The behavioural determinants of corporate sustainability: Towards a comprehensive model of legitimate climate change communication

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Abstract

Today's world faces severe climate challenges (Adger et al., 2003; Campiglio et al., 2018), yet organisations and policymakers constantly fail to encourage change in people's engagement with pro-environmental behaviour. In the face of this urgent global challenge, understanding how to create genuine environmental advocacy is one of the most pressing policy-relevant yet under-studied topics in social science today (Van der Linden, 2014).

I argue that the answer to this predicament lies in recognising the complex decision-making processes amongst the workforce. Across four experimental studies, this thesis investigates environmental communication and behaviour in organisations from various angles, including emotions, leadership, talent attraction, and entrepreneurship. The overarching goal of this PhD research is to provide organisations and policymakers with insights on how to stimulate genuine environmental advocacy and allow them to create better-targeted, informed behavioural change interventions.

This thesis consists of a collection of four independent but related papers, which (together with the introduction, theoretical foundation, and general discussion) are presented in seven consecutive chapters. The first two chapters provide a selective review of interdisciplinary research on environmental advocacy. Analyses of the social backdrop of contemporary corporate sustainability are synthesised, and research

associated with environmental communication is considered, both inside and outside organisations. Theory and research on achieving legitimacy are then juxtaposed with strategies to encourage and promote environmentalism in the workplace.

The first empirical study (chapter 3) traces the relationship between climate change communication and leadership. It explores how organisational leaders should design environmental campaigns and, as a foundation for the subsequent studies, answers the question of who is more effective in inducing pro-environmental behaviour: High-ranking individuals or same-level peers. Building on the results, the next chapter analyses the concept of ceremonial conformity by examining the implications of hiring a Chief Sustainability Officer (CSO). The results show that organisations may employ a CSO to signal conformity but that the diversity of skills and the nuances found amongst executives accentuate the distinctiveness of the role and highlight the merits of appointing a CSO.

Chapters 5 and 6 investigate environmental advocacy outside of organisations. Chapter 5 identifies a pressing issue in sustainability research – greenwashing – as a common communication strategy to signal environmental conformity and extends the concept to recruitment and employer branding efforts. The final study (chapter 6) takes a public affairs perspective and examines how environmental policies can foster green entrepreneurship, especially in rural areas. By mapping the locations in which sustainable entrepreneurs cluster and subsequently explaining why this clustering takes place, this chapter provides a legislative roadmap for creating sustainability hubs in Europe. The thesis concludes by outlining managerial and legislative implications for genuine environmental advocacy.

Theoretically, the studies in this thesis draw primarily from two essential communication theories: Signalling and legitimacy theory. Notably, the theoretical contributions of the results go beyond communication and extend our understanding

of identity theory, power, and knowledge spillover. On a practical level, each empirical chapter provides recommendations for managers and legislators for implementing the findings in their respective contexts. The studies cover a range of different methods, including experiments and field studies, macro-economic analyses, and a novel machine learning technique. The dissertation further contains work from different geographical regions, with two studies conducted in China, one study focusing on the European Union (EU), and one taking a global perspective.

By bringing these various threads together, this doctoral dissertation contributes to a greater understanding of contemporary corporate sustainability by emphasising the important role of legitimacy in environmental leadership and sustainability communication. Besides extending our knowledge of signalling and legitimacy theory, this thesis provides a more integrated, systematic, and comprehensive understanding of climate change communication in organisations and, as such, is likely to help increase the saliency of behavioural research in the mitigation debate, especially in light of a growing demand for more evidence-based public policy (Gifford, 2008; Van der Linden, 2014).

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Declaration and publications

I, Lars Speckemeier, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

1. **Speckