a very important argument according to the candidate, Interviewee D mentions that suppliers are being incentivized by the purchasing business, and that purchasing businesses have targets for their supply chain emissions, resulting in targets that cascade along the supply chain. Interviewee C thereby summarizes:

"Some end-consumers are critical, but most customers just buy something because it is cheaper. And with B2B, the clients have selection criteria in their tenders based on their targets. This is becoming a hot topic for businesses." (*Interviewee C*)

While no quantitative evidence was found for H2, the interview results quite convincingly indicate that the common belief exists that end-consumers are indeed asking for ambitious targets, but that this fact does not necessarily result in increased likeliness to join the initiative at this point in the U.S. Purchasing businesses, on the other hand, can be more of an incentive for a company to join the initiative due to their purchasing power that drives change. Thereby, adding richness to our results on firm characteristics that are potentially related to SBTi participation.

Sectors

Due to the varying sectors in which the firms of the interviewees operate, results on which sector is more likely to join the SBTi were hard to interpret. However, two relevant and general findings can be summarized. Following the argumentation of Interviewee D, who is involved in the SBTi, it is believed that companies that are more likely to lobby against future policies that would put their companies at risk are less likely to participate in the SBTi. These companies can often be found within the oil & gas sector. On the other hand, companies that are SBTi members are less likely to lobby against these policies. Therefore, this belief confirms the quantitative outcomes in the sense that the Energy sector is not necessarily the sector with the highest likeliness of joining the SBTi. In fact, the qualitative results argue that companies within the Energy sector are the least likely to join.

This result was further confirmed by Interviewee C, who argued for a higher likeliness to join for companies with less complicated supply chains. This means that companies that are for instance involved in manufacturing have more complex supply chains compared to the supply chains of companies in the Information Technology sector. Therefore, identifying scope 3 emissions is less complex for the Information Technology sector, which makes it less hard, and thus more common, to commit to targets with the SBTi.

5.2.2 Market Success

Innovativeness

Not accounting for individual sector effects resulted in a significant and positive relationship between the proxy for a firm's innovativeness, its intangible assets ra-

tio, and the probability to be a SBTi member in the quantitative results. However, incorporating these sector effects resulted in the non-significance of this variable related to market success. These results were corroborated by the qualitative findings, which are further explained below. Nevertheless, a strong general belief in innovation capabilities was found amongst all interviewees. Implying that almost all interviewees (7/8) argued that innovation capabilities are necessary to set, and especially to reach, science-based targets. The former relates to necessary innovative capabilities to establish targets, such as the ability to gather and analyze the data to set science-based targets (Interviewee A & C). While Interviewee C explained that their company has those innovative capacities and thus was practically able to set targets in the first place, Interviewee A argued their company is struggling with initially accessing and analyzing the data, something that was also recognized by Interviewee G. In particular, Company A experiences difficulties with scope 3 emission data and is thus not able to join the SBTi yet. Whether this has to do with the company's innovative capabilities, or required network formation and collaborative actions remain not universally proven. The latter, necessary innovative capabilities for science-based target reaching, was mentioned twice (Interviewee A and Interviewee E). According to those interviewees, reaching targets requires innovativeness to develop sustainable products to reduce scope 3 emissions, such as sustainable packaging according to Interviewee H. It is thereby argued that an innovation mindset is needed to achieve this.

On the other hand, Interviewee H interestingly mentioned the following that might explain an underlying statement for the positive and significant relationship between intangibility and SBTi participation:

"The highest impact can be made at the bigger companies, which is why those companies are targeted more often by the SBTi. They, of course, have innovative programs. Otherwise, they would not have survived that long." (*Interviewee H*)

However, considering that our quantitative sample existed of Fortune 500 companies, it can be argued that all companies have innovation programs and that it is more about the size of the innovative capabilities that might affect SBTi participation. Moreover, the SBTi even sees a pattern of more innovative companies joining the SBTi. Combining the different inputs of the participants and assessing their consensus gives us strong evidence that a firm's innovativeness is indeed likely to be positively related to SBTi membership.

Competitiveness

As previously mentioned, it is believed that growth through innovation is required for corporate climate action to respond to competitive global pressures [Ajour El Zein et al., 2019]. This fine line between innovation and competitiveness was also reflected in the interview results. The overarching idea was that companies identified themselves as frontrunners in the field, and to maintain that position it is required to identify and reduce their footprint. Related to the SBTi, Interviewee C and Interviewee F interestingly mention:

"You need to be able to compare yourself to competitors and the whole market. Therefore, we need to let our targets be accepted by an external party such as the SBTi. It is a widely supported initiative and therefore we want to participate." (*Interviewee C*)

"The SBTi creates a platform that creates comparative targets. They are all set within the same methodology so you can compare yourself with others, and investors can compare busi-

nesses better. It is a form of competitive benchmarking." (*Interviewee F*)

In line with this reasoning, Interviewee E agrees with the fact that these standardized approaches are really important to compare between businesses, also to make it easier for investors to decide more sustainably. In addition, Interviewee H mentioned this phenomenon as peer benchmarking and considered it a highly relevant argument for joining the initiative since the SBTi is the first standard that makes targets valid and credible. Moreover, the belief exists that a snowball effect exists within a certain sector, meaning that if one company joins, more companies tend to follow (5/8 interviewees). This is one of the most important arguments according to Interviewee H:

"Also, because everybody is doing it: there is peer pressure within a sector. Others will simply join because you cannot be the outlier." (*Interviewee H*)

Joining the SBTi because others join, was, however, not supported by Interviewee B:

"As leaders in the space, you want environmental management and I think we are quite mature in our sustainability program. Joining the initiative only because it is popular is not our vision, but that might be different to others." (*Interviewee B*)

These findings highlight different visions on the SBTi. On the one hand, the collaborative and prominent character of the SBTi stimulates companies to join to compare themselves with competitors, while others look at the popularity of the SBTi as just joining the club that puts a stamp on your target. However, one should note that two of these interview candidates (B and C) were both working in the Information Technology sector, where innovative capabilities and management practices that are required for target sets were said to be available in the company already. For these companies, it seems more obvious to reflect on the SBTi as a tool for competitiveness, while for other sectors it might be harder to identify their footprint and set their targets without the consult of a third party in the first place. Potentially, due to lacking innovative competencies. Moreover, Interviewee B's quote indicates that the maturity of a corporate sustainability program could also be of influence the way corporates envision the SBTi and SBTi participation, a finding that is not previously discussed in this research. This finding was also supported by Interviewee E, who argues that companies that just started with sustainability have a big learning curve and might be more likely to join just because this relatively new field is hard to understand for them. Interviewee F, on the other hand, believes that the more mature the sustainability program, the more the company recognizes the need to set targets. It is thereby argued that you need experts to be able to push for those targets. Since the quantitative research could not provide complementary results, these contrasting findings indicate future work.

Company size

It was quantitatively shown that the number of employees in the firm does have a significant and positive effect on the probability of a company becoming a SBTi member. Company size was related to SBTi participation by five out of eight interview candidates, and all statements that were made during the interviews on this topic reflect agreement with this finding. Several distinguishing ideas for the reason behind this positive relation between large employee companies and SBTi participation were highlighted:

"Bigger companies are often of more interest to stakeholders because the biggest momentum can be gained here. That push from stakeholders is probably of the biggest influence." (*Inter-*

viewee A)

"As a large organization, you want to push" (*Interviewee A*)

"The SBTi targets bigger companies a bit more because the biggest impact can be made here." (*Interviewee D*)

The latter was also confirmed by Interviewee H, who works for a firm that consults on SBTi participation. Furthermore, Interviewee E and Interviewee F argued that target setting and reaching those targets requires resources. People are needed to spread the target-reaching strategy through the whole organization, and it even requires a senior team with sustainability expertise to align targets with the strategy and reach them. These multiple potential underlying reasons why corporates with more employees are more likely to participate are thus ranging from higher stakeholder pressures on bigger companies, having the vision that you want to push climate action as a large organization, the SBTi who simply target the bigger corporates more, and the requirement of human resources. The qualitative results thus corroborate the quantitative findings, but no obvious consensus was found on why this relationship exists. However, the mixed-method results provide strong support for the higher likeliness of companies with a larger employee size to be or become a participant of the SBTi.

5.2.3 Internal Improvement

Over the course of the different quantitative models, the proxy for endeavoring maximizing efficiency, namely the possession of a Sigma Lean Six certificate, showed a robust and significant negative result. In this quantitative research, this implied that endeavoring maximum efficiency is not necessarily related to SBTi participation.

As a supportive argument for this finding, the qualitative findings showed that the belief exists that an external party such as the SBTi is not needed to set and reach targets, to increase efficiency (Interviewee B). Foundational corporate management and a system-centric approach are the support behind documentation and internal target reaching. As a result, the corporate is capable of precise target setting, and consequently maximizing its efficiency, without the help of third parties. This could be an explanation why the relation between the Sigma Lean Six variable, which might indicate that quality and continuous process improvement is already achieved, and SBTi membership showed negative significant quantitative results.

Some other interviewees agreed with Interviewee B on the fact that target, or milestone, setting increases efficiency in the company (4/8 interviewees). Goal orientation in the form of long-term and interim targets is believed to move a whole organization towards a specific goal, which in turn increases efficiency. Some companies even set more aggressive targets than what they know they are capable of, to encourage employees to develop more innovative solutions, thereby also improving efficiency (Interviewee D). Interviewee H mentioned that it will take up to 10 to 20 years to create savings out of the target setting. In the short term, in contrast, it will cost you money to set those targets, which reduces the efficiency. Specifically related to the SBTi, it was mentioned twice that the SBTi could be helpful in that goal orientation, but it was questioned to what extent the initiative currently offers support to set the targets rather than only validating them. In line with this reasoning, Interviewee A said:

"I get it that scope 3 must be included. [...] But scope 3 identification is a big challenge, and missing data is the biggest issue. [...] We need a network stitched together to collect data, and the SBTi does not have solutions for this while they might help in this process."

(Interviewee A)

The SBTi (Interviewee D) argued that validation is indeed their main purpose and that government policy could help with the target setting process in the future rather than the SBTi. To further complicate matters, Interviewee B does not even agree with the criteria the SBTi requires for the targets:

"It is understandable that companies struggle with scope 3, but I think scope 3 is not science related. [...] We do not have the ability to actually reduce other's emissions. That is our opinion." (Interviewee B)

Interestingly, such contradicting views on scope 3 exist. Namely, Interviewee H mentions:

"Scope 3 is difficult for everyone. But it is a myth that we cannot control it, so we cannot influence it. That is just not true. For instance, companies can change all their decisions on the packaging." (Interviewee H)

In addition to these views, Interviewee B mentioned that setting science-based targets with the SBTi is not efficient if they keep on changing those criteria.

In short, it is quite strongly believed that science-based target-setting, in general, has the potential to increase efficiency in the company. However, it was questioned whether a third party such as the SBTi is necessary to achieve this goal orientation, and if so, to what extent the SBTi supports companies in this milestone setting. For instance, the SBTi does not deliver support for the difficult scope 3 identifications and targets, their view on their target criteria has not always been shared by companies, and these criteria are continuously changing; all are rather burdens than making it attractive for companies to set targets for the SBTi. Thereby, implying that internal improvement may be a relevant motive for companies to set science-based targets, but not necessarily via the SBTi.

5.2.4 Social Insurance

Clear consensus was found amongst the corporate interview candidates on the willingness to be a responsible business (6/8 interviewees). Being fair and critical were mentioned by Interviewee B, wanting to do something good for the company was mentioned by Interviewee A, and having a social responsibility was mentioned by Interviewee C. While Interviewee B remained critical in the sense that joining the SBTi is not necessarily the way for the company to act responsibly and prevent reputational or financial losses, others agreed on the belief that the SBTi helps with acting responsible (Interviewee A), and protecting the business against losses (Interviewee C). Interviewees C and F mentioned corporate reputation as something that needs to be sorted to keep clients, and linked it to the SBTi in several ways:

"Target validation by an external organization is good. We need that piece of visibility that the targets are accepted." (Interviewee C), and

"The tricky part is that you do not want to set targets that you cannot make true. Therefore, joining the SBTi was carefully considered since we are being audited all the time." (Interviewee C)

"Corporates face the risk that their reputation will be damaged due to their climate actions, often labeled as greenwashing. You do not want to be called out on greenwashing. Consumers can call you out if you are not being honest about everything. SBTi could help avoid

greenwashing. There are clear metrics, and you need to report" (Interviewee F)

In addition, Interviewee E mentions that it is joining the SBTi that improves your reputation, while not joining the SBTi does not necessarily mean you have a bad reputation. More depth was added by Interviewee D, who also argued for the SBTi's ability to protect a company against reputational and financial losses, and thereby its share- and stakeholders both internally and externally. Moreover, the dimension of policy and transition risk was explicitly added by this candidate:

"Policy & transition risk is the risk companies face due to the introduction of climate policy. There are two ways of dealing with transition risks. The first one is setting science-based targets, and the second one is lobbying against those policies." (Interviewee D)

These insights added another angle to the losses corporates try to prevent. Not only does the prevention of reputational and financial losses seem important in the decision to join, but a wider set of potential losses, such as geopolitical and technological risks, are considered. These potential losses are all covered by the policy & transition risks.

In short, according to these qualitative findings, a fairly broad belief thus exists that corporates are willing to act responsibly, and almost all candidates argued that preventing reputational and financial losses can be achieved by joining the SBTi. While quantitative results remained undetermined for H6, qualitative results indicate that the motive of joining the SBTi to mitigate certain risks exists in the corporate landscape. Moreover, reasons to join the SBTi seem to go beyond preventing these financial and reputational losses. Businesses nowadays face important policy & transition risks, which they try to mitigate by either setting science-based targets, or lobbying against future policies. The latter is, however, more frequently done by corporates in the oil and gas sector, as was discussed above.

5.2.5 Organizational Culture

Diversity

It is commonly believed that diversity from different angles is always good for decisions around climate action (5/8 interviewees). None of the candidates was, however, able to distinguish between gender diversity and nationality diversity that affect decisions around SBTi participation. It was furthermore believed that sustainability practices of a company attract young talent and that this naturally leads to diversity (Interviewee C). Interestingly, Interviewee E mentioned that a significant relation between gender ratio on the board and SBTi membership could also be a result of a company's progressive attitude. As an example, the candidate mentioned that their company is actively involved in committing to sustainability as well as committing to diversity, inclusion, and equity. Therefore, the significant positive relationship between gender ratio and SBTi membership as was seen in the quantitative results could also be a result of a company's ambition to commit to progressive matters such as diversity and sustainability in the company, implying that gender ratio might be correlated with a company's level of progressiveness.

Leadership commitment and incentives

Furthermore, although Interviewee B believed diversity on the board is good to have, it is fundamental to have a commitment from the top. This finding was confirmed by others (5/8 interviewees). Interviewee A mentioned that the decision to join the SBTi is a leadership decision, whereby especially the CEO decides if the company makes a certain commitment. The board, in general, should constantly be

pushing and leaning into different climate areas. Interviewee B adds that corporate staff thereby has the job to be aware of different climate initiatives such as the SBTi and to communicate it to the board. Interviewee H found the following the most important determinant for SBTi participation:

"The real differentiating factor is whether the CEO wants to be a leader or not. [...] It is really about the company's mission and vision." (Interviewee H)

Furthermore, from an internal leadership perspective, Interviewees E, F, G, and H mention joining the SBTi in relation to clarity and guidance. It is strongly believed that joining the SBTi brings clarity to the target number, which improved internal communication on certain reduction percentages with senior management and the C-suite. In addition, the SBTi creates a guiding start for the company's strategy.

Almost as important seems the trust in the leadership commitment that employees must have. This was an insight that was very specifically mentioned twice. Interviewee B truly believed that a CEO has an excessive amount of things to deal with, which is why trust in their actions to be responsible exists. Interviewee E mentions that we need to have faith in the commitment to science-based targets because nobody can define a clear pathway towards these targets at this point.

Moreover, as was tested in the quantitative analysis, asked was whether the interview candidate believed CEO compensation works as an incentive for leadership to commit to science-based targets via the SBTi. Some qualitative indications were provided, whereby the overarching idea that was shared by two interviewees is that incentives might help, but will not necessarily push the decision to join the SBTi over the decision-line. Interviewee A thereby explicitly mentioned that incentives are related to measuring and tracking progression, which increases the likelihood of actions to happen. In addition, Interviewee H suggested that CEO incentives might help, but that it is crucial to link the bonus structure to the environmental program. Whether this is affected by sector-specific characteristics, as was shown in the quantitative results, was not made clear from the interviews.

Sustainability committee

The interview candidates that participated in the interviews and that were corporate employees were all related to the corporate sustainability committee or community within the firm. All of them believed the sustainability committee or community contributed to either climate action or SBTi participation in specific. In addition, Interviewee D, who works for the SBTi, experiences a significant increase in employee size of sustainability committees compared to, for example, four years ago; and argued that in their validation process, the SBTi typically speaks to an employee from a sustainability department. The following quote provides an idea of why it is expected that corporates with a sustainability committee are more likely to join the SBTi:

"Having numbers of layers in the organization is important. Every functional silo plays a role, but you need a way to connect all expertise and depth, to be able to feed leadership. We do this with our sustainability committee that covers different pillars within sustainability." (Interviewee A)

Furthermore, Interviewee E adds that a senior team that spreads the sustainability goals in the whole company is necessary and that people with expertise in sustainability are needed to align targets with the strategy and subsequently reach those targets. Interviewee G also mentions that a company needs a central function to

implement targets into the organization, and adds that tools are needed to let everybody act. The findings from these several interviewees provide support for the quantitative findings of the presence of a sustainability committee being related to an increased likeliness of SBTi participation.

Conservative corporate culture

Lastly, critical input was given by Interviewee E on the fact that some corporates do not see the need in participating in a standardized approach such as the SBTi to set targets. Namely, according to this candidate, companies that think they can set credible science-based targets by themselves are conservative. Those companies have strict management which is aligned with targets, which is why they need to know every step that needs to be completed to get to the targets. However, science-based targets have no clear pathway which means that a company has to have some faith in the approach, while this is often not envisioned by conservative companies. In general, an important finding here is that the corporate culture in terms of progressiveness or conservativeness of the company could affect whether the company participates in the SBTi. This potential relationship was also seen in terms of the progressive attitude of corporates to both diversity and sustainability. While the evidence provided here is only a slight indication, it adds richness to the overall work and might be further considered in future research.

5.2.6 Qualitative conclusions

In Section 5.2, the results of the qualitative analysis were summarized, which provided us with a more detailed and richer view of the quantitative outcomes in addition to some new relevant insights. Thereby also providing an answer to subquestion 3:

"How do different factors influence the decision to participate in the SBTi?"

Overall, albeit the different sectors and expertise of the interview candidates, the qualitative results were quite consistent among the interviewees. Perhaps, this indicates the potential to generalize findings. First, about legitimacy factors, interviewees agreed that end-consumers in the U.S. give pressure to set science-based targets to a certain extent, but it is widely believed that the purchasing power of businesses is more of an incentive for corporates to set these targets, whether or not via the SBTi. Thereby, addressing the second hypothesis for which we found no evidence in the quantitative study. Moreover, a consensus was found on the importance of setting science-based targets as a way of talent attraction, implying that pressure from employees seems an important factor as well. Additionally, investors, the U.S. government, and competitors were frequently mentioned as important stakeholders. Furthermore, from the interview results, it became clear that sector differences are relevant. More specifically, either corporates in sectors with complex supply chains are less likely to join the SBTi, or corporates in sectors that are more likely to lobby against policies are less likely to join, such as the Energy sector. This finding corroborates with and provides explanatory evidence for the quantitative results.

Second, regarding the concept of market success, a pattern of more innovative companies joining the SBTi is noticed by the SBTi, and seven out of eight interviewees mentioned innovative capabilities that are necessary to set and/or reach science-based targets. Interestingly, competitiveness as a reason to participate was also clearly reflected. The popularity of the SBTi seems an important reason to participate, either because the company wants to maintain its frontrunning position, or because the standardized approach of the SBTi allows for peer benchmarking. In

addition, peer pressure could spur SBTi membership within a specific sector. Nevertheless, the extent to which competitiveness could be a reason to participate seems to differ between corporates, and sectors. Meaning, that corporates that are further progressing with their innovativeness, such as companies in the Information Technology sector, seem to be less struggling with setting targets in the first place. In turn, those corporates seem to be more likely to see competitiveness as a reason to join the SBTi, whilst others are more concerned with improving their innovative capabilities in the first place. Thus, it is seen that the qualitative results corroborated the quantitative results on the fact that the level of corporate innovativeness can differ between sectors. Moreover, it is expected that the maturity of a corporate's sustainability program could also be of influence on SBTi participation, something that was highlighted by two interviewees. Furthermore, quantitative evidence on employee size was in line with the interview results, implying that larger employee companies are more likely to join. Qualitative findings provided several reasons for this phenomenon: bigger stakeholder pressures on bigger companies, the necessity of human resources to set and reach targets, and the SBTi that targets bigger companies more frequently.

Third, internal improvement was assessed twofold. First, one interviewee interestingly mentioned that a foundational management and system-centric approach allows a company for precise science-based target setting and thereby maximizing its efficiency without the need for the involvement of third parties. This might explain the negative quantitative relation between the possession of a Sigma Lean Six certificate and SBTi participation, thereby assuming that foundational management of processes is established by the Sigma Lean Six approach. Second, the wide belief existed that milestone setting increases efficiency in the company, whereby two interviewees implied that the SBTi could help in this process. However, it was questioned to what extent the SBTi currently offers support to set the targets, and whether it is attractive to set those targets via the SBTi due to some identified burdens. For instance, the SBTi does not deliver support for the difficult scope 3 identifications and targets, their view on their target criteria has not always been shared by companies, and these criteria are continuously changing. Overall, the qualitative results imply that internal improvement may be a relevant determinant for companies to set science-based targets in general, but not necessarily via the SBTi.

Fourth, regarding social insurance, a consensus was found on the willingness to be a responsible business and to protect the business against losses by acting sustainably. Except for one interviewee, others agreed on the fact that SBTi could help with that, mostly because of external target validation and concerning corporate reputation. Thereby, preventing the corporate from being seen as a greenwashing company by stakeholders. Interestingly, the concept of social insurance was also assessed from a broader perspective than reputational and financial losses. Thereby, a wider set of potential losses, covered by the policy and transition risks, seem a reason for a corporate to join the SBTi.

Lastly, the concept of organizational culture was discussed from different angles. Foremost, the corporate culture in terms of the mission and vision of leadership was emphasized in the qualitative study. Externally, the most important finding is that joining the SBTi has to do with whether the CEO and its firm's strategy want to be a leader or not. Internally, joining the SBTi helps with pushing the whole organization via credible targets that guide the corporate. An important element thereby is that the SBTi provides clarity into the target number which helps in the communication of targets and ambitions from different layers in the organization to the C-suite. According to half of the candidates, another fundamental aspect is the actual commitment from the top and communication on climate actions from the

corporate staff to leadership. This finding was supported by answers to the question of whether a sustainability committee contributes to SBTi participation. More specifically, a sustainability committee is believed to be necessary to feed leadership with information and to spread goals into the organization and the corporate strategy. All corporate interviews were involved in such a committee, or community, which might make this outcome biased. However, from their helicopter view, interviewees that worked for the SBTi agreed, contributing to having sufficient explanations for the quantitative result that a sustainability committee is significantly related to SBTi membership.

Furthermore, diversity was a topic on which all interviewees had the feeling that it is always good to have for decisions around climate action. No clear distinguishment between gender and nationality diversity could thereby be made. However, one interviewee made it clear that the relationship between diversity and SBTi participation could also be because of a company's progressive culture. Meaning, that companies involved in climate commitments often have made diversity, equity, and inclusion commitments as well. Therefore, some explanation is provided for the quantitative outcomes on H9 and H10, but one should keep in mind that progressiveness could be an underlying factor affecting this relationship. Furthermore, mixed formulations were found on CEO compensation functioning as an incentive to participate, but the overarching idea that was found is that financial incentives do not necessarily push the decision to join the SBTi over the decision line. Thereby, addressing the quantitative hypothesis on incentive-based CEO compensation (H8).

Some concluding words must be devoted to somewhat opposing views of one non-member in the qualitative sample. While the employing company of Interviewee A (non-member) was striving to join the SBTi but has not joined due to difficulties to set science-based targets, the employing company of Interviewee B (non-member) was not. However, it is important to explicitly mention that corporate B has set science-based targets. The reasons for not joining the SBTi were mainly due to the nonnecessity of joining the SBTi due to its own established management system, envisioning the SBTi as an organization that puts a label on corporate targets, and some disagreement on the SBTi's approach. Based on the researcher's background knowledge of the different corporates that were involved, from the interviews with Interviewee B, Interviewee D, and Interviewee E, it emerged that the way a corporate envisioned the SBTi could differ between different corporate cultures. To be more specific, progressiveness and conservativeness of the company could be an underlying factors why a corporate decides to join or not. These qualitative research outcomes only give a tentative indication of this difference but are important to consider in future research. Nevertheless, these results indicate that the fifth concept of Organizational Culture that was appended to the original framework of Simões-Coelho and Figueira [2021] adds value to the overall research.

5.3 SUMMARY OF QUANTITATIVE AND QUALITATIVE RESULTS

The main results of the previous sections are summarized in Table 5.7. The table includes quantitative and qualitative results which are categorized per concept and relevant determining factors for SBTi participation. The results are ranked by importance based on the emphasis in interviews, the frequency with which the factor is mentioned, and our statistical results. The findings of both methods could be corroborating, explanatory to one another, adding richness to the overall results, or opposing, which reflects the mixed-method approach.

Table 5.7: Summarizing table that includes quantitative (QUAN) and qualitative (QUAL) results categorized per concept and relevant determining factor to participate in the SBTi that are ranked by importance. Hypotheses are repeated for factors that were quantitatively assessed and shown between brackets. Results are elaborated upon in the last column, and a legend of the symbols used is presented below the table. (a) The overall most important findings are based on the QUAN and QUAL results that could be corroborating, explanatory, additional, or different, and the researcher's interpretation of these results.

	Factor (hypothesis with expected direction)	*QUAN*	*QUAL*	*Overall most important findings*[a]
Legitimacy	**STAKEHOLDERS** (*H2* End-consumer focused corporates (B2C) are more likely to participate in the SBTi than those that are business-focused (B2B), +)	⊗	○ ◉	While the QUAN results could not provide evidence for H2, QUAL results explain that it is believed that purchasers are, at this point in time, exerting more pressure than end-consumers due to regulative pressures in the U.S., in addition to less sustainability awareness of American end-consumers compared to, for instance, EU end-consumers. Therefore, pushing firms more to join the SBTi than end-consumers. Moreover, other important stakeholders are investors, competitors, the U.S. government, and employees.
	SECTORS (*H1* Corporates that operate in the Energy sector are more likely to join the SBTi, +)	○	○	Contrasting the expectations, both results show that corporates in the Energy sector are not more likely to join the SBTi than other sectors. In fact, corporates in sectors with complex supply chains are less likely to join the SBTi, and corporates in sectors that are more likely to lobby against future policies are less likely to join, such as the Energy sector.
Market Success	**COMPETITIVENESS**		◉	QUAL results show that competitiveness is an emphasized important determinant for corporates to participate in several ways. First, the standardized approach of the SBTi allows for *peer benchmarking.* A company can thereby compare credible targets with other firms, or investors can accurately compare between different firms. Second, a firm is usually willing to maintain its *frontrunning* position compared to its competitors, whereby the SBTi's popularity spurs a company to join. In addition, a *peer pressure* element is noticeable within sectors. Meaning, firms usually are not willing to be the outlier in the sector. Nevertheless, results also indicate that the maturity of a firm's sustainability program could affect whether a firm feels the need to join the SBTi because it is popular.
	EMPLOYEE SIZE (*H4* Larger employee corporates are more likely to participate in the SBTi, +)	●	●	The results corroborate. The bigger the employee size, the more likely a firm is to join the SBTi since target setting and reaching requires (human) resources, bigger firms experience more stakeholder pressure, and the SBTi targets larger companies more because the biggest impact can be made here.
	INNOVATIVENESS (*H3* Corporates with greater innovativeness are more likely to participate in the SBTi, +)	⊗	●	QUAN results indicate that innovative capabilities are sector specific; QUAL corroborates this finding and confirms that innovative capabilities are required for target setting and target reaching, thus joining the SBTi. The extent to which these capabilities are present in the firm depends on the sector according to the interviewees.
Internal Improvement	**EFFICIENCY** (*H5* Corporates that endeavor maximizing efficiency are more likely to participate in the SBTi, +)	○	○	Unexpectedly, improving internal efficiency is believed not to be a determinant of SBTi participation. While milestone setting in general is believed to improve the internal processes of the firm, involvement of the SBTi in the target setting process seem to hold things back. Namely, it is questioned to what extent the SBTi offers support for target setting, in specific for difficult scope 3 emission reductions, and whether their changing criteria are shared by corporates.
Social Insurance	**RISKS** (*H6* Corporates that endeavor the prevention of reputational and financial losses are more likely to participate in the SBTi, +)	⊗	●	Although QUAN results do not provide evidence for a risk committee that is related to SBTi participation, QUAL results show that identified corporate risks could be a determinant to join the SBTi. First, a corporate's willingness to act responsible and to prevent losses by acting sustainably are related to *reputation risks,* whereby it is believed that corporates do not want to be labeled as a greenwashing company. Joining the SBTi makes its targets credible and validated, which helps with mitigating these reputation risks. Second, *policy and transition risks* cause a corporate to either set science-based targets (via the SBTi), or lobby against future policies to mitigate those risks. The latter is thereby often noticed in the Energy sector.
Organizational Culture	**LEADERSHIP**		◉	QUAL results emphasized the importance of a corporate's mission and vision on leadership when considering SBTi membership. *Externally,* the most important finding is that joining the SBTi has to do with whether the CEO and its firm's strategy want to be a leader or not. *Internally,* joining the SBTi helps with steering internal leadership on sustainability through the whole organization via credible and guiding targets. An important element thereby is that the SBTi provides clarity into the target number which helps in the communication of targets and ambitions from different layers in the organization to the C-suite.
	SUSTAINABILITY COMMITTEE (*H7* Corporates with a stand-alone sustainability committee are more likely to participate in the SBTi, +)	●	●	The results corroborate. QUAN analysis shows that results are sensitive to time fixed effects. QUAL results show that a sustainability committee increases the likeliness of a firm to join because its central function helps to connect sustainability expertise in order to feed leadership, and to spread sustainability through the whole organization.
	CORPORATE PROGRESSIVENESS		◉	Corporates that have a progressive corporate culture tend to be more likely to join than conservative corporates, because the former see the added value of credible and validated targets over their own target setting processes, while the latter often have an established management and system-centric structure where target setting via an external party is not needed for their business goals.
	BOARD GENDER RATIO (*H9* Corporates with gender diverse boards are more likely to participate in the SBTi, +)	●	⊗	QUAN results convincingly show that a decrease in men in the board leads to a higher probability of a firm to join the SBTi. While QUAL results reflected that diversity in the board is good to have with respect to sustainability, it was not clarified whether and how gender specifically affects SBTi participation.
	INCENTIVE BASED CEO COMPENSATION (*H8a/b* Corporates with relative high incentive-based compensation are more/less likely to participate in the SBTi, +/-)	⊗	○	QUAN results show that the level of CEO compensation is influenced by sector specific effects. QUAL did not specifically address this finding. The QUAL results unexpectedly explain that incentives might help in corporate sustainability practices, but they will not necessarily push a decision such as joining the SBTi over the decision line.
	BOARD NATIONALITY MIX (*H10* Corporates with multinational diverse boards are more likely to participate in the SBTi, +)	⊗	⊗	Similar to a firm's gender ratio on the board, QUAL results reflected that diversity on the board is good to have concerning sustainability, but whether and how a mix of nationalities on the board affects SBTi participation was unknown to the interviewees.

Note: Black circles (●) indicate there is evidence and that results align with expectations; blank circles (○) indicate there is evidence but that results do not align with expectations; circles with a 'x' (⊗) indicate that no evidence was found but expectations were made; gray circles (◉) indicate there is convincing evidence that adds richness to the overall work, but no specific expectations were made in advance; and blank cells indicate the factor was not assessed by the method.

6 DISCUSSION

In this study, a mixed-method approach was used to research why corporates join the SBTi. To this end, statistical analyses were performed with a sample of the Fortune 500 corporates, and semi-structured interviews were subsequently held with eight experts. The value of the mixed-method approach can be found in the complementarity of the qualitative findings to the quantitative findings and vice versa. On the one hand, the quantitative findings provided insight into whether certain firm characteristics are associated with SBTi participation. On the other hand, the qualitative study highlighted other potential determinants of SBTi membership, such as motives, reasons, and drivers. Furthermore, the research approach increased the generalizability of the research, provided us with more detailed insights on quantitative outcomes, and the triangulation increased the credibility of the results [Creswell, 2014]. In the following chapter, research findings and their validity, the research approach, the initial framework that was used, and the contributions to literature will be discussed; to conclude with the methodological discussion, which is divided into the quantitative and qualitative methods.

6.1 RESULTS OF THE MIXED-METHOD ANALYSIS

Analyzing the results of the quantitative analysis and comparing them with the qualitative analysis and the broader literature, certain insights can be drawn. Following the structure of the foregoing, the concepts of Legitimacy, Market Success, Internal Improvement, Social Insurance, and Organizational Culture will be discussed sequentially. Table 5.7, which provided an overview of the main findings, is thereby used as starting point to guide the most important and/or unexpected study outcomes in this section.

6.1.1 Legitimacy

Stakeholders

First and foremost concerning the legitimacy concept, the qualitative outcomes added another angle to legitimate determinants of SBTi participation that were not assessed by quantitative analysis. Meaning, that not only the pressure of consumers and business clients was discussed, but other stakeholders were also revealed by almost all interviewees. Employees were mentioned the most besides clients, and investors frequently came to light. Both stakeholder groups were considered to be an important reason for improving the corporate climate agenda by several other studies as well [Ersoy and Aksehirli, 2015; Deloitte, 2019; Simões-Coelho and Figueira, 2021; Lyon and Maxwell, 1999; Okereke, 2007]. The qualitative results thus provide proof of the importance of these stakeholder groups for SBTi participation. This is following extant literature on corporate climate action and voluntary initiative participation. Thereby, increasing the credibility of these qualitative outcomes, and creating abundant room for further progress on potential legitimate reasons to participate.

Second, to address the second hypothesis for which no evidence was found in the quantitative study, the interviews also addressed the role of end-consumers and business clients in stakeholder pressure. End-consumers are considered as important for corporate climate action [Deloitte, 2019; Lyon and Maxwell, 1999], and Haddock-Fraser and Tourelle [2010] found proof that end-consumer focused companies are more often involved in environmental activities than business-to-business companies. While the former was confirmed by our qualitative results, the latter contrasts with our findings. Meaning, that more than half of the interviewees unexpectedly argued that joining the SBTi is driven by purchasing power (B2B) rather than by end-consumers. A reason for this is that purchasing companies often have set climate targets and the supplying company is part of their supply chain which has strict emission targets. Another reason is that the climate ambitions of the supplying company must not lag behind its clients and partners.

Two explanations of these contradicting current research results with extant literature could be the small sample size of the qualitative study or the different continents on which the studies were focused. Means, the research of Haddock-Fraser and Tourelle [2010] was focused on UK companies, and the interviews focused on U.S. companies. The U.S. companies are, according to two interviewees, mostly driven by regulative pressures, whilst consumers in the EU are more sustainability aware and therefore put more pressure on companies, as is also confirmed by the recent study of GlobeScan [2020]. Moreover, the exploratory nature of Haddock-Fraser and Tourelle [2010]'s study, only assessed the association between C2C companies and sustainable development rather than exploring whether consumer pressures cause actual climate action, for which qualitative research as an addition to quantitative analyses is required. Our interviews, on which our findings are based, explored potential causes of corporate climate action, which goes beyond limiting our research to investigating several proxies for climate action that are voluntarily disclosed in public databases and SBTi participation. Our results thereby show the added value of the mixed-method approach in finding both associations and causation between determining factors and climate action, in comparison with extant literature that limited itself to quantitative research.

Nevertheless, both literature, and qualitative analysis provide convincing outcomes for an existing relationship between end-consumer focus and SBTi participation. Therefore, it could also be questioned whether the proxy for end-consumer focus, advertising intensity, is well chosen for quantitative research. Considerably more work will need to be done to determine whether other proxies for end-consumer focus provide significant evidence, that either supports qualitative analysis or extant literature.

Sectors

our results showed an interesting unexpected finding about sectors. It became evident that the likeliness of corporates to join the SBTi differs per sector, which confirms extant studies [Haddock-Fraser and Tourelle, 2010; Brønn and Vidaver-Cohen, 2009; Deloitte, 2019]. However, quantitative results showed that corporates in the Information Technology sectors are more likely to join than corporates in the Energy sector. This finding contrasts the findings of Brønn and Vidaver-Cohen [2009]; Deloitte [2019], who argued that the Energy sector is the most legitimacy-challenged and is thus related to increased climate action. Therefore, it was expected that this sector is also more likely to participate in the SBTi. Two potential explanations for this unexpected result stemmed from the qualitative findings. First, it is believed that firms with less complex supply chains, such as corporates in the Information Technology sector, are more likely to join. Second, arising from policy and transition risk, corporates in the Energy sector are more likely to lobby against policies to

protect themselves from future losses, rather than setting science-based targets.

Differences in study outcomes could thus be explained based on the SBTi's focus on setting science-based targets, which in general seems less preferred by energy corporates compared to lobbying against future policies. This phenomenon was, however, not mentioned by Brønn and Vidaver-Cohen [2009] who focused on corporate motives to join voluntary social initiatives. Their work is limited to motives to join these initiatives by providing a questionnaire. Thereby, ignoring other preferred actions or reasons of corporates not to join, such as lobbying against policies, might outweigh potential motives to participate in these voluntary initiatives. Our work thus indicates to use interviews rather than questionnaires for identifying determinants for climate action.

6.1.2 Market Success

Competitiveness

Most importantly, the qualitative data showed that competitiveness plays a significant role in joining the SBTi. Participants identified their company as a frontrunner in the sector, pushing them to set science-based targets to maintain that position. From the perspective of extant literature, global competitive pressures were also found to be a common stimulus for corporate climate action [Ajour El Zein et al., 2019]. Interestingly, the qualitative results added more detail, specifically concerning the SBTi. Namely, peer pressure to join seems to exist within a sector, since corporates do not want to be the outlier. In addition, some believed that the standardized approach of the SBTi is ideal to compare yourself to competitors and the market, while others criticized its popularity because it is believed that some companies join just to receive a stamp or to belong to the community. This might have something to do with the maturity of a corporate's climate program, whereby companies that recently started with sustainability practices, have a big learning curve. Therefore, these companies are perhaps more likely to join because the field is unexplored. Although this result is fairly weak since it is built on suggestive remarks of two interviewees, literature on corporate sustainability provides further clarification. Namely, from the perspective of embedding sustainability into an organization, it is believed that voluntary initiatives have been developed for corporates to engage more with sustainability [Lozano, 2012]. Thereby, potentially supporting companies that are new in the field. Nevertheless, the suggestive input from the interviewees provides a stepping stone for future research on the association between and the effect of the maturity of corporate sustainability on joining the SBTi, or climate initiatives in general.

Employee size

Second, our analyses showed convincing and expected outcomes for a firm's employee size in relation to SBTi membership. Namely, the study results of Lyon and Maxwell [1999] and Balasubramanian et al. [2021] suggested that firms with more employees are more likely to take climate action, and our quantitative results showed strong evidence for this positive relationship in the main models. This result was convincingly confirmed by the interviewees, thereby increasing the credibility of the results. Insightful, it was argued that bigger companies experience a bigger pressure from stakeholders to act sustainably, thereby confirming the findings of Lyon and Maxwell [1999]. Furthermore, interviews indicated that science-based target setting and reaching require more human resources, which is in line with study results of Amran et al. [2012]. Their study suggests that bigger firms may have more expertise in the field of climate change and more resources to execute projects to perform climate action. Moreover, qualitative results show that the

SBTi appeared to target larger organizations more since the biggest impact can be made there. This could also explain the study's expected outcomes.

Innovativeness

In line with the above, the literature reflected that competitive global pressures stimulate corporate climate intentions and actions, for which growth through innovation is required, which in turn requires innovative capabilities of the firm [Ajour El Zein et al., 2019; Montresor and Vezzani, 2016; Montes et al., 2004]. A firm's greater innovativeness was therefore hypothesized to be stimulating SBTi participation. While the main econometric models did not show significant results, other models used indicated that innovative capabilities differ between sectors. The latter was confirmed by the qualitative research outcomes, and a clear consensus amongst all participants on innovativeness being important to science-based targets existed. This relation seemed to exist due to twofold of reasons. First, some innovative capabilities, such as data gathering and analysis, are required to set science-based targets. Second, innovative capabilities are necessary for target reaching, for instance in the form of product innovations to reduce scope 3 emissions. This line of argumentation is also confirmed by several studies Deloitte [2022]; Walz et al. [2017]; Downie and Stubbs [2013], and indicate that firms with greater innovative capabilities are more likely to join because of the necessity to possess those when joining.

As mentioned, our study additionally indicates that considering sector differences in this association is relevant, also for future work on this topic. Namely, in line with the quantitative course of results, the qualitative outcomes highlighted that the nature of the Information Technology sector seemed to trigger these corporates to have the necessary analytical tools on board to calculate emissions, set targets, and subsequently meet them. Therefore, corporates in this sector seemed more advanced in their innovative capabilities that are required to set and reach targets, compared to other sectors in the sample that were still struggling with data gathering and analysis in the first place. It thus became clear that innovativeness differs across sectors, perhaps due to the nature of a certain sector and its trends, which can be confirmed by the research of Potters [2009]; Malerba [2004]. The qualitative data and literature found thus provide some clarification for the change in statistically insignificant results. However, it is suggested to do a further deep dive into differences in determining factors to participate in the SBTi between sectors.

6.1.3 Internal Improvement

Our results on internal improvement as a determining factor to join the SBTi were interestingly unexpected. The quantitative results namely indicated that endeavoring maximizing efficiency, proxied by the possession of a Sigma Lean Six certificate, is negatively related to SBTi participation. This contradicts the studies of Windolph et al. [2014]; Steger et al. [2007]; Lozano [2015], who implied that one driver to engage in sustainability practices is the willingness to increase efficiency, which was investigated by different methods among which a mixed-method approach. Interestingly, our qualitative findings corroborate both. On the one hand, it was widely believed that science-based target setting as a means of sustainability efforts can increase efficiency in the firm. Thereby, agreeing with extant literature on this topic. On the other hand, it was questioned whether a third party such as the SBTi is necessary for the target setting process, to what extent the SBTi currently offers support to set the targets, and whether it is attractive to set those targets via the SBTi due to some identified burdens, such as lack of agreement on their target criteria and the fact that these criteria are continuously changing. By that means, implying that maximizing efficiency is a reason for corporates for climate action, while this not necessarily holds for SBTi participation; thereby potentially explaining the

quantitative outcome. However, one limitation of our study is the small sample size of the qualitative study, which could have impacted this study's outcome that was based on relatively few identified burdens that are related to the uniqueness of the SBTi. Furthermore, one could question the effectiveness of the proxy that was used, by which the choice of the proxy was a result of limited data availability for the quantitative study. These limitations will be further explained below. In summary, it is noticed that the ongoing discussion asks for future clarity on the role of the SBTi in the degree of internal improvement, and to let corporates understand the advantages of target setting via the SBTi.

6.1.4 Social insurance

No quantitative evidence was found on the relationship between corporates attempting to prevent reputations and financial losses and SBTi participation. However, qualitative results convincingly indicate that, in general, the willingness to act responsible and fair is an important factor for SBTi participation. This finding is in line with the study of Simões-Coelho and Figueira [2021], who argue that corporate incentives for climate action go beyond stakeholder pressures. Furthermore, confirm the finding of McKinsey & Company [2018], the qualitative output indicates that it is believed that participating in the SBTi helps protect the company against reputation and financial losses. Mainly, because validated and credible targets reduce the risk of being labeled as a greenwashing company. Moreover, qualitative results added another angle to the losses corporates are trying to prevent, covered in policy & transition risks. These transition risks can be mitigated by either setting science-based targets for the corporate, or lobbying against future policies, whereby the latter was also confirmed by Ceres [2022].

Albeit the intention to join the SBTi rather than lobbying against future policies seems to stem from good intentions to address risks, the literature argues that joining the SBTi might delay policy as well [Trexler and Schendler, 2015]. Arising from the idea that companies cannot solve climate change on their own, it is thereby argued that corporate voluntary efforts cannot substitute for public policy. Instead, policymakers should engage with the corporate communities that promote climate policy formation [Hayward et al., 2014], and corporates should lobby for science-based climate policies, something that is not done sufficiently yet by U.S. companies [Ceres, 2022]. Based on the credible findings of both literature studies and qualitative output, evidence is provided for risk mitigation being an important determining factor for participation in the SBTi. However, the unanticipated lack of quantitative proof suggests further progress in determining whether the proxy for endeavoring reputational and financial losses is not representative. Thereby, it is suggested to consider the limitations that will be discussed, and argue from the perspective of policy & transition risks in future research, since this research provides evidence on the importance of potential losses that go beyond reputation and finance.

6.1.5 Organizational Culture

Leadership

Our qualitative study emphasized the importance of a corporate's mission and vision on leadership when considering SBTi membership. From an external perspective, the CEO and the firm's strategy are determining whether the corporate is willing to be a leader, which is in line with the survey outcomes of Brønn and Vidaver-Cohen [2009]. This finding was found to be the most important determining factor to become a SBTi member according to one of our interviewees. From an internal perspective, the SBTi provides credible and guiding targets that help steer

the whole organization towards climate action. Thereby, providing clarity into target numbers which helps with internal communication with the board on corporate strategies and climate targets. Both relating to corporate culture and strategy, our findings provide evidence for the relevance of including organizational culture as a concept that covers determinants for SBTi participation and climate action in general. Thereby, implying that the framework of Simões-Coelho and Figueira [2021], which was based on a literature review, is limited in providing a complete overview of the relevant determining factors why corporates engage in sustainable development. This might be a result of their approach to using one search engine, excluding gray literature, in addition to the researchers' interpretation and their choice of keywords in the search.

Sustainability Committee

The second important and expected finding is related to Eccles et al. [2012], who stated that high sustainability firms, considered as firms that implemented voluntarily sustainability policies, are more common to have a stand-alone sustainability committee on board. In line with this reasoning was our quantitative result that a sustainability committee is positively and significantly related to SBTi participation, even when accounting for the sector- and firm fixed effects. The credibility of this result increases when looking into the interview outcomes, which suggest that a sustainability committee contributes to the decision to SBTi participation. The reason why this relationship exists according to the candidates aligns with extant literature. Namely, the main idea is that top management plays an important role in the sustainability decision-making and promotion [Linnenluecke and Griffiths, 2010; Zammuto et al., 2000]. Interview candidates confirmed that this is also the case when deciding to participate in the SBTi. Moreover, interviewees mentioned that leadership needs to be fed to make those sustainability decisions and that a sustainability committee connects all expertise in the organization that is needed to feed that top management. Our results thereby provide a more complete overview of the role of a sustainability committee in the decision to take certain climate action, in comparison with the extant literature that focuses on either quantitative or qualitative analyses.

Conservative corporate culture

Moreover, another interesting qualitative insight will be highlighted. It is found that a conservative corporate culture could have established a management approach that is focused on setting its science-based targets, without experiencing the need to validate these targets with, for instance, the SBTi. That being said, it is expected that the corporate culture in terms of progressiveness or conservativeness of the company could affect whether the company participates in the SBTi. From a corporate sustainability perspective, this was also found by Linnenluecke and Griffiths [2010], who argued that organizational conservatism acts as a barrier to organizational culture change. Another study points to organizations with a bureaucratic model, in which standard operating processes are hard to access or change through managerial control [Parker and Bradley, 2000]. Thereby, showing its relevance in investigating the influence of a conservative corporate culture on SBTi participation in future research. However, with a small sample size, caution must be applied, which is why further investigation on this topic is recommended for future work.

Incentive-based compensation

Furthermore, our results were less convincing for the following factors. To start with, the discussion of whether incentive-based compensation is an incentive to act and operate sustainably is ongoing in current literature [Eccles et al., 2012; Ikram

et al., 2019; Francoeur et al., 2017]. As a result, two contrary hypotheses were formulated (H8a and H8b). The quantitative results indicate no evidence. On the contrary, the qualitative results show that it is believed that incentives might help, but it will not necessarily push the decision to join the SBTi over the decision line. Thereby, it is believed that incentives are related to measuring and tracking progression, which stimulates action taking. The qualitative results thus tend towards not approving either of the hypotheses. Nevertheless, with an eye on the stewardship theory, the study of Francoeur et al. [2017] argued that managers will act responsibly and be motivated, even when not relying on incentives. Similarly, our qualitative results show that commitment from the top is fundamental, and that employees must have trust in these leadership commitments. We should thus trust in the CEO's responsible actions, even without compensation for those actions. To develop a full picture of the precise role of incentive-based compensation in the decision towards SBTi participation, additional studies are recommended that also highlight the stewardship theory. In addition, it is suggested to focus on the CEO's compensation for sustainability targets specifically, thus sustainability metrics, rather than focusing on the total incentive-based compensation as was done here. This was also done in studies such as Al-Shaer and Zaman [2019] and Park [2016]. Due to a lack of data availability, sustainability metrics were not included in the incentive-based compensation variable used in this research. We will discuss this in more detail later on.

Diversity

For the sake of brevity and based on the unconvincing qualitative findings, the gender ratio and nationality ratio of the board will be discussed in parallel. To start with, the quantitative results indicated that gender diversity is highly significant and negatively related to SBTi participation. Meaning, that more women on the board are beneficial for SBTi participation. This result was expected based on the research of Zaid et al. [2020] and Ruigrok et al. [2007], whom both argue for the pervasive influence of women on the decision-making process towards sustainable actions. The qualitative findings, on the other hand, provided evidence on the relationship between diversity and SBTi membership to a certain extent. Interviewees widely agreed on the fact that diversity is beneficial for decisions around climate action. However, no specific distinction could be made between gender and nationality diversity affecting SBTi participation. In contrast, studies of Zaid et al. [2020], Ruigrok et al. [2007], Ferrero-Ferrero et al. [2015] and Fuente et al. [2017] explicitly mentioned that a multinational board improves sustainable firm performance. This finding could unfortunately not be confirmed by quantitative results due to insignificant results of the main models, leaving the hypothesis unanswered. All in all, due to some promising findings, this study provides evidence for the fact that a gender-diverse board is related to SBTi membership and also could be the cause of joining the initiative. However, lacking evidence results in insufficient proof for assessing the association and causation regarding nationality diversity on the board. These rather disappointing findings could, however, be assessed by conducting interviews with experts in the field of corporate diversity. Thereby, suggesting a set-up for future research. It is, nevertheless, important to keep in mind that significant associations between diversity and SBTi participation could also be a result of a progressive corporate culture. To clarify, a company that has a progressive culture is likely to commit to both diversity and sustainability. Hence, a diverse community goes parallel to SBTi membership, rather than being the cause.

6.1.6 The effect of time on corporate determinants to participate in the SBTi

Another interesting observation in the quantitative results as indicated in Tables 5.4, 5.5, and 5.6 is that significant variables lose their statistical significance when incorporating time fixed effects in the models, except for the employee size and

Sigma Lean Six certificate in the second main model. Thereby, implying that models are sensitive to unobserved time effects. A potential reason for this effect could be found in the targeting strategy and overall journey of the SBTi in which several events took place. For instance, in 2019, the Business Ambition of 1,5°C was launched, in which a global coalition of UN agencies, business, and industry leaders partnered with the Race to Zero. This increased the awareness of companies by an urgent call to action. Furthermore, in 2021, the SBTi launched the Net-Zero standard in parallel to the COP26. Thereby, raising awareness of their existence among more companies in the corporate landscape [SBTi, 2022b]. This research is thus limited in the sense that it assesses associations between firm characteristics and SBTi membership, and other potential reasons, drivers, and motives that affect a corporate in the decision to participate. Except identified stakeholders such as the U.S. government in this research, our range of factors did not extensively assess potential other external factors that could change over time, and that could affect corporates in joining the SBTi. A reason for this can be found in the fact that our qualitative sample was relatively small which could result in several unidentified factors. In other words, theoretical saturation might not be reached. In addition, the variables in the statistical models are chosen by the researcher based on data availability within a certain time frame, which are both considered limitations. External pressures such as energy prices, legal procedures, or technological change are, on the other hand, assessed by the work of Lyon and Maxwell [1999]; Cetindamar [2007]; Okereke [2007]; Petersen et al. [2015]. However, most papers are limited to qualitative assessments in the form of surveys or literature reviews, and quantitative analyses, thereby excluding the potential of interview results. Nevertheless, these insights could be used as a starting point for further assessing external pressures for joining the SBTi in future work.

6.2 ASSESSING THE MIXED-METHOD APPROACH

Overall, the mixed-method approach allowed us to create a more complete overview of potential determinants to participate in the SBTi, thereby assessing firm characteristics and several reasons, drivers, and motives for a corporate to participate. In addition, the approach increased the generalizability and credibility of the outcomes and provided more detailed insights into quantitative outcomes. The extent to which this has increased the completeness, quality, and validity of the results will be discussed accordingly.

The mixed-methods approach seemed to be a good fit for this research, since both association between firm characteristics and SBTi participation, and causation between several factors and SBTi participation could be assessed. Thereby, not limiting ourselves to an exploratory study, as was seen in previous studies of Haddock-Fraser and Tourelle [2010], Brønn and Vidaver-Cohen [2009], Lyon and Maxwell [1999], and Okereke [2007]. These studies provided initial knowledge on potential determining factors for climate action, ICI participation, or voluntary initiative participation, but the discussion above showed that extant papers are often excluding detailed explanations of certain relationships or factors. In addition, a description of corporate actions or characteristics that might outweigh their reasons to take certain climate action is often lacking. For instance, our research showed that corporates in the energy sector prefer lobbying against policies over setting science-based targets, although these corporates do experience pressures from stakeholders. Furthermore, our results imply that the maturity of a sustainability program and the conservativeness of a company could also prevent a company from taking certain climate action, regardless of whether other motives are present. Albeit the relatively small sample size of our qualitative study which alone might not be sufficient to generalize the findings, the interviews thus revealed some unexpected interesting findings

and the most important outcomes. Concerning the latter, interviewees stressed the importance of the competitive element in joining the SBTi, the wide range of stakeholders that exert pressure, and a corporate's mission and vision on internal and external leadership.

Therefore, our lesson learned for future work on assessing reasons, motives, and drivers to take corporate climate action is to add semi-structured interviews to the research design, to discover unexpected factors that explain why a corporate may not take certain climate action, such as the influencing organizational and cultural aspects as mentioned in the previous paragraph. Also, to assess factors that could not be studied quantitatively, or that require a more detailed explanation. Another suggestion is to include gray literature when researching the corporate landscape since we found that these studies often provide up-to-date information on a corporate level.

From a quantitative perspective, our results showed the association between several firm characteristics and SBTi membership, by which an important result is that these associations are potentially influenced by sector differences, firm differences, and unobserved time effects. The econometric nature of the panel data regressions, in addition to our theoretical knowledge of the use of fixed effects when using the same sample over the period let us choose two main models that incorporated sector dummies, and additional time dummies. Moreover, these models allowed us to test our expectation that corporates in the Energy sector are the most likely to participate in the SBTi. However, one would prefer the firm fixed effects model now that we know that, compared to the sector fixed effects model, some variables do not remain stable when incorporating individual firm dummies. Thereby, implying that incorporating the unobserved sector effects is not sufficient. This could also be argued when looking at the adjusted R2, which increases when accounting for the firm fixed effects, thereby enhancing the goodness of fit. These insights let us suggest using the firm fixed effects model in future work, preferably with the inclusion of time dummies, and estimate a model for each sector separately. A similar structure can be found in the work of Degryse et al. [2012]. To this end, we advise increasing the sample size to maintain sufficient statistical power to test fixed effects.

Furthermore, in addition to the complementarity of the qualitative findings to the quantitative findings and vice versa, our qualitative results provided a detailed explanation of most of the quantitative results. Similar outcomes of quantitative and qualitative outcomes thereby amplified the generalizability of the results, as was seen for the results of H1, H4, H5, H7, and to a certain extent for H3 when not accounting for sector-specific effects (see Table 5.7). Results on employee size (H4) and the presence of a sustainability committee (H7) were the most credible since these results were also in line with expectations according to the extant literature on corporate climate action, ICIs participation, and voluntary initiative participation. Thereby, making the results more credible through triangulation. Results on sectors (H1) and efficiency (H5) were the most unexpected, but could be explained by the level of detail that could be provided by the qualitative analysis, and seemed to be due to the uniqueness of the SBTi. Results on a firm's innovativeness related to SBTi participation stress the impact of sector differences on the study, just as it emphasizes the impact of unobserved effects over time.

6.3 ASSESSING THE GUIDING FRAMEWORK ON CORPORATE DETERMINANTS TO PARTICIPATE IN THE SBTI

Overall, based on the foregoing discussion, it can be stated that the guiding framework of Simões-Coelho and Figueira [2021] that combined a multitude of concepts in both theoretical and field studies provided a good starting point for this research. To be more specific, the framework of Simões-Coelho and Figueira [2021] was build upon the framework of Windolph et al. [2014] by adding the concept of social insurance. To our knowledge, social insurance indeed seems a concept that is important to consider. Most importantly, it was found that companies participate in the SBTi not only to prevent the company against reputation, and financial, but also against a wide range of other losses covered by policy & transition risks. Participating in the SBTi thereby helps to guide against these policy and transition risks. However, guiding against those risks can also be achieved by lobbying against future policies, something that seems to disturb the SBTi. Sufficient insightful evidence was thus found that social insurance is an important concept to consider when assessing factors for SBTi participation, thereby in line with the studies of Simões-Coelho and Figueira [2021]; Windolph et al. [2014]; Okereke [2007]; Petersen et al. [2015] and Brønn and Vidaver-Cohen [2009].

In line with the expectations, the concept of legitimacy was also found important in this research. First, the convincing results showed evidence for the energy sector is not the most likely sector to join the SBTi, for business-to-business companies are more likely to join due to purchasing power, and for other stakeholder pressures that are relevant in the decision to join the SBTi. Thereby, finding consensus with Simões-Coelho and Figueira [2021]; Windolph et al. [2014]; Lyon and Maxwell [1999]; Okereke [2007]; Cetindamar [2007]; Fisher-Vanden and Thorburn [2011]; Reid and Toffel [2009]; Petersen et al. [2015] on legitimacy as important concept for SBTi participation.

Furthermore, light was shed on market success as one of the motive concepts. Results indicated that it is indeed an important motive to consider since the innovativeness of a company influences the possibility of SBTi participation. In addition, it became clear that global competitive pressures also function as a determinant to join the SBTi, thereby corroborating the studies of Simões-Coelho and Figueira [2021]; Windolph et al. [2014]; Petersen et al. [2015]; Brønn and Vidaver-Cohen [2009]; Ajour El Zein et al. [2019]; Montes et al. [2004]; Montresor and Vezzani [2016] that market success plays a role in SBTi participation.

Then, regarding internal improvement, it was widely believed that science-based target setting can increase efficiency in the firm. However, interviewees questioned whether a third party such as the SBTi is necessary for that process, to what extent the SBTi currently offers support to set the targets, and whether it is attractive to set those targets via the SBTi due to some identified burdens. To be more specific, the SBTi does not deliver support for the difficult scope 3 identifications and targets, their view on their target criteria has not always been shared by companies, and these criteria are continuously changing. Moreover, statistical analysis revealed a negative relationship between endeavoring maximizing efficiency and SBTi participation. These results tend to show that internal improvement is not necessarily a relevant determinant to participate in the SBTi. Nevertheless, our qualitative results suggest that science-based target setting as a means of climate action is believed to increase internal efficiency, which is following the research of Windolph et al. [2014]; Simões-Coelho and Figueira [2021]; Lozano [2015]; Steger et al. [2007]. Therefore, this research contributes to the literature by supporting evidence from previous observations on maximizing efficiency as a factor for corporate climate action; while

this not necessarily holds for SBTi participation. As was discussed, a reason for the latter could lie in the uniqueness of the SBTi which brings along some potential burdens to set targets via the initiative.

Lastly, this research added an angle to the existing framework, that of organizational culture. As expected, the analyses provided us with evidence that this concept is indeed important in assessing corporate determinants to participate in the SBTi. To specify, the layered structure of a company and its connectedness in a sustainability committee seems to influence potential SBTi participation, and the diversity of the board plays a significant role too. The qualitative research provided us with additional information on organizational culture beyond the formulated hypotheses, thereby strengthening the evidence that organizational culture is a valuable contribution to the existing framework. Namely, bureaucratic corporates with a conservative corporate culture seem to significantly influence the decision to join the SBTi. While some of the results need further research to improve the validity of the results, there is a strong indication that organizational culture is a fruitful addition to the framework of Simões-Coelho and Figueira [2021] when assessing corporate factors for SBTi participation. This was in line with our expectations, which were based on the work of Isensee et al. [2020]; Abbett et al. [2010]; Linnenluecke and Griffiths [2010]; Zammuto et al. [2000]; Eccles et al. [2012]; Ikram et al. [2019]; Francoeur et al. [2017]; Zaid et al. [2020]; Konadu et al. [2022]; Staniškienė and Stankevičiūtė [2018]; Bear et al. [2010]; Ben-Amar et al. [2017]; Ruigrok et al. [2007]; Ferrero-Ferrero et al. [2015]; Fuente et al. [2017].

6.4 CONTRIBUTIONS TO THE LITERATURE

First and foremost, this research that revolves around SBTi participation contributes to the inextensive body of academic literature on this popular initiative [Giesekam et al., 2021]. It thereby also enriches the extant literature on ICIs participation, voluntary initiative participation, and corporate climate action in general. It thereby strengthens academic proof of the role of corporate actors in delivering climate mitigation. Each of those fields will be further elaborated upon.

One of the assumptions that was made when reviewing the state-of-the-art literature on this topic (Chapter 3), was that literature on factors to participate in ICIs could be considered as relevant for this study since the SBTi is identified as ICI. The extant literature is, as was explained before, mainly focused on the influence of ICI participation on firm value. Nevertheless, some work was done on factors that elicit change in corporate ICI participation, which was mainly focused on shareholder resolutions and other stakeholder pressures Fisher-Vanden and Thorburn [2011]; Reid and Toffel [2009]. This research outcome, therefore, contributes to other angles that were not covered in previous research on ICIs participation. However, one should carefully consider the generalizability of this research to ICIs research in general. This refers to the uniqueness of the SBTi, which is considered to be the most prominent climate initiative in the ICIs landscape. As summarized in Section 2.5.2, the SBTi has a set of unique criteria for a corporate to join. As was reflected in this study, several criteria might influence the corporate to participate. For instance, the requirement to identify scope 3 emissions is considered to be a participation barrier to some, thereby potentially affecting the decision to join. Since these criteria will most likely differ from the criteria of other initiatives, the findings in this study could be generalized to a certain extent. Meaning that the significant positive relation between, for instance, employee size and SBTi participation is not necessarily relevant for other ICIs if those initiatives do not necessarily require human resources; but implies that some findings, such as the belief that a sustainability committee has a significant positive influence on SBTi participation, could also be

interpreted that way for other initiatives.

Similar views account for the field literature on voluntary initiative participation. Meaning, the results of this research can be generalized to other voluntary initiatives to a certain extent if one takes into account that the specific SBTi criteria could influence corporate determinants to participate. This research thereby contributes by supporting current evidence and by adding richness to the existing works of Cetindamar [2007]; Lyon and Maxwell [1999]; Brønn and Vidaver-Cohen [2009], which assess factors that affect corporate willingness and ability to involve in several voluntary initiatives. However, it should be considered that the SBTi revolves around the intention to reduce emissions, therefore requiring strict targets. Voluntary initiatives, on the other hand, range widely and might have different intentions. While it is believed that some accurate factors to joining a voluntary initiative could be extracted from this research, others might not be contributing to the state-of-the-art literature on voluntary initiative participation. For instance, the presence of a sustainability committee might be relevant for initiatives revolving around climate, while it does not necessarily stimulate corporates to participate in an initiative about diversity [Dover et al., 2020].

Lastly, we certainly enrich the literature on corporate climate action, which is related to the third assumption that was made in our literature review. To generalize findings, it should be noticed that SBTi participation is a form of corporate climate action, but corporate climate action is more than SBTi participation or (voluntary) ICIs participation alone. Again, the uniqueness of the SBTi could hinder the generalizability of the findings of this research to the broader context of climate action. Thereby, accounting for the criteria to participate in the SBTi, and the different perceptions of corporates on this initiative in specific. As was highlighted in the previous section, this research reveals a fifth valuable concept that was successfully added to the framework of Simões-Coelho and Figueira [2021]. The Organizational Culture concept arose from management and organization studies Crane [1995]; Jarnagin and Slocum [2007], and the work of Howard-Grenville and Gapp [2022] that pointed toward the recent ongoing discussion on an organization's culture that affects its sustainability practices. This angle was considered a relevant novel addition to the framework of Simões-Coelho and Figueira [2021], for which evidence is now found. One interesting observation should, however, be highlighted. The concept of Internal Improvement did not apply to SBTi participation as a matter of course, which raises the question of why the concept of Organizational Culture would necessarily apply to climate action. One obvious reason for this can be found in the fact that the literature that was assessed on organizational culture in this research related to climate action or corporate sustainability, not SBTi participation in specific. Another reason stems from the qualitative findings. More specifically, it was mentioned that a stand-alone sustainability committee drives decisions around *climate action*, incentive-based compensation helps in *action taking* by measuring and tracking progression, and diversity is always beneficial for *decisions around climate action*; hence not specifically focusing on the SBTi but climate action in general. From the aforementioned, we conclude that the factors to engage in climate action are more diverse than previously theorized by existing frameworks in the field.

6.5 LIMITATIONS

6.5.1 Quantitative analysis

First and foremost, there is a selection bias as only certain 2015 Fortune 500 companies were analyzed. This sample was selected based on data availability of this set of corporates in databases such as BoardEx and COMPUSTAT and the assumption

that these 500 companies are a good representative of the corporate landscape, but thereby excludes public companies and companies of different employee sizes, sales revenue, profit, which might have different reasons to join the SBTi. In addition, the restrictions as reflected in Figure 4.1 impose a survivorship bias on the sample, but were required to capture sufficient data on the independent variables as used in the model. To account for this limitation, the model build-up as shown in Figure 5.4 was chosen to provide insight into the effects of a reducing sample size. However, one limitation of this build-up is that it does not account for sector effects in the models that are tested previous to the main models, thereby ignoring potential unobserved sector effects. Fortunate, despite the relatively large reduction in sample size, the survivorship bias had no severe impact on the regression results. Nevertheless, to enhance the models' statistical power, for future research it is advised to choose a bigger sample size.

Furthermore, the representative data varies in its accuracy due to a lack of resources for data collection, and difficulties with collecting data within the time constraints. Therefore, the proxy for interest in efficiency maximization, the possession of a Sigma Lean Six certificate, was represented by data from the website of the International Lean Six Sigma Institute for certification data, which is not an official database or standard for management practices. Moreover, the data that was available for the Sigma Lean Six certification was time-invariant. Meaning, that no specific data on what year a company received the certificate was found. Therefore, not optimal for fixed effects regressions. For these reasons, it was preferred to use ISO 9001 data, which is defined as the international standard that specifies requirements for management systems including improving the efficiency of processes [ASQ, 2022], as a proxy for endeavoring maximizing efficiency. However, unavailable data led to the decision to use the Sigma Lean Six certificate as an indicator of whether a company is interested in efficiency maximization instead. Therefore, assessing the hypothesis with ISO data is recommended in future research.

With regard to other proxies that were used in the quantitative analysis, the proxies for sustainability and risk committee are also important to highlight concerning the limitations. Namely, in the data frame, an observation was marked with a 1 if a committee was present in that specific year. Thereby, linking SBTi participation in a certain year to whether a committee was present in that year. However, assessing whether such a committee was present in the years before SBTi membership could have added another perspective, since it is most likely that the decision to join the SBTi is made over the years. This could therefore be a good alternative to test in future research. Furthermore, the risk committee, used as a proxy for preventing reputational and financial losses, is limited in its representativeness. Namely, it was assumed here that a corporate only endeavors the prevention of reputational and financial losses when it has a stand-alone risk committee on board. However, putting effort into preventing those losses could, in practice, be achieved without a risk committee. Although qualitative results provided some indication on this topic, it is recommended to find another variable to assess the formulated hypothesis quantitatively.

Furthermore, one of the proxies for organizational culture, measured in incentive-based compensation, was limited in the sense that it did not test for compensation for sustainability target reaching in specific. For assessing the reasons why a corporate joins the SBTi, considered as a form of corporate climate action, it might be more interesting to test whether incentives that are specifically linked to a CEO's climate actions are related to SBTi participation. However, limited access to databases forced us to use the incentive-based compensation variable following the study of Francoeur et al. [2017].

Another limitation might lie in the choice of models. Although the choice of data format, model specifications, and functional forms were based on theory [Marques et al., 2010; Wooldridge, 2010; Greene, 2003; Lee, 2009; Das, 2019], one characteristic of the quantitative data was thereby ignored. Also known as the censored data problem, data in the sample behaves like data samples that are used to analyze firm survival. Meaning, that the sample period ends before most of the firms join the SBTi (potentially in the future). As a result, a censored data problem emerges for which other methods are needed than OLS or Logit regressions. Therefore, for future research, it is suggested to use a proportional hazard model to perform event history analysis on this sample, to account for this problem [López et al., 2017]. Unfortunately, this research did not allow to test this, and potential other models, due to limited time availability.

Furthermore, the main models were very sensitive to the introduction of time fixed effects and sensitive to firm fixed effects to a certain extent, thereby undermining the significant results that were shown in the model that incorporated sector-specific effects, and indicating that certain results were not robust. While some explanations for the sensitivity to time fixed effects were given, one could question whether sufficient power existed in the analysis to test for fixed effects in general. Thereby, different opinions exist. Namely, 50 groups with 5 cases per group are considered to be sufficient according to Kreft [1996], while 100 groups with 10 cases per group are required according to Hox et al. [2017]. To account for this potential limitation, it is suggested to consider a bigger sample size in future quantitative research on this topic.

Furthermore, the limitation exists that there might be other potential variables that are of interest for answering the main research question, which might be overlooked. This limitation often runs parallel to data and time availability. For this research, this meant that the different concepts were quantitatively tested based on a selected group of variables, chosen by one researcher with potentially biased views on the phenomena. Future research might allow for testing different measurements, preferably selected by a bigger group of researchers to improve the study's legitimacy. Thereby, also focusing on factors that relate to external pressures that affect a corporate to participate, which may vary over time, since this research mainly considered factors that are internal to corporates.

6.5.2 Qualitative analysis

To start with the literature review that was done at the beginning of the research, two important limitations can be highlighted. First, three assumptions were made based on the characteristics of the SBTi. While these assumptions were necessary to make since this research is pioneering in identifying motives for corporates to participate in the SBTi, these assumptions determined the search criteria and thereby the basis of the literature review. Second, combined with the first point, the selection and exclusion of articles resulted in an initial framework that was used as input for the quantitative and qualitative research, thereby also determining the hypotheses. In this process, some biased views from the researcher might have impacted this initial framework.

Moreover, some limitations of the empirical qualitative analysis can be identified. Starting with the sample selection, this research has selected a qualitative sample based on expert sampling and convenience sampling. Due to time constraints and difficulties with reaching the participants, these sampling methods were used instead of the intentional method of differences. Both sampling techniques bring along some limitations. Expert sampling, on the one hand, has the disadvantage of the selection of experts that is based on the researcher's judgment. This means that

the interviewees were considered to be an expert by the researcher, while the risk exists that their expertise is not sufficient to assess the questions accurately. Convenience sampling, on the other hand, has some great advantages such as quicker data collection and a readily available sample that is willing to participate. However, some disadvantages such as sampling bias and selection bias are present. Meaning, that the people that participated were subjectively chosen, and some potentially relevant subsets might have been excluded from the sample.

In addition, people in the sample were willing to participate, thereby excluding potential important information from corporates that were not willing to provide insights. Moreover, the interview candidates had different backgrounds, and expertise, and worked in different industries. As a result, comparing their insights and opinions is less valid than comparing visions of people who, for example, work for the same organization. On the other hand, this broad variety represents the population as a whole better, thus creating more generalizability. Nevertheless, one should consider the relatively small sample size of the qualitative analysis, thereby underrepresenting the total population. This implies that one should be careful with generalizing the results. However, as was previously discussed, the triangulation of the results provided more credible results.

Furthermore, in addition to generalizability, a limitation of the relatively small sample size is that it is harder to reach theoretical saturation. Means that at some point, no new ideas appeared among the interviewees. However, since the goal of the research was not necessary to collect all ideas, but to collect the most important ones, we could also assess salience, measured by the frequency of idea occurrence [Weller et al., 2018]. Taking this into account, we see that most ideas on the five motive concepts were shared by more than one interviewee. However, the adequacy of the sample size would simply improve by interviewing more experts in the field.

7 CONCLUSION

This thesis aimed at addressing why corporates join the SBTi. To this end, a mixed-method approach that entailed econometric statistical analysis and semi-structured interviews were conducted to assess the sub-questions that supported the main research question. This final chapter concludes the research by answering the main research question, providing the reader with implications, and policy recommendations, and summarizing fruitful areas for future work. Thereby, contributing to knowledge on SBTi participation and insights into the current corporate climate agenda, and understanding the driving forces for it. Before motivating the conclusions that can be derived from the research outcomes, we return to the main research question:

"Why do corporates participate in the Science Based Targets initiative?"

To summarize, the reasons why corporates join the most prominent climate initiative, the SBTi, arise from a broad variety of determinants. Overall, we found that *Legitimacy, Market Success, Social Insurance*, and *Organizational Culture* related factors affect a corporate in its decision to either participate or not participate in the SBTi; thereby unexpectedly excluding the theoretical fifth concept of *Internal Improvement*. While it was widely believed that science-based targets can improve efficiency in the firm, it remained debatable whether target setting via the SBTi is necessary for a corporate in order to reach that efficiency. In fact, corporates question whether target setting via the SBTi is attractive since its target criteria and current support towards corporates are rather hindering and insufficient.

While this research is by no means a complete overview of all individual factors related to each concept, simply because of time constraints and the scope of this study, evidence was found for the relevance of each of the four concepts. On the one hand, by providing evidence of associations between certain firm characteristics and SBTi membership. On the other hand, by assessing whether and how certain factors cause a firm to join the SBTi. Our main results can be summarized as follows.

The study's findings suggest that pressure of stakeholders such as investors, competitors, the U.S. government, employees, end-consumers, and purchasers is an important determinant for corporates to participate; whereby we have shown that joining the SBTi is currently mainly driven by purchasers rather than end-consumers in the U.S. Another important finding is the role of global competitive pressures in the decision to join the prominent SBTi, which is due to the fact that corporates want to maintain their frontrunning position, find peer benchmarking important, and are experiencing peer pressure within their sector. Furthermore, we prove that firms with larger employee sizes are more likely to participate in the SBTi, mainly because those firms have sufficient human resources that are required for setting and reaching targets, and because the SBTi targets those firms more often.

Another main finding is that a corporate's mission and vision of leadership is extremely important when considering SBTi membership. Externally, this means that joining the SBTi relies on whether the CEO and its firm's strategy want to be a leader in the field or not. Internally, establishing leadership on sustainability through the whole organization is encouraged by setting credible and guiding targets via the

SBTi, and the SBTi provides clarity into the target number which helps with the communication of targets to top management. Closely related to this finding is that our results convincingly show that the presence of a sustainability committee increases the probability that a firm joins the SBTi, since its central function helps to connect sustainability expertise in the organization to feed leadership and spread sustainability throughout the whole organization. These findings provide proof of the importance of a firm's organizational culture when assessing determinants for SBTi participation, and climate action in general.

In addition to our main findings and contradicting our expectations, we found that corporates in the energy sector are not the most likely to join the SBTi. In fact, while they are experiencing impressive stakeholder pressures, we found that these corporates are more willing to lobby against policies rather than setting science-based targets. Other influencing factors that might disturb the decision to join the SBTi were also identified, such as the maturity of a corporate's sustainability program, and a firm's conservative culture. In turn, we expect that a progressive culture might increase the chance that a firm will become a member. Furthermore, some interviewees believed that SBTi membership only serves to have a stamp on a corporate target. Thereby, implying that the SBTi is still labeled as a greenwashing practice by some corporates.

Furthermore, our work provides a slight indication of the importance of a firm's innovativeness, prevention of risks, and gender ratio on the board in deciding to join the SBTi. However, one should keep in mind that these factors could strongly differ between sectors, which is not always clearly reflected in current studies on determining factors for climate action, ICI, and voluntary initiative participation.

All in all, we discovered that a mixed-method sequential explanatory approach is a good fit for the type of study which aims to find relations between firm characteristics, motives, reasons, and drivers and SBTi membership, or climate action in general. Besides providing input for our interviews, this design allowed for increasing the generalizability and credibility of the results. Moreover, one main advantage of the mixed-method approach is that it allowed us to find the complementarity of association and causation between factors and SBTi membership. We experienced that extant literature is often limited to an exploratory research design that incorporates statistical analysis or questionnaires, thereby focusing on associations and ignoring potential relevant determining factors and disturbances of climate action. We, therefore, want to explicitly shed light on the added value of semi-structured interviews to this research and potential future work. From a quantitative perspective, we advise estimating firm fixed effects models for each sector separately, for which it is important to have a sample size that provides sufficient statistical power.

We can conclude that these research findings are a fruitful and pioneering basis for future research, as will be further elaborated upon below. While the results cannot be directly translated into very detailed nor quantitative recommendations, the following sections will draw general implications, and policy recommendations for corporates, the SBTi, and the U.S. government.

7.1 IMPLICATIONS

Our results point to several possible implications. One implication is that the number of SBTi members will grow further soon, since more and more corporates are willing to make their targets science-based, credible, and validated. In addition, more corporates will acknowledge the prominent character of the SBTi and envision the SBTi as a fair organization. It seems that the growth of the SBTi is approaching

the inflection point of a hockey stick growth and will soon enter the phase where growth becomes exponential. While most frontrunners might be a member already, it is expected that peer pressure within sectors will now play an increasingly important role in the expected cascade of firms joining the SBTi. Nevertheless, it will be apparent that firms that are willing to participate but are dealing with complex supply chains need more time to be able to join, because of the difficult scope 3 identification.

Furthermore, albeit one's intention might be to join the SBTi to 'receive a stamp' and 'belong to the club', it is expected that SBTi membership does not contribute to a firm's greenwashing practices in the long term. Namely, it requires investments for science-based targets to yield profit in the long term, firms need to disclose information, and the SBTi intervenes when a company is not progressing on the targets. Moreover, the SBTi has clear metrics, targets are aligned with science, and the initiative takes that seriously. Vague and generalized targets that are not validated, on the other hand, would imply greenwashing practices. However, it is not unimportant to mention that the SBTi should still improve on transparency and reporting quality requirements for corporates when their targets are approved.

We will thus most likely see a pattern of early adopters, the frontrunners, and late adopters, the followers or the firms that experience difficulties with emission identification. However, we should know there will always be a group of corporates that will not voluntarily participate. Although this group can also be affected by the SBTi's own exclusion criteria, an implication is that firms will mainly refuse to join because of their corporate culture that reflects its mission and vision, and the trust in their own sustainability practices and targets. However, we imply that SBTi members will environmentally and financially perform better on the long term, since emission reduction targets are continuously improved to align with the latest science, and pressures of stakeholders such as investors and their recognition for the SBTi will further increase.

7.2 POLICY RECOMMENDATIONS

All the aforementioned concluding words lead to a set of policy recommendations. This section will discuss these policy recommendations, structured in recommendations for corporates, the SBTi, and the government.

7.2.1 Corporates

- **Adopt standardized science-based targets.** The power of corporate science-based targets has been proven in several studies [Ruiz Manuel, 2021; Lui et al., 2021; World Resources Institute, 2021b], and very recent disclosure of the SBTi [SBTi, 2022b]. It is, however, beneficial to set science-based targets that are standardized. Not only to be able to compare business with competitors, but also for investors and decision-makers to decide more responsibly based on one standard. Thereby, a company has the power to stimulate collaboration toward more climate-friendly actions in the whole ecosystem. Due to the proven effectiveness of the initiative and its already prominent character, joining the SBTi can help in the process towards global standardization.
- **Enforce science-based target setting with purchasing power or frontrunning position in the sector.** We have shown that a company's purchasing power can stimulate businesses to set science-based targets, whereby the forcing effect is even stronger than when end-consumers request corporate climate action. Therefore, it is suggested to use this purchasing power to force suppliers to set

science-based targets too. Thereby, causing a cascade of target setting amongst supply chains. Furthermore, this cascade can also be triggered by taking the leading position in the sector. Meaning, that as a frontrunner, businesses have the power to stimulate others in the sector to set science-based targets too.

- **Enforce governmental climate policies and the acceleration thereof.** Of course, voluntary corporate climate action, such as joining the SBTi, is an important step towards closing the emission gap. However, one should realize that joining these voluntary programs could result in policy formation delays. Therefore, corporates should always lobby for science-based climate policies, such as policies on emission disclosure, even when forms of voluntary climate action are already present.
- **Join forces and empower others to calculate and share emissions in comprehensible language and data format.** The burden of scope 3 emission calculation is great, and thereby the burden of joining the SBTi. Forming networks to help each other calculate and share emissions is recommended. In addition, corporates should find a way to calculate and share emissions in comprehensible language, which is aligned with the data format of other corporates as well. This helps in communication and in the process of scope 3 emission reporting.
- **Reform organizational structure towards an ecosystem that enhances collaborative action and sustainable decision-making.** For leadership to make sustainable decisions, sustainability insights need to be fed into the top layer of the organization. Valuable insights require collaboration in the firm, by combining knowledge and expertise in all layers of the organization. To establish such a connection amongst different layers, it is recommended to have a stand-alone sustainability committee.

7.2.2 The SBTi

- **Reconsider targeting approach or align it with current gaps: focus on new sectors and conservative corporate cultures.** From the SBTi's latest webinar [SBTi, 2022b], it is known that the SBTi strives to reach a tipping point in which companies cannot deny joining the initiative. Based on the theory of the diffusion of innovation, this in turn requires 10-20% of global corporates to join. To what is known, the SBTi currently targets the largest companies where most emission reductions, thus the biggest impact, could be made. While this approach seems strategic, it is also advised to target corporates in an additional twofold of ways. First, the SBTi should focus on new sectors, since corporates tend to follow each other from a competitive point of view. Second, the SBTi should engage more with and spend more time on corporates having a conservative corporate culture, that does not experience the need to have a standardized target.
- **Respond to the expected growth.** We expect that more corporates in the corporate landscape will join at an accelerated pace, meaning that the SBTi itself must respond to that growth. To that end, the SBTi should be active in recruiting people who can validate targets, grow globally, and establish efficient processes within the organization. Since 2022, the SBTi is already responding to this growth by excluding the validation of more complex targets of energy corporates.
- **Join forces and enable corporate networks for scope 3 emission calculations.** As mentioned before, scope 3 emission calculations are one of the biggest burdens for corporates to join. Albeit big ambitions, scope 3 identification is likely to go beyond the company's knowledge and expertise. Therefore, to

attract and help corporates to join the initiative, the SBTi should establish a network of experts and corporates in which knowledge and practice could be exchanged. The bottom line here is that there are corporates in the landscape that like to hear from others how they achieve these practices.

- **Guide corporates in changing criteria.** The criteria to join the SBTi's change due to changing scenarios, which can be experienced as a burden by corporates. The SBTi should, therefore, inform companies of changing criteria and guide companies better when these criteria change.

7.2.3 The U.S. government

- **Adopt policies for compulsory emission identification to enhance emission calculation processes and science-based target setting.** To the knowledge of the author, both the SBTi and corporates are waiting for regulations around improving emission disclosure. It is therefore up to the government to accelerate the formulation of these policies to ensure that the emissions identification and calculation processes to set science-based targets will continue, especially when these processes go beyond a corporate's ability.
- **Engage with corporate communities that promote climate policy formation.** The government should prevent delays in policy formation because voluntary corporate climate action, such as joining the SBTi, is ongoing. Namely, corporate voluntary efforts cannot substitute for public policy and its impact. Therefore, the government should engage with the corporate landscape that promotes climate policy formation, to accelerate policy formation.
- **Integrate policies for sustainability committees, and purchasers.** It was indicated that corporates with a stand-alone sustainability committee were more likely to join the SBTi. Since a sustainability committee stimulates connection of different layers in the organization with the purpose of exchanging sustainability expertise and knowledge; the government should consider formulating legislation on an essential corporate sustainability committee for publicly traded companies, similar to the fact that audit committees are obligatory. Furthermore, since purchasing power is effective for causing a cascade of science-based target setting, legislation for purchasers when buying from suppliers should be tightened from a science-based target point of view.
- **Join forces with the SBTi to mitigate corporate policy and transition risk: inform and engage.** Corporates respond to announced future policies in two ways: they either act early by setting science-based targets, or they lobby against these policies. Since the former is most likely preferred by both the SBTi and the government, it is advised to join forces with the SBTi to mitigate the policy and transition risks of the latter by informing corporates on and guiding corporates in science-based target setting. Thereby, reducing the risk that a corporate will lobby against future governmental policies which in turn delays policy formation and science-based target setting. In addition, one interviewee suggested the government to harmonize with the corporates that are already involved in the SBTi, to punish them less hard when adapting policies.

7.3 FUTURE RESEARCH

Following the results and the limitations listed in the discussion section, a few avenues for future work arise. We can classify them into different research categories, such as purely future model-based recommendations, or broader recommendations

on relevant topics to assess in the future. In other words, all stages that were passed through in this thesis have the potential to be developed further, ranging from conceptualization to results. Hence, this section proposes some future work that can follow this study. However, it is by no means a complete overview of potential future work, but rather a short list of avenues that are considered relevant to highlight.

The first research area where future work is desirable relates to the methodology. First, to provide more precise input for the model specification, it is recommended to perform a systemic literature review rather than a narrative literature review, which includes academic and gray literature. Furthermore, to enhance the models' statistical power, it is suggested to choose a bigger sample size for the statistical analysis. Thereby, it is recommended to use survival analysis, to account for the data that is censored. Moreover, it is recommended to test the hypotheses with different proxies, to improve the strengths of the results. For instance, the proxy for endeavoring preventing financial and reputational losses should be chosen differently, since the results implied that the presence of a risk committee was perhaps not suitable to assess the formulated hypothesis. In addition, another proxy for end-consumer focus should be considered, since our quantitative outcomes were unexpected. Thereby, considering accurate data from official databases only to improve the internal validity of the quantitative data. Second, regarding the qualitative analysis, it is recommended to conduct more interviews whereby the selection of interviewees is based on, for instance, the method of differences, rather than expert sampling or convenience sampling. Thereby, increasing the validity of the results.

The second area of future work could lie in deepening knowledge on some important qualitative outcomes that were not very credible in this research due to lacking quantitative tests, or due to relatively few interviewees who mentioned the phenomena. For instance, how corporates with conservative cultures relate to SBTi participation, how the maturity of a corporate sustainability program relates to SBTi participation, or how other risks beyond reputation and financial losses influence SBTi participation. Furthermore, a deep dive could be made for the topic of diversity in terms of how gender and nationality diversity exactly influence the decision to join, preferably with diversity experts in the field. Moreover, there is sufficient room for assessing external factors that may affect SBTi participation, such as external pressures that could change over time.

Lastly, other interesting areas of future work could contribute to the overall gain in knowledge about participation in the SBTi. Since this study did incorporate sector-specific effects but did not examine the factors of corporates per sector specifically, it is highly suggested to analyze relationships between certain factors and SBTi participation in a certain sector, to be able to provide more detailed information for decision-making purposes for corporates, the SBTi, and the government. In addition, further study of differences between early and late SBTi adopters could be helpful to potentially find patterns in determinants, and steer companies toward SBTi membership in the future. Moreover, since the SBTi is a global operating initiative, it is suggested to extend this study to other continents or countries, since the generalizability of this study to other countries was moderate due to country-specific differences such as the sustainability awareness of end-consumers. Lastly, this study did not focus on the prioritization of determinants when corporates decide to participate in the initiative. However, this would be a fruitful area for future work to provide more targeted support for decision-making processes and policy formation.

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A GICS SECTOR DESCRIPTION

10	Energy
15	Materials
20	Industrials
25	Consumer Discretionary
30	Consumer Staples
35	Health Care
40	Financials
45	Information Technology
50	Communication Services
55	Utilities
60	Real Estate

Figure A.1: Overview of 11 sectors according to the Global Industry Classification Standard. An important point to notice is that the Energy sector comprises companies engaged in exploration & production, refining & marketing and storage & transportation of oil & gas and coal & consumable fuels; thereby, focusing on oil and gas drilling, production, transportation, and services.

B INTERVIEW CANDIDATES

Table B.1: Overview of interview candidates.

Interviewee	Type of organization	Interviewee role in organization	SBTi Member	Geographic location
A	Fortune 500 corporate (Industrials)	VP Global Sustainability	NO	United States
B	Fortune 500 corporate (Information Technology)	Worldwide Director, Global Sustainability	YES	United States
C	Fortune 500 corporate (Information Technology)	Sustainability & Datacenter Evangelist	YES	the Netherlands
D	SBTi	Corporate Engagement	-	United States
E	Fortune 500 corporate (Consumer Staples)	VP Global Sustainability	NO	United States
F	Fortune 500 corporate (Consumer Staples)	Global Sustainability Policy Manager	YES	United States
G	SBTi	Target analyst	-	United States
H	Consulting firm	Global Head of Climate Strategy	-	United States

C | INTERVIEW QUESTIONS

GENERAL QUESTIONS

1. I see ... became member of the SBTi in 20XX. Were you involved in the decision-making towards this membership?
2. Who, in terms of department or person, initially started the idea to get involved in the SBTi?
3. From your point of view, why would you think ... joined the SBTi?
4. In this decision-making process towards SBTi membership, are you aware of any hesitation that occurred back then?
5. So what, do you think, was the ultimate reason to start the SBTi target validation process?

SPECIFIC QUESTIONS

1. Your company is identified as ... sector. If you look around a bit, would you argue that ... and other corporates in this sector have increased likeliness to participate in the SBTi? Or not at all? Why?
2. I would consider ... a consumer-focused company. Would you too?
3. Would end-consumer focus be an incentive to join the SBTi? Because of stakeholder expectations. **If not**, why? This was also my finding. **If yes**, why?
4. Do you think a reason for SBTi membership could be to increase efficiency, or to optimize processes within the firm? **If not**, do you think SBTi targets are a burden rather than optimization increasing? **If yes**, why? Could there be a reason for this, for example because SBTi targets are a burden rather than optimization increasing?
5. Does ... have a separate risk committee? **If yes**, is this committee involved in climate action decision-making? And was it in a way related to SBTi participation? **If not**, would you say that a reason for SBTi membership is because the company puts effort in preventing reputational and financial losses (and SBTi is a way of mitigating those risks)?
6. Would you say that the bigger the company, the more likely it will join the SBTi? Can you come up with any reasons for this?
7. Would you say that innovation is required to achieve SBTi targets? **If yes**, do you think the level of innovativeness, implying the resources that are available to innovate, is a reason to participate or not in the SBTi? Or could there be another cause for this positive relationship? **If not**, I found a positive significant relation between innovativeness and the probability to become a SBTi member. Is there an underlying factor present that influences this relation?

8. In general, do you believe incentive-based compensation works for climate action? **If yes**, do you think it has stimulated ... to become SBTi member? Or, was a reason for SBTi participation to achieve the CEO's goals? Or could there be another cause? **If not**, why not?

9. The board composition of ... looks like: ... Would you say that the decision to join the SBTi is affected by the ratio men and women? In your personal experience, would you say an equal mix is beneficial for these types of decisions?

10. The results show that a higher ratio of women in the board leads to a higher probability of SBTi membership. Do you think there is a cause for this relationship?

11. The board composition of ... looks like: ... . Would you say that the decision to join the SBTi is affected by the ratio of nationalities? In your personal experience, would you say an equal mix is beneficial for these types of decisions?

12. Does ... have a separate sustainability committee? **If yes**, would you consider this committee to be relevant in climate action decision making within the firm? Were their visions the reason for SBTi participation? **If not**, do you think such a committee would have helped in the decision-making process towards SBTi participation?

Note that interview questions were slightly adjusted for firms that were not a member, and for the SBTi and consulting firms.

D RESULTS

The following results provide more detail to the results in the main text. For the sake of clarification, some variable names have been edited in the main report. Namely, *ln_emp* is replaced by *Employees*, *IBC_w* is replaced by *IncentiveBasedComp*, *AdvInt_w* is replaced by *AdvInt* and *MembershipYears* is replaced by *Membership*.

D.1 ANALYSIS RESULTS OF THE OLS REGRESSION ANALYSIS INCLUDING SECTOR DUMMIES

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.145[a]	.021	.020	.267

a. Predictors: (Constant), IntangibleAssetsRatio, ln_emp

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.036	2	2.018	28.299	<.001[b]
	Residual	186.610	2617	.071		
	Total	190.645	2619			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), IntangibleAssetsRatio, ln_emp

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.017	.015		-1.129	.259
	ln_emp	.022	.004	.102	5.120	<.001
	IntangibleAssetsRatio	.108	.026	.083	4.153	<.001

a. Dependent Variable: MembershipYears

Figure D.1: Analysis results of the OLS regression analysis including sector dummies - Detailed specification of column (A) in Table 5.4.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.150[a]	.023	.021	.267

a. Predictors: (Constant), LeanSix, IntangibleAssetsRatio, ln_emp

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.295	3	1.432	20.098	<.001[b]
	Residual	186.350	2616	.071		
	Total	190.645	2619			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), LeanSix, IntangibleAssetsRatio, ln_emp

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.013	.015		-.839	.402
	ln_emp	.023	.004	.108	5.371	<.001
	IntangibleAssetsRatio	.108	.026	.083	4.184	<.001
	LeanSix	-.020	.011	-.037	-1.908	.057

a. Dependent Variable: MembershipYears

Figure D.2: Analysis results of the OLS regression analysis including sector dummies - Detailed specification of column (B) in Table 5.4.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.146[a]	.021	.020	.247

a. Predictors: (Constant), RiskCommittee, LeanSix, ln_emp, IntangibleAssetsRatio

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.212	4	.803	13.155	<.001[b]
	Residual	147.983	2424	.061		
	Total	151.196	2428			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), RiskCommittee, LeanSix, ln_emp, IntangibleAssetsRatio

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.016	.015		-1.048	.295
	ln_emp	.021	.004	.106	5.063	<.001
	IntangibleAssetsRatio	.095	.026	.078	3.693	<.001
	LeanSix	-.018	.010	-.037	-1.785	.074
	RiskCommittee	-.007	.015	-.010	-.499	.618

a. Dependent Variable: MembershipYears

Figure D.3: Analysis results of the OLS regression analysis including sector dummies - Detailed specification of column (C) in Table 5.4.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.256[a]	.066	.061	.256

a. Predictors: (Constant), IBC_w, ln_emp, SustainabilityCommittee, NationalityMix, GenderRatio, LeanSix, RiskCommittee, IntangibleAssetsRatio

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.138	8	1.017	15.482	<.001[b]
	Residual	115.717	1761	.066		
	Total	123.855	1769			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), IBC_w, ln_emp, SustainabilityCommittee, NationalityMix, GenderRatio, LeanSix, RiskCommittee, IntangibleAssetsRatio

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.340	.076		4.459	<.001
	ln_emp	.018	.005	.078	3.260	.001
	IntangibleAssetsRatio	.099	.031	.079	3.203	.001
	LeanSix	-.027	.012	-.051	-2.179	.029
	RiskCommittee	-.009	.018	-.013	-.525	.599
	SustainabilityCommittee	.039	.022	.042	1.775	.076
	NationalityMix	.075	.033	.053	2.249	.025
	GenderRatio	-.564	.068	-.194	-8.309	<.001
	IBC_w	.080	.055	.034	1.465	.143

a. Dependent Variable: MembershipYears

Figure D.4: Analysis results of the OLS regression analysis including sector dummies - Detailed specification of column (D) in Table 5.4.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.263[a]	.069	.059	.309

a. Predictors: (Constant), IBC_w, NationalityMix, ln_emp, SustainabilityCommittee, GenderRatio, LeanSix, RiskCommittee, AdvInt_w, IntangibleAssetsRatio

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.639	9	.627	6.567	<.001[b]
	Residual	75.847	795	.095		
	Total	81.486	804			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), IBC_w, NationalityMix, ln_emp, SustainabilityCommittee, GenderRatio, LeanSix, RiskCommittee, AdvInt_w, IntangibleAssetsRatio

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.257	.143		1.795	.073
	ln_emp	.024	.010	.089	2.469	.014
	IntangibleAssetsRatio	.144	.056	.098	2.566	.010
	LeanSix	-.040	.023	-.063	-1.782	.075
	RiskCommittee	-.052	.037	-.052	-1.405	.161
	SustainabilityCommittee	.066	.041	.057	1.594	.111
	NationalityMix	.115	.060	.068	1.907	.057
	GenderRatio	-.563	.123	-.165	-4.574	<.001
	AdvInt_w	-.246	.431	-.021	-.570	.569
	IBC_w	.167	.094	.062	1.772	.077

a. Dependent Variable: MembershipYears

Figure D.5: Analysis results of the OLS regression analysis including sector dummies - Detailed specification of column (E) in Table 5.4.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.328[a]	.107	.087	.304

a. Predictors: (Constant), Real Estate [GIC_11], Materials [GIC_2], SustainabilityCommittee, Health Care [GIC_6], GenderRatio, Communication Services [GIC_9], LeanSix, Financials [GIC_7], IBC_w, ln_emp, NationalityMix, Industrials [GIC_3], Information Technology [GIC_8], AdvInt_w, IntangibleAssetsRatio, Consumer Staples [GIC_5], RiskCommittee, Consumer Discretionary [GIC_4]

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.750	18	.486	5.253	<.001[b]
	Residual	72.736	786	.093		
	Total	81.486	804			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), Real Estate [GIC_11], Materials [GIC_2], SustainabilityCommittee, Health Care [GIC_6], GenderRatio, Communication Services [GIC_9], LeanSix, Financials [GIC_7], IBC_w, ln_emp, NationalityMix, Industrials [GIC_3], Information Technology [GIC_8], AdvInt_w, IntangibleAssetsRatio, Consumer Staples [GIC_5], RiskCommittee, Consumer Discretionary [GIC_4]

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.179	.183		.977	.329
	AdvInt_w	-.226	.460	-.020	-.492	.623
	IntangibleAssetsRatio	.076	.065	.052	1.171	.242
	ln_emp	.029	.010	.106	2.883	.004
	LeanSix	-.064	.024	-.101	-2.664	.008
	RiskCommittee	.028	.054	.028	.518	.605
	SustainabilityCommittee	.089	.042	.077	2.150	.032
	IBC_w	.108	.096	.040	1.135	.257
	GenderRatio	-.465	.124	-.136	-3.755	<.001
	NationalityMix	.053	.062	.032	.848	.396
	Materials [GIC_2]	-.055	.153	-.023	-.360	.719
	Industrials [GIC_3]	.031	.132	.029	.235	.814
	Consumer Discretionary [GIC_4]	.037	.130	.056	.286	.775
	Consumer Staples [GIC_5]	.126	.134	.149	.945	.345
	Health Care [GIC_6]	.092	.134	.086	.689	.491
	Financials [GIC_7]	-.054	.139	-.051	-.391	.696
	Information Technology [GIC_8]	.222	.132	.212	1.688	.092
	Communication Services [GIC_9]	.003	.139	.002	.020	.984
	Real Estate [GIC_11]	.171	.179	.046	.957	.339

a. Dependent Variable: MembershipYears

Figure D.6: Analysis results of the OLS regression analysis including sector dummies - Detailed specification of column (F) in Table 5.4.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.492[a]	.242	.219	.281

a. Predictors: (Constant), Real Estate [GIC_11], YEAR_5, Materials [GIC_2], ln_emp, Communication Services [GIC_9], NationalityMix, Information Technology [GIC_8], Year_1, SustainabilityCommittee, IBC_w, Industrials [GIC_3], Health Care [GIC_6], YEAR_2, RiskCommittee, GenderRatio, LeanSix, YEAR_4, AdvInt_w, IntangibleAssetsRatio, YEAR_6, Consumer Staples [GIC_5], Financials [GIC_7], YEAR_3, Consumer Discretionary [GIC_4]

b. Dependent Variable: MembershipYears

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.740	24	.822	10.390	<.001[b]
	Residual	61.746	780	.079		
	Total	81.486	804			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), Real Estate [GIC_11], YEAR_5, Materials [GIC_2], ln_emp, Communication Services [GIC_9], NationalityMix, Information Technology [GIC_8], Year_1, SustainabilityCommittee, IBC_w, Industrials [GIC_3], Health Care [GIC_6], YEAR_2, RiskCommittee, GenderRatio, LeanSix, YEAR_4, AdvInt_w, IntangibleAssetsRatio, YEAR_6, Consumer Staples [GIC_5], Financials [GIC_7], YEAR_3, Consumer Discretionary [GIC_4]

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.182	.173		1.051	.294
	GenderRatio	.020	.123	.006	.163	.871
	NationalityMix	.003	.058	.002	.049	.961
	RiskCommittee	.052	.050	.053	1.040	.299
	SustainabilityCommittee	.046	.039	.040	1.197	.232
	LeanSix	−.057	.022	−.090	−2.574	.010
	ln_emp	.039	.009	.140	4.100	<.001
	IntangibleAssetsRatio	.026	.061	.018	.426	.670
	AdvInt_w	.328	.429	.029	.766	.444
	IBC_w	.109	.088	.040	1.228	.220
	Year_1	−.435	.047	−.487	−9.190	<.001
	YEAR_3	−.417	.046	−.475	−9.056	<.001
	YEAR_4	−.357	.045	−.408	−7.845	<.001
	YEAR_5	−.309	.045	−.355	−6.838	<.001
	YEAR_6	−.175	.045	−.200	−3.887	<.001
	YEAR_2	−.421	.047	−.477	−9.055	<.001
	Materials [GIC_2]	−.140	.141	−.058	−.991	.322
	Industrials [GIC_3]	−.043	.122	−.040	−.352	.725
	Consumer Discretionary [GIC_4]	−.032	.121	−.047	−.261	.794
	Consumer Staples [GIC_5]	.078	.124	.092	.629	.530
	Health Care [GIC_6]	.037	.124	.034	.295	.768
	Financials [GIC_7]	−.144	.129	−.136	−1.119	.264
	Information Technology [GIC_8]	.163	.122	.155	1.339	.181
	Communication Services [GIC_9]	−.078	.129	−.058	−.602	.547
	Real Estate [GIC_11]	.112	.166	.030	.677	.499

a. Dependent Variable: MembershipYears

Figure D.7: Analysis results of the OLS regression analysis including sector dummies - Detailed specification of column (G) in Table 5.4.

D.2 ROBUSTNESS CHECK

D.2.1 Analysis results of the OLS regression analysis with fixed effects

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.651[a]	.424	.297	.267

a. Predictors: (Constant), COMP_393, COMP_84, COMP_72, COMP_34, COMP_21, COMP_353, COMP_311, COMP_173, COMP_135, COMP_379, COMP_304, COMP_280, COMP_238, COMP_223, COMP_143, COMP_67, COMP_51, COMP_370, COMP_367, COMP_354, COMP_305, COMP_249, COMP_242, COMP_234, COMP_228, COMP_214, COMP_209, COMP_177, COMP_175, COMP_156, COMP_124, COMP_107, COMP_29, COMP_11, COMP_391, COMP_390, COMP_387, COMP_381, COMP_380, COMP_377, COMP_369, COMP_360, COMP_342, COMP_340, COMP_333, COMP_330, COMP_321, COMP_313, COMP_299, COMP_290, COMP_274, COMP_270, COMP_269, COMP_263, COMP_251, COMP_245, COMP_243, COMP_241, COMP_232, COMP_231, COMP_219, COMP_218, COMP_205, COMP_204, COMP_200, COMP_187, COMP_183, COMP_182, COMP_179, COMP_169, COMP_166, COMP_165, COMP_162, COMP_155, COMP_149, COMP_123, COMP_120, COMP_116, COMP_112, COMP_99, COMP_95, COMP_94, COMP_83, COMP_76, COMP_71, COMP_66, COMP_57, COMP_56, COMP_32, COMP_23, COMP_20, COMP_15, COMP_10, COMP_264, COMP_216, COMP_383, COMP_376, COMP_374, COMP_355, COMP_349, COMP_346, COMP_334, COMP_327, COMP_315, COMP_308, COMP_298, COMP_297, COMP_296, COMP_288, COMP_287, COMP_248, COMP_225, COMP_197, COMP_194, COMP_189, COMP_180, COMP_172, COMP_167, COMP_152, COMP_140, COMP_126, COMP_106, COMP_122, COMP_114, COMP_92, COMP_91, COMP_90, COMP_89, COMP_74, COMP_64, COMP_50, COMP_43, COMP_42, COMP_13, COMP_12, COMP_8, COMP_7, IBC_w, GenderRatio, SustainabilityCommittee, NationalityMix, IntangibleAssetsRatio, RiskCommittee, AdvInt_w, ln_emp

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.518	145	.238	3.340	<.001[b]
	Residual	46.968	659	.071		
	Total	81.486	804			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), COMP_393, COMP_84, COMP_72, COMP_34, COMP_21, COMP_353, COMP_311, COMP_173, COMP_135, COMP_379, COMP_304, COMP_280, COMP_238, COMP_223, COMP_143, COMP_67, COMP_51, COMP_370, COMP_367, COMP_354, COMP_305, COMP_249, COMP_242, COMP_234, COMP_228, COMP_214, COMP_209, COMP_177, COMP_175, COMP_156, COMP_124, COMP_107, COMP_29, COMP_11, COMP_391, COMP_390, COMP_387, COMP_381, COMP_380, COMP_377, COMP_369, COMP_360, COMP_342, COMP_340, COMP_333, COMP_330, COMP_321, COMP_313, COMP_299, COMP_290, COMP_274, COMP_270, COMP_269, COMP_263, COMP_251, COMP_245, COMP_243, COMP_241, COMP_232, COMP_231, COMP_219, COMP_218, COMP_205, COMP_204, COMP_200, COMP_187, COMP_183, COMP_182, COMP_179, COMP_169, COMP_166, COMP_165, COMP_162, COMP_155, COMP_149, COMP_123, COMP_120, COMP_116, COMP_112, COMP_99, COMP_95, COMP_94, COMP_83, COMP_76, COMP_71, COMP_66, COMP_57, COMP_56, COMP_32, COMP_23, COMP_20, COMP_15, COMP_10, COMP_264, COMP_216, COMP_383, COMP_376, COMP_374, COMP_355, COMP_349, COMP_346, COMP_334, COMP_327, COMP_315, COMP_308, COMP_298, COMP_297, COMP_296, COMP_288, COMP_287, COMP_248, COMP_225, COMP_197, COMP_194, COMP_189, COMP_180, COMP_172, COMP_167, COMP_152, COMP_140, COMP_126, COMP_106, COMP_122, COMP_114, COMP_92, COMP_91, COMP_90, COMP_89, COMP_74, COMP_64, COMP_50, COMP_43, COMP_42, COMP_13, COMP_12, COMP_8, COMP_7, IBC_w, GenderRatio, SustainabilityCommittee, NationalityMix, IntangibleAssetsRatio, RiskCommittee, AdvInt_w, ln_emp

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.283	.365		.776	.438
	GenderRatio	-.945	.170	-.277	-5.567	<.001
	NationalityMix	.227	.139	.135	1.638	.102
	RiskCommittee	-.157	.134	-.159	-1.179	.239
	SustainabilityCommittee	.159	.072	.137	2.199	.028
	ln_emp	.052	.064	.191	.826	.409
	AdvInt_w	-.156	1.918	-.014	-.081	.935
	IBC_w	.050	.119	.018	.418	.676
	IntangibleAssetsRatio	.064	.190	.043	.336	.737

Figure D.8: Analysis results of the fixed effects regression analysis including - Detailed specification of column (H) in Table 5.5. Firm dummies are not displayed in the coefficients table.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.734[a]	.539	.432	.240

a. Predictors: (Constant), COMP_393, YEAR_5, COMP_391, COMP_390, COMP_387, COMP_381, COMP_84, COMP_72, COMP_34, COMP_21, COMP_380, COMP_377, COMP_369, COMP_370, COMP_367, COMP_305, COMP_249, COMP_242, COMP_353, COMP_228, COMP_214, COMP_209, COMP_175, COMP_156, COMP_124, COMP_29, COMP_11, COMP_379, COMP_304, COMP_238, COMP_223, COMP_143, COMP_67, COMP_360, COMP_342, COMP_340, COMP_173, COMP_135, COMP_333, COMP_330, COMP_321, COMP_313, COMP_299, COMP_280, COMP_51, COMP_290, COMP_274, COMP_270, COMP_269, COMP_263, COMP_251, COMP_245, COMP_243, COMP_241, COMP_311, COMP_232, COMP_231, COMP_219, COMP_218, COMP_205, COMP_204, COMP_200, COMP_187, COMP_183, COMP_182, COMP_179, COMP_169, COMP_166, COMP_165, COMP_162, COMP_354, COMP_234, COMP_177, COMP_107, COMP_155, COMP_149, COMP_123, COMP_120, COMP_116, COMP_112, COMP_99, COMP_95, COMP_94, COMP_83, COMP_76, COMP_71, COMP_66, COMP_57, COMP_56, COMP_32, COMP_23, COMP_20, COMP_15, COMP_10, COMP_383, COMP_376, COMP_374, COMP_197, COMP_355, COMP_349, COMP_346, COMP_334, COMP_327, COMP_315, COMP_308, COMP_298, COMP_297, COMP_296, COMP_288, COMP_287, COMP_264, COMP_248, COMP_225, COMP_216, COMP_194, COMP_189, COMP_180, COMP_172, COMP_167, COMP_152, COMP_140, YEAR_4, COMP_126, COMP_122, COMP_114, COMP_106, COMP_92, COMP_91, COMP_90, COMP_89, COMP_74, YEAR_2, COMP_64, COMP_50, COMP_43, COMP_42, YEAR_3, COMP_13, COMP_12, Year_1, COMP_8, COMP_7, IBC_w, YEAR_6, GenderRatio, SustainabilityCommittee, NationalityMix, IntangibleAssetsRatio, RiskCommittee, AdvInt_w, ln_emp

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.910	151	.291	5.053	<.001[b]
	Residual	37.576	653	.058		
	Total	81.486	804			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), COMP_393, YEAR_5, COMP_391, COMP_390, COMP_387, COMP_381, COMP_84, COMP_72, COMP_34, COMP_21, COMP_380, COMP_377, COMP_369, COMP_370, COMP_367, COMP_305, COMP_249, COMP_242, COMP_353, COMP_228, COMP_214, COMP_209, COMP_175, COMP_156, COMP_124, COMP_29, COMP_11, COMP_379, COMP_304, COMP_238, COMP_223, COMP_143, COMP_67, COMP_360, COMP_342, COMP_340, COMP_173, COMP_135, COMP_333, COMP_330, COMP_321, COMP_313, COMP_299, COMP_280, COMP_51, COMP_290, COMP_274, COMP_270, COMP_269, COMP_263, COMP_251, COMP_245, COMP_243, COMP_241, COMP_311, COMP_232, COMP_231, COMP_219, COMP_218, COMP_205, COMP_204, COMP_200, COMP_187, COMP_183, COMP_182, COMP_179, COMP_169, COMP_166, COMP_165, COMP_162, COMP_354, COMP_234, COMP_177, COMP_107, COMP_155, COMP_149, COMP_123, COMP_120, COMP_116, COMP_112, COMP_99, COMP_95, COMP_94, COMP_83, COMP_76, COMP_71, COMP_66, COMP_57, COMP_56, COMP_32, COMP_23, COMP_20, COMP_15, COMP_10, COMP_383, COMP_376, COMP_374, COMP_197, COMP_355, COMP_349, COMP_346, COMP_334, COMP_327, COMP_315, COMP_308, COMP_298, COMP_297, COMP_296, COMP_288, COMP_287, COMP_264, COMP_248, COMP_225, COMP_216, COMP_194, COMP_189, COMP_180, COMP_172, COMP_167, COMP_152, COMP_140, YEAR_4, COMP_126, COMP_122, COMP_114, COMP_106, COMP_92, COMP_91, COMP_90, COMP_89, COMP_74, YEAR_2, COMP_64, COMP_50, COMP_43, COMP_42, YEAR_3, COMP_13, COMP_12, Year_1, COMP_8, COMP_7, IBC_w, YEAR_6, GenderRatio, SustainabilityCommittee, NationalityMix, IntangibleAssetsRatio, RiskCommittee, AdvInt_w, ln_emp

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.222	.330		.672	.502
	AdvInt_w	.102	1.731	.009	.059	.953
	IntangibleAssetsRatio	.165	.172	.113	.965	.335
	ln_emp	-.010	.058	-.038	-.180	.857
	RiskCommittee	-.118	.120	-.119	-.978	.328
	SustainabilityCommittee	.062	.066	.053	.937	.349
	IBC_w	.034	.107	.013	.322	.748
	GenderRatio	.149	.181	.044	.821	.412
	NationalityMix	-.058	.127	-.035	-.457	.648
	Year_1	-.469	.045	-.525	-10.411	<.001
	YEAR_2	-.464	.044	-.525	-10.614	<.001
	YEAR_3	-.456	.043	-.519	-10.682	<.001
	YEAR_4	-.393	.041	-.450	-9.553	<.001
	YEAR_5	-.335	.041	-.384	-8.278	<.001
	YEAR_6	-.210	.040	-.239	-5.202	<.001

Figure D.9: Analysis results of the fixed effects regression analysis including - Detailed specification of column (I) in Table 5.5. Firm dummies are not displayed in the coefficients table.

D.2.2 Analysis results of the logit regression analysis including sector dummies

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	38.294	9	<.001
	Block	38.294	9	<.001
	Model	98.835	18	<.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	473.332[a]	.116	.227

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.757	8	.216

Classification Table[a]

			Predicted MembershipYears		
	Observed		0	1	Percentage Correct
Step 1	MembershipYears	0	712	1	99.9
		1	85	7	7.6
	Overall Percentage				89.3

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	GenderRatio	-5.947	1.386	18.422	1	<.001	.003
	NationalityMix	.657	.628	1.094	1	.296	1.928
	LeanSix	-.617	.262	5.552	1	.018	.540
	RiskCommittee	.103	.613	.028	1	.867	1.108
	SustainabilityCommittee	.792	.411	3.724	1	.054	2.208
	ln_emp	.302	.116	6.824	1	.009	1.353
	IBC_w	2.044	1.501	1.856	1	.173	7.722
	AdvInt_w	-3.077	4.786	.413	1	.520	.046
	IntangibleAssetsRatio	1.077	.714	2.275	1	.131	2.935
	Materials [GIC_2]	-.444	19061.968	.000	1	1.000	.641
	Industrials [GIC_3]	18.104	15842.725	.000	1	.999	72880938.2
	Consumer Discretionary [GIC_4]	18.409	15842.725	.000	1	.999	98860971.6
	Consumer Staples [GIC_5]	19.109	15842.725	.000	1	.999	198958463
	Health Care [GIC_6]	18.858	15842.725	.000	1	.999	154884051
	Financials [GIC_7]	-.220	16425.996	.000	1	1.000	.802
	Information Technology [GIC_8]	19.905	15842.725	.000	1	.999	441223249
	Communication Services [GIC_9]	17.547	15842.725	.000	1	.999	41731099.3
	Real Estate [GIC_11]	19.900	15842.725	.000	1	.999	439169335
	Constant	-19.696	15842.725	.000	1	.999	.000

a. Variable(s) entered on step 1: Materials [GIC_2], Industrials [GIC_3], Consumer Discretionary [GIC_4], Consumer Staples [GIC_5], Health Care [GIC_6], Financials [GIC_7], Information Technology [GIC_8], Communication Services [GIC_9], Real Estate [GIC_11].

Figure D.10: Analysis results of the logit regression analysis including sector dummies - Detailed specification of Table 5.6.

D.3 SUB-GROUP ANALYSIS FOR EARLY AND LATE ADOPTERS

Model Summary

JoinerType	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1	.444[a]	.197	.090	.479
2	1	.296[b]	.088	.033	.332

a. Predictors: (Constant), Information Technology [GIC_8], GenderRatio, IBC_w, IntangibleAssetsRatio, AdvInt_w, RiskCommittee, Industrials [GIC_3], SustainabilityCommittee, NationalityMix, LeanSix, Health Care [GIC_6], ln_emp, Consumer Staples [GIC_5]

b. Predictors: (Constant), Real Estate [GIC_11], IntangibleAssetsRatio, Communication Services [GIC_9], SustainabilityCommittee, Information Technology [GIC_8], Industrials [GIC_3], RiskCommittee, IBC_w, AdvInt_w, NationalityMix, Health Care [GIC_6], LeanSix, GenderRatio, ln_emp, Consumer Staples [GIC_5]

ANOVA[a]

JoinerType	Model		Sum of Squares	df	Mean Square	F	Sig.
1	1	Regression	5.476	13	.421	1.836	.048[b]
		Residual	22.253	97	.229		
		Total	27.730	110			
2	1	Regression	2.667	15	.178	1.609	.072[c]
		Residual	27.745	251	.111		
		Total	30.412	266			

a. Dependent Variable: MembershipYears

b. Predictors: (Constant), Information Technology [GIC_8], GenderRatio, IBC_w, IntangibleAssetsRatio, AdvInt_w, RiskCommittee, Industrials [GIC_3], SustainabilityCommittee, NationalityMix, LeanSix, Health Care [GIC_6], ln_emp, Consumer Staples [GIC_5]

c. Predictors: (Constant), Real Estate [GIC_11], IntangibleAssetsRatio, Communication Services [GIC_9], SustainabilityCommittee, Information Technology [GIC_8], Industrials [GIC_3], RiskCommittee, IBC_w, AdvInt_w, NationalityMix, Health Care [GIC_6], LeanSix, GenderRatio, ln_emp, Consumer Staples [GIC_5]

Coefficients[a]

JoinerType	Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	1	(Constant)	.250	.962		.260	.796
		GenderRatio	−1.770	.638	−.282	−2.774	.007
		NationalityMix	.596	.421	.189	1.415	.160
		IntangibleAssetsRatio	.347	.437	.143	.793	.430
		ln_emp	.049	.058	.119	.848	.398
		IBC_w	.995	.681	.140	1.461	.147
		AdvInt_w	−.225	2.400	−.013	−.094	.926
		RiskCommittee	−.088	.189	−.053	−.465	.643
		SustainabilityCommittee	.339	.177	.211	1.922	.057
		LeanSix	.094	.122	.091	.768	.445
		Industrials [GIC_3]	.049	.281	.022	.174	.862
		Consumer Staples [GIC_5]	.306	.168	.262	1.820	.072
		Health Care [GIC_6]	−.065	.223	−.041	−.293	.770
		Information Technology [GIC_8]	.272	.151	.241	1.803	.074
2	1	(Constant)	.993	.294		3.374	<.001
		GenderRatio	−1.086	.276	−.294	−3.937	<.001
		NationalityMix	.011	.103	.007	.107	.915
		IntangibleAssetsRatio	−.034	.116	−.021	−.296	.767
		ln_emp	−.012	.024	−.039	−.481	.631
		IBC_w	.079	.182	.029	.433	.665
		AdvInt_w	−.860	.802	−.080	−1.073	.285
		RiskCommittee	−.277	.105	−.183	−2.632	.009
		SustainabilityCommittee	.177	.102	.117	1.737	.084
		LeanSix	−.018	.050	−.027	−.370	.712
		Industrials [GIC_3]	−.033	.097	−.025	−.336	.737
		Consumer Staples [GIC_5]	−.062	.071	−.083	−.872	.384
		Health Care [GIC_6]	−.054	.079	−.062	−.676	.500
		Information Technology [GIC_8]	−.041	.099	−.030	−.414	.680
		Communication Services [GIC_9]	−.091	.093	−.069	−.982	.327
		Real Estate [GIC_11]	.043	.147	.019	.292	.770

a. Dependent Variable: MembershipYears

Figure D.11: Analysis results of the sub-group regression analysis for early and late adopters - JoinerType 1 represent the early adopters (2015-2019), and JoinerType 2 represents the late adopters (2020-2021).

E | INTERVIEW NOTES

E.1 INTERVIEWEE A

1. We are considering SBTi membership
2. Scope 3 is the big challenge with thousands of suppliers and customers in too many industries. 15 categories need to be considered.
3. You want to have the feeling that you are doing something for the company. Therefore, you want to sort everything out first. Being a responsible business is an important thing.
4. She gets it that scope 3 must be included.
5. As a large organization they want to lead, they want to push.
6. Key things: having the data and ability to have insights in the decisions that are made by customers and the ability to influence them perhaps.

Stakeholders (legitimacy)

1. Employees are curious and involved in technical issues. They want to work for a company that has values that are similar to theirs (talent attraction) internally
2. End users/big customers also have goals/expectations/request investors –¿ externally
3. It is quite a broad set of stakeholders
4. EU is leading
5. It varies how a customer looks at sustainability. The trend is going towards bolder/bigger actions. It kind of depends on the country of the customer. Not all customers are the same.
6. People are more aware after the COVID crisis: we must take care of things. The societal level of things. That surprised me.

Innovation

1. Innovation is required to reach SBTi targets. Even scope 1 and 2. Collaborative efforts that involve innovations, and new solutions.

Company size

1. Customer/investor/employee stakeholder is more influential than just the size.
2. When you are bigger you are more of interest for those stakeholders which urge you to do things. Increase momentum, increase that shift.
3. Whoever is a leader. It is more because of the push from the stakeholder that is probably of the biggest influence.

Organizational culture of the company

1. Gender and nationality: diversity in a lot of different angles is always good.
2. It is a leadership decision. Our CEO especially. He has got to decide that we are making a commitment and that we have all the information to find this way forward.
3. Sustainability and other experts need to give him this information. One level below the CEO, the board, are critical also. The board is very much pushing on what are we doing, are we doing the things that we should be doing. Not necessarily pushing for SBTi. They might be more specific in the area of climate and lean into the areas where we could make an impact.

Sustainability Committee

1. It would be tough if you don't have such a committee, or different working groups that feed into different committees and board/CEO. Having those numbers of layers is really important. When you look at all the pieces that affect all those different categories for SBTi. It is like every function has a role to play. So, if you don't have a way for that to come together in some way, and everyone is in their more functional silos, I think that would be really challenging to be able to do that. You need functional depth and expertise, but you need some ways that that can come together and connect, and then feed into leadership and for them to make it possible to make certain decisions.

Firm efficiency

1. I'm sure we have some gains to do things more efficient internally. The biggest impact would be having a clear milestone that is set. If we set something, we are going to do that. We are going to go down that path. Biggest benefit would be that very clear alignment on the goal and the time. Then, the people from all the different working groups will line up and will be working towards that goal. If you don't have those 2030/2040/2050 goals (longer term) and interim goals, then it might not happen. You must move the whole organization towards that goal, so you need that goal to be set with timing. It gives clarity for what is needed.

Incentive-based compensation

1. It could help. When something is measured/tracked, there is more likelihood of things happening from that.
2. Our top leadership do have ESG expectations that are on their performance.
3. It is a good thing. I don't know if it's the only thing for something like this to push it over the decision line, but I do think that giving visibility to those performances are good. And not just financials. It is great that we achieve financial goals, but how we do that matters.

Concluding words

1. Missing data is the biggest issue for scope 3. Measuring point, visibility and access of data. Otherwise, people would do this, if it was more direct and clearer.
2. Solutions that help companies identify these kinds of pieces that are going to create on how we going to move forward. Who do we think could help us do this? We need a network stitched together on how we going to do it. It is a big hurdle now, the unavailable data.
3. SBTi might help in this process. They don't have the solutions for this. They are more about the verification process.

E.2 INTERVIEWEE B

1. XX has considered it. They investigated the criteria.
2. It is the job of the corporate staff (sustainability track) to be aware of different initiatives.
3. Why would you think corporates would join? I don't know why companies decide to join? Why does a company need that?
4. We can do it ourselves.
5. Why do you want somebody to put a stamp on your goal? (Use it as a check-box)
6. Why this initiative in particular? You want to be fair and critical. Not just 'I am in the club'. These are very superficial motivations. don't know it's just a hurdle. We as engineers know how to set the goals. We don't need a consultant. Others want someone to help them with setting a goal.
7. XX has a science-based target.
8. Downside: these initiatives are so proactive with making changes. They sign up to something and then keep on changing their criteria. It is not per se a hurdle, but what does it do that help improving the environment?
9. What does joining the initiative bring to the environment?

Scope 3

1. Struggling with scope 3 is understandable, but I think scope 3 is not science-based. So she is sceptic about whether scope 3 is science. It is someone else's emissions. The only thing mother earth feels are scope 1 emissions. Therefore, scope 3 doesn't match science. Companies that say scope 3 is difficult are very honest with you. Scope 3 is an ideology.
2. We say: every entity must take action to reduce their emissions. At the end of the day we can assign all we want. We don't have the ability to actually reduce others emissions. That is our opinion.
3. SBTi has a different view on that.
4. Rephrase: it is scope 3. There is no one size fits all approach. SBTi is just one approach. It is quite arbitrary. One may draw the conclusions that you can have that stamp. Hopefully you find out that not having the stamp does not mean a company does not have a science-based target.

1. We do look at the initiatives. Quantifying scope 3 is impossible for some sectors. Think through it and decide what path you want to o down. Do we want to do a guestimate and get the stamp?
2. You can work with suppliers which is softer than having a numerical goal.

Initiatives

1. We do look at the initiatives. Quantifying scope 3 is impossible for some sectors. Think through it and decide what path you want to o down. Do we want to do a guestimate and get the stamp?
2. You can work with suppliers which is softer than having a numerical goal.

Maturity of the company's sustainability

1. There is little value of joining from a maturity standpoint. We have mature program. We don't jump on the bandwagon just because it is popular.

How do we set the goals?

1. Conserving energy is good for the business. We set goals from engineering approach. Management system centric. As leaders in the space, we want environmental management. We are system dependent not people dependent. What are the business intersections to the climate?
2. If we have a goal, we focus on actions. From a management standpoint, XX is well managed. We need to think critical. If thinking make sense, you got approval.
3. People always ask why we are not part of something.
4. For IT it is easier to set targets. We are not a manufacturing company. Ability to join is much easier than other companies. People like to belong. There is a snowball effect. Big companies are jumping in.
5. How do you set a goal when you don't know the baseline? Growth assumptions with a macro level can help you directionally. But you can't use estimates to set a numerical goal. It's a leap to do that.
6. It is sad that people look you up at the SBTi website and they're surprised you're not there.
7. Trying to suggest you need to do a scope 3 target differs with my opinion.

What is important to reach targets in the organization?

1. Diversity and people are good to have. But fundamentally, having the commitment from the top is important. We want to be a responsible system, and the management system should be foundational. So what you do must be a system driven thing. Not because you have a charismatic CEO. You want to have the legacy to having a system and processes. Have things documented. That is the key. So when doing climate, having a management system is important.
2. The commitment from the top you can count on.

CEO compensation

1. There are so many things a CEO worries about. What do companies do when they wake up in the morning? Let's have the assumption that everybody wants to be responsible.
2. ESG payments; a bit more skeptical about it. The CEO has a lot on his or her plate. And ESG are very distinct areas.

View on stakeholders (in terms of general goal)

1. External and internal assessment to set goals. We look at stakeholders in terms of understanding their viewpoints. I wouldn't say we are totally internal. But we are not extreme in looking for external entities as a stamp of approval, as the SBTi. But we consider the other, we read what they say, with the investors, employees, there are always discussions. They are not approving XX.
2. Some companies have formal relationships with stakeholders and decide on goals with them.
3. If you are customer based, then the need to have consultants or listen to customers might be there to join the SBTi.

General

1. Why do you not join? Is a question I need to answer all the time.
2. Peel the onions step by step. Why don't you join? We have science-based targets. Why not including scope 3? etc.
3. Some companies are facing the consumers that keep on asking for sustainability. They get tired and just get the checkbox for SBTi. But if they feel happy with the stamp, go for it. Then it's a need.
4. But the name is just more about a stamp instead of the targets.

E.3 INTERVIEWEE C

1. We have a social responsibility. We take that serious. You can do that on your own, but you need to be able to compare to competitors, and the whole market.
2. We set serious ambitions.
3. If we have a very bad reputation, nobody will buy our stuff. So, it's also about protecting your business.
4. The SBTi is a green label. We can set the target ourselves, but to let them be accepted we need that piece of visibility. And it is always good to let targets validate by an external organization.
5. Hick-ups: we don't want to set targets while we cannot make them true (because stakeholders always say something about us). Therefore, joining the SBTi is something which is carefully considered.
6. We consider what, if we do not make the targets, are the consequences for our reputation in, for example, 100 years. Everything we say is very weighted heavily. We are being audited every time.
7. If SBTi helps with making our targets and ambitions visible. SBTi is widely supported and therefore we go with it.
8. We are one of the frontrunners in the IT sector, we have a big footprint. You always need to consider whether we can make our targets.

Stakeholders

1. Our clients have ambitions (zero waste, zero emission). If our clients use our technology, we need to make sure that we arranged all our targets well too. Our sustainability report shows we are making progression. We need to take the role of being sustainable.
2. I think B2B is very important. Our clients are businesses. Some end-consumers are critical, but most customer just buy something because it's cheaper. And with B2B, the clients have selection criteria in their tenders. Therefore, we also need to keep track on our ESG criteria. It is becoming a hot topic for businesses.
3. Employees are not per se asking for sustainability, but it can be a factor.

Organization Culture

1. Sustainability Community is the advising organ for leadership. The sustainability community is very broad for all business units. We help them accelerating sustainability in the business. Sustainability officer is well aligned with the community.

Innovation

1. If you do not have innovation capabilities, target setting is less common.

Diversity

1. Diversity is very important. Different communities have different insights. A lot of young people join the sustainability committee, in all kinds of forms, sizes and colors. This needs to be a solution that is supported by a broadly supported community.

Efficiency

1. Sustainability costs money. But if you transform digitally, like we do, then sustainability can also deliver efficiency. One cannot do without the other.

2. Our platform gives insight in emissions and can be used within different organization. You can set targets in the platform, but we need data first to identify your emissions. Then see where the pain points are, and where we can make the difference.

CEO compensation

1. It helps. We have a carbon tax, which you can see as punishment. But you can also see it as money which you can set aside to invest in other solutions to reduce the footprint. We don't want to do too much with carbon offsets.

2. We have 87% scope 3 emissions insights. We can report them with the data we get. For the last 13% we need a network. But also, we need to help companies to report the scope 3 emissions. We are helping them with our tool or in other ways. The goal of our platform is to create the same data language. It is very hard to communicate emissions to each other when not using the same format. Hopefully, at one point, everyone communicates in the same language. That would definitely help to identify scope 3 emissions.

E.4 INTERVIEWEE D

1. I do interact with businesses, but more when they are involved in our advisory groups.

2. Reasons differ between companies.

Stakeholders risks - investors

1. They are requested to do so by their investors. It is a way to demonstrate business competence and to account for policy and transition risk in their business. The latter is the risk that companies face due to the possibility of climate policy being introduced sometime in the future. So for example for automotive, if they do not shift to EV and the EU faces out combustion engines, then the company is not going to perform well. It is thus a way to be ahead of the curve and protect themselves against these future risks. Often companies make the decision to set science-based targets to account for this risk for their stakeholders, shareholders.

2. So, are corporates that are more able to identify risks more likely to be a member? I don't think so. Companies have different ways of dealing with transition risk. 1) set SBT and shield yourself transition risk, and 2) lobby against the policies that would but your companies at risk in the first place. E.g. oil and gas are going to be lobbying to prevent policies. This is a very disturbing reality to us. So, companies that do not join are not bad at addressing their risk, they are just addressing their risks in a different way. I think companies that join SBTi are less likely to lobby against those policies.

Reputation

1. Some companies are doing it as a way of improving their reputation, externally and internally with their staff. My expectation for some of the successful companies, such as Google, they are facing a lot of pressure. Setting science-based targets, climate leadership, helps them to keep stakeholders and staff satisfied. Also, companies that set their targets themselves are not credible.

Goal orientation and innovation

1. Give company clear goals for the staff to work towards, and it helps drive innovation. If you are setting a more aggressive target than what you know you are going to achieve, it is an incentive for your staff to develop more innovative solutions. Myself, I am not seeing how this gains profit. What we are optimizing for is emission reduction, and the kind of co benefits (logistical improvements, improved efficiency in their supply chain). These co benefits are very important for the businesses as well. But its more helpful to frame it around climate, because it is a huge factor for employees as a motivation.

2. Also, the other way around, you need innovative capabilities to establish these targets. We see a pattern of more innovative companies joining.

Scope 3

1. That is really a crucial part of the picture: companies can't achieve scope 3 on their own. It requires coordination across different actors. It is also going to support it by policy. We support them with some instructions on how targets can be met. But we are not going to solve this entire problem. There are other platforms that can identify emissions in the supply chain.

Stakeholders – end-consumer focus

1. There is not a big difference between B2B and B2C joiners. Supplier engagement method: large companies commit to a certain percentage of their suppliers setting science-based targets. It is a way to have these targets cascade along the supply chain. This is another reason to set science-based targets for, for example manufacturers. So, another reason to set these targets, for suppliers, is that they are being incentivized by the purchasing business. That is an important one. It is crucial for net zero because a lot of change is driven by purchasing power. All of the upstream suppliers of e.g. Nike, Amazon are going to exposed to consequences if they are not setting targets themselves.
2. End-consumers are also asking for it.

Company size

1. Why are larger companies more likely to join? Good question. We target larger companies a little bit more because they have the most emissions.

CEO compensation

1. CDP collects data about CEO compensation. Tie executive level compensation to climate action. But I don't know whether it is linked to science-based targets.

Organizational culture

1. Diversity: I don't know that from my experience.
2. Typically, we are speaking with someone who is part of the sustainability department. It was common 4 years ago that 2 people to work on sustainability. Nowadays they have big departments. We are not necessarily speaking with the C-suite, but most likely with someone just right under. A lot of companies use consultancies to set the targets.

E.5 INTERVIEWEE E

1. We were one of the first participants in the SBTi. When we started, we had to introduce it to the organization.
2. We did have climate targets ourselves, but thought it made sense and seemed fair to join the SBTi.
3. Before that, we often had discussions with senior management on how we came up with certain emission reduction percentages. Now they are well aligned with science.

Market Success

1. Standardized approaches are needed to compare. This makes it easier for investors too.
2. These standards are really important.

Management

1. I think not using those standardized approaches and thinking you can set science-based targets by yourself as a company, is often seen at more conservative companies.
2. Those companies where management is very well aligned and which are conservative, need to know how to exactly get to the targets.
3. However, there is no clear pathway to the science-based targets. Therefore, you have to have some faith but that is not how conservative companies work most of the time.

Maturity

1. We started 20 years ago with sustainability. The topic was very controversial.
2. If a company just started with sustainability, you have a big learning curve. It might be very difficult then. It could be that companies which are involved in sustainability for quite some time have their targets aligned by themselves, which makes it harder to make the step to joining the SBTi. But for us, it was a way of standardizing.

Legitimacy

1. Investors, regulatory pressures are all present. We are dealing with the green deal now.
2. You need to align with those stakeholders' visions.
3. End-consumers are at the moment less driving corporate climate action compared to Europe. Consumers in Europe are more involved than in the US. However, in the US, those regulations – which are still proposed regulations – give the biggest pressure. Companies know that they need to start reporting, for example, if these regulations pass.
4. Employees have expectations as well. It is a way of talent attraction.

Social insurance

1. Reputation is important. It is not per se that you have a bad reputation if you do not join, but I think you have a better reputation when you join. Or when you take climate action in general.

Company size

1. These target setting and reaching takes resources. To do this level of research you need people. To spread it in the whole company. Or you must have a huge budget for consulting, then you might be able to do this when you are a smaller company.
2. You need a senior team with senior managers that is involved. You need sustainability people to reach targets and align them with the strategy.

Innovation

1. Reaching targets requires innovativeness. We need to decarbonize and therefore, a lot of stuff needs to happen.
2. Our scope 1 and 2 emissions are relatively small compared to scope 3. Therefore, we have a lot of control over consumer emissions. We thus need to develop sustainable products.
3. You need an innovation mindset to do this.

Diversity

1. I am curious how this relation works. I don't know it for sure.
2. But, if I look at our company, there could be some underlying reasons for the relation between diversity and membership.
3. For example, we have our diversity and equality commitments well aligned, and the same accounts for sustainability commitments.
4. I do see that there is a pattern in women being involved in sustainability. I see more women who are CSO than men. Might be because it is a new field, and that they are able to compete in this field.

E.6 INTERVIEWEE F

Guidance

1. Joining the SBTi creates guidance on what the corporation needs to do. What is feasible per industry. What can we do, what is needed to do? Clear guidance is necessary. For instance, by joining the SBTi, companies learn where they need to get to as an industry.
2. We did have climate targets ourselves, but thought it made sense and seemed fair to join the SBTi.
3. Before that, we often had discussions with senior management on how we came up with certain emission reduction percentages. Now they are well aligned with science.
4. The targets are aligned with targets that need to happen.

Company size

1. It takes a lot of people to achieve the targets. It has to be a structured process.
2. For smaller companies it is practical to join the SBTi because their guidance helps them with setting and achieving targets, where they do not have the resources to get sustainability people involved in their own organization.

Risk

1. Corporates face the risk that their reputation will be damaged due to their climate actions, often labeled as greenwashing. You really do not want to be called out on greenwashing. Consumers can call you out if you are not being honest about everything. SBTi could help avoid greenwashing. There are clear metrics, and you need to report.
2. Using the SBTi just to set a target and receive the stamp could be possible, but it is noticed if you do not do anything with your targets. You need to explain why you are not reaching your targets.
3. The SBTi marks that you set your science-based targets really seriously.

Social insurance

1. You need to be able to show you are doing things right. It is the right thing to do.
2. Leadership is genuine. It is the right thing to set science-based targets.

Stakeholders

1. Investment banks are pushing corporations. Risks are imposing to the business. It depends on the location of the company. For instance, in dry areas the investors are more aware of the impacts of climate change.
2. There is pressure from consumers, in a more general way. I hope Gen Z will save us in that sense.
3. More pressure comes from the largest purchasers. They have to purchase according to scorecards in the U.S. Therefore, are forced to demand certain climate action of corporates.

Efficiency

1. The SBTi has a critical mass of corporations. I don't know if it really creates efficiency. They do not share too much.

Market Success

1. The SBTi creates a platform that creates comparative targets. They are all set within the same methodology so you can compare yourself with others, and investors can compare businesses better. It is a form of competitive benchmarking.
2. There is a peer pressure element as well. If anyone else is member, then others are joining too.
3. Companies wanted to take leadership climate action but they wanted it to be valid and credible. The SBTi methodology is the only standard now. First, corporates were offsetting, but that was not 'real'.
4. Companies want to be leaders in the space, and they believe in this work.

Maturity of the sustainability program

1. You need to have a clear understanding of your impact. The more mature the sustainability program, the more they recognize the target. You need people to be able to push.

Industries

1. Industries need to collaborate in the space of re-procurement.

The SBTi and policy

1. I don't believe that the SBTi delays policy formation. Any politician rally wants to solve climate change. For the SBTi, it would be cool to harmonize with corporations that are already involved in science-based targets. So punish them less hard when future policies are actually formulated by policymakers.

E.7 INTERVIEWEE G

Stakeholders

1. Stakeholder engagement is really important.
2. The scope 3 emission calculation positively influences others to engage as well.

Risks

1. It is hard to know how much is enough and by when. The SBTi helps with that. Companies know that without validation, the targets are nothing worth.
2. This has also to do with reputation risks and greenwashing concerns. And transition risks, which I consider to be more of a relevance on the long term.

Market Success

1. There is a peer collaboration. If others join, you need to be part of it too.

Organizational Culture

1. The momentum is now. We see companies moving from non disclosure to investing in SBTi participation. Their top priority is to set a target. And if they are not able to set one, they hire a consultancy.
2. You need dedicated function to do all of this. You need central function to implement this in the organization. They need tools to let everybody act.
3. Target is a company's strategy and guiding start.

Innovativeness

1. A reason not to join is because of the technical difficulties. That companies do not know what the technology is going to be. Some are just very afraid of the unknown, which causes a lot of hesitation.
2. Scope 1 and scope 3 emissions are more difficult.

E.8 INTERVIEWEE H

Market Success

1. It is important to consider what competitors are doing.
2. SBTi brought clarity on what the companies should have been doing. To position themselves as a leader in the industry, to provide clarity into the number (for internal communication), and peer benchmarking.
3. Also, because everybody is doing it: peer pressure within a sector. Other will simply join because you cannot be the outlier.
4. The real differentiating factor is whether the CEO wants to be a leader or not.

Stakeholders

1. Investor pressure is relevant.
2. Stakeholders differ per sector and region. With the latter, I mean regulations and investors that have different perceptions in different regions.
3. Customers and investors are the most important. However, specifically with regard to the SBTi, I think customers have no clue what this initiative is. But they do give pressure. The think is that corporate just do not know how to navigate this.
4. B2B pressures definitely exist. Their target setting creates pressures.
5. Consumer facing companies seem more active and their brands are really recognized. As a consumer, it touches you more when you were their clothes, then if their isn't a specific product or service that affects the consumer.
6. Bigger companies face more pressure from stakeholders. They also have the resources to set those targets. But again, they need to be willing to be the leader in the space.

Efficiency

1. On the short term, it will costs you money to join. In 2/3 years, it will still costs you money because you have to make investments to reach the targets.
2. In 10/20 years it can make savings. It is harder to get to that short term goals.

Risks

1. Companies are starting to look into risks. They are already facing the consequences of climate change. But still, they are forced to do something and do the bare minimum. You hope that it is their mission to set science-based targets.

Innovation

1. It is much more about their willingness and their culture. Not necessarily about innovative capabilities. If the culture is that they want to do more than the financial case.
2. You do not need innovation capabilities to set targets.
3. The bigger companies are targeted more often, because the highest impact can be made there. They of course, have innovative programs. Otherwise they would not have survived that long. Much younger companies: they come with solutions, but they do not set targets. SBTi is not built for companies that are small/start-up. Start-ups do not have the money, and no Human Resources.

Organizational Culture

1. It is about the company's mission and vision.
2. Sustainability committee is crucial. I have never encountered a company without one, if we look at joining the SBTi.
3. CEO incentive help. It is crucial to link that bonus structure to the environmental program.

Scope 3

1. Scope 3 is difficult for everyone. But it is a myth that we cannot control it, so we cannot influence it. That is just not true. For instance, companies can change all their decisions on packaging etc.
2. Scope 3 is, however, difficult in accounting and tracking progress.
3. A big buyer has more influence. So you do actually have that influence as a company.

F QUALITATIVE ANALYSIS

	Legitimacy	*Market Success*	*Internal Improvement*	*Social Insurance*	*Organizational Culture*
Interviewee A (non-member)	*Stakeholders* • Internally: employees expect the company to have similar values, which is also important for talent attraction. • Externally: there is a trend towards stakeholders expecting bolder/bigger actions. • Expectations often depend on the stakeholder's origin. • Sustainability awareness of customers is surprisingly increasing.	*Innovation* • Innovation and new solutions are required to reach science-based targets, and we need a network and collaborative actions to set targets. The current biggest hurdle is visibility and access of data, rather than innovation capabilities. *Company Size* • Bigger companies are often more of interest for stakeholders because the biggest momentum can be gained there. The push from the stakeholder is probably of the biggest influence, rather than size. • As a large organization, you want to push.	• SBTi target setting is believed to be related to gains to do things more efficient internally. • The biggest impact is having a clear milestone that is set. You need long term and interim goals to move the whole organization towards that goal. You need the goal to be set with timing. This can be achieved with SBTi. • Scope 3 identification is a big challenge if you have thousands of suppliers and customer in too many industries. Missing data is the biggest issue.	• Being a responsible business is an important thing, and SBTi helps with that. • You want to do something good for the company.	*Diversity* • Diversity in different angles is good for these types of decisions. *Leadership* • Decisions such as SBTi membership are leadership decisions, it is especially the CEO who decides if we make the commitment. • The board in general should constantly be pushing and leaning into different climate areas. • Incentives might help. Not necessarily to push such a decision over the decisions line but measuring/tracking things increase the likelihood of actions. *Management* • Having numbers of layers in the organization is important. Every functional silo plays a role, but you need a way to connect all expertise and depth, to be able to feed leadership. We do this with our sustainability committee that covers different pillars within sustainability.

Interviewee B (non-member)	*Stakeholders* • External and internal assessments are done to set goals. Stakeholders such as customers, investors and employees, and their discussions are considered. However, external entities as a stamp of approval for commitments are not looked for, such as the SBTi. • The belief exists that companies where customers are asking for sustainability get tired and just get the checkbox by joining the SBTi. There is nothing wrong with that if there is a need. • Stakeholders can be surprised when you are not on the SBTi list. *Sectors* • Regarding sector differences, it seems that a snowball effect exists within a sector. If one company joins, then more tend to follow. Also, for some sectors such as the IT sector, it is just easier to set targets when you look at their supply chain.	• As leaders in the space, you want environmental management. From a maturity standpoint it is believed that this company is mature in its sustainability program. Joining an initiative only because it is popular is not the vision, which might be different for others. It is always considered if the need is there to join an initiative. Thereby, it is asked whether the initiative helps in improving the environment.	• To set and reach targets and do it efficiently, an external party such as the SBTi is not needed. Our own foundational management and system centric approach helps with documentation and target reaching. • It is not believed that setting a science-based target is efficient if the SBTi keeps on changing the criteria.	• You want to be fair and critical as a company. You do not just want to join to be part of the club.	*Diversity* • Diversity in people is good to have, but fundamentally, having the commitment from the top is important. Then, you need to count on that commitment. *Leadership* • Skepticism exists on CEO compensation. A CEO has a lot on their plate, which is why there is trust in their actions to be responsible. • It is the job of corporate staff to be aware of different initiatives and communicate it to the board. *Management* • Our employees have a critical and engineering-focused way of thinking. That has built the management system, which is not dependent on people, but on the system. Therefore, a decision to join an initiative arises from the system and its needs.
Interviewee C (member)	*Stakeholders* • Our targets need to be ambitious and arranged because our clients have ambitions towards zero waste and emissions too. • End-consumers can be critical and demanding for sustainability, but most of the time they decide what to buy based on price. Businesses, on the other hand, have selection criteria for their suppliers or in their tenders. They must act climate friendly.	*Innovation* • Initially, you need innovation to gather data and analyze the data to set science-based targets. • If you don't have those innovation capabilities, target setting is less common. *Competitors* • You need to be able to compare to competitors and the whole market. Therefore, we need to let our targets be accepted by participating in the SBTi. • SBTi is widely supported and therefore we want to participate. • We are frontrunners with a big footprint. We want to set the standard, possibly together with others, so that scope 3 emissions will be reported in the same data language for everyone. That helps with the scope 3 emission identification.	• Sustainability costs money. But if you transform digitally, sustainability can deliver efficiency.	• We have a social responsibility. Joining the SBTi is about protecting our business. We cannot have a bad reputation, otherwise nobody will buy our stuff. • Target validation by an external organization is good. We need that piece of visibility that the targets are accepted. • The tricky part is that you do not want to set targets that you cannot make true. Therefore, joining the SBTi was carefully considered since we are being audited all the time.	*Diversity* • Diversity is very important. Especially young people join the sustainability pathway. That automatically brings people in all kinds of forms, sizes, and colors. *Leadership* • We work with a carbon tax, which works as an incentive. It is believed that incentives help for these kinds of decisions.

Interivewee D	*Stakeholders* • Companies are requested by their investors to set targets. It is a way to demonstrate business competence. • Big companies are facing a lot of pressure. However, their own target setting is not credible. • Climate action within the company motivates employees. • B2C companies experience that end-consumers are asking for science-based targets. • B2B companies experience that as suppliers, they are being incentivized by the purchasing business. A lot of change is driven by purchasing power. *Sectors* • Companies in the oil and gas sector are more likely to lobby against policies that would put their companies at risk. On the other hand, companies that are SBTi member are less likely to lobby against these policies.	*Innovation* • Companies need innovative capabilities to establish targets in the first place. We see a pattern of more innovative companies joining. *Company size* • The SBTi targets bigger companies a bit more. Because there the biggest impact can be made.	• Companies like goal orientation. Setting a more aggressive target than what you know you are going to achieve is an incentive for staff to develop more innovative solutions. It thereby drives innovation and increases efficiency. • Setting scope 3 targets is crucial but can often not be achieved by the companies. Policies could help in the future, because the SBTi helps companies to a certain extent.	• It is a way to account for policy and transition risk. This is the risk companies face due to the introduction of climate policy. Thereby, also protecting their share- and stakeholders. Joining the SBTi is a way to be ahead of the curve and protect themselves against these future risks. • There are two ways of dealing with transition risk: 1) set science-based targets or 2) lobby against policies. • It is a way of improving reputation, internally and externally.	• SBTi typically speaks with someone from a sustainability department. Not with the C-suite, but with someone from one level below. You see a huge increase in employee size of those sustainability committees compared to 4 years ago.
Interviewee E	*Stakeholders* • In the U.S., most pressure comes from regulations. Companies know that they need to start reporting sustainability practices. • In Europe, end-consumers are more involved and more aware of sustainability issues, and thus are putting more pressure on companies. • Employees have expectations as well. It is a way of talent attraction.	*Innovation* • Reaching targets requires innovativeness. • We need to create sustainable products to reduce scope 3 emissions. • You need an innovation mindset to do this. *Company size* • Target setting and reaching them requires resources. You need people to spread it through the whole company, or a big budget for consultants. You also need a senior team with sustainability expertise to align the targets with the strategy and to reach them. *Competitors* • These standardized approaches the SBTi offers are so important to compare different businesses. It makes it easier for investors to make more sustainable decisions as well. • Companies that are involved in sustainability since recently might be more likely to join. This is because they have a huge learning curve and setting targets by themselves might be hard.		• Joining the SBTi improves your reputation, while not joining it does not make your reputation especially bad.	*Diversity* • There could be underlying reasons for the positive relation between gender ratio and SBTi membership. For instance, we also have our diversity and equality commitments well aligned. Therefore, I expect companies that are quite progressive to focus on both. *Culture* • Corporates that want to set their own targets are often seen as more conservative. Meaning, they are not willing to use standardized approaches such as the SBTi because of their well aligned management with targets. These companies need to know every step that is necessary to achieve those targets. However, science-based targets require some faith, which is something conservative companies do not envision. There is just no clear pathway.

Interviewee F (member)	*Stakeholders* • Investment banks are pushing. • It depends on the company's location how the investors respond to effects of climate change. • There is pressure from consumers. • Largest purchasers play a bigger role in the U.S. due to scorecards.	*Company size* • It takes a lot of people to achieve targets. • For smaller companies, it is practical to join the SBTi due to the guidance it provides. *Competitors* • The SBTi facilitates benchmarking. It is the only standard. • There is peer pressure. • Companies want to be leaders. But they want it to be valid and credible.	• It is unknown whether joining the SBTi creates efficiency.	• It seems fair to join the SBTi, even though we had our own targets. • The targets are really aligned with what need to happen. • Reputation risk plays a role. Companies do not want to be labeled as greenwasher. SBTi could help avoiding greenwashing. • If you join just to receive a stamp, sooner or later you have to explain why you are not reaching the targets. • You want to show you are doing things right.	*Leadership* • Leadership is genuine. It is the right thing to set science-based targets. *Sustainability program* • The more mature your sustainability program, the more they recognize the target. You need people to be able to push.
Interviewee G	*Stakeholders* • Stakeholder engagement is important. • Scope 3 emission calculations positively influences others to engage as well.	*Competitors* • Peer collaboration: if others join, you need to be part of it too. *Innovativeness* • Some are afraid of the unknown. The technical difficulties are causing hesitation. • Scope 1 and scope 3 are more difficult to identify.		• It is hard to know how much is enough and by when. The SBTi helps with that by validating targets. • Reputation risks and greenwashing concerns are important drivers. And transition risks on the long term.	• It is the top priority of a company to set a target. • You need a dedication and central function to do all of this. • Target setting is a company's strategy and guiding start.

Interviewee H	*Stakeholders* • Investor pressure is relevant. • Stakeholders differ per sector and region due to regulations and perceptions. • Customers and investors are the most important. While customers are not expected to know the SBTi, they value it more when a company sets those targets when the company is consumer-focused compared to companies that are not. • B2B pressures exists too.	*Competitors* • It is important to consider what competitors are doing. • To position themselves as a leader in the industry. • Peer benchmarking is also important. • Peer pressure as well: others will simply join because you cannot be the outlier. • The real differentiating factor is whether the CEO wants to be a leader or not. *Company size* • Bigger companies face more pressure. *Innovativeness* • It is not necessarily about a company's innovative capabilities. • You do not need those capabilities to set targets. • Bigger companies are targeted more often. Those companies almost always have an innovation program, otherwise they would not have survived that long. • Companies can make decisions on, for example, their packaging. Thereby, influencing and controlling scope 3 emissions.	• On the short term, it costs you money. On the longer term, it is expected that it can make savings. However, it is harder to get to that short term goals.	• Companies are facing the companies of climate change already. However, they tend to do the bare minimum.	• It really is about a corporate's willingness and the culture. • It thus is about their mission and vision. *Sustainability committee* • Such a department is crucial. *Incentive-based compensation* • CEO compensation helps. But it needs to be linked to the environmental program.

COLOPHON

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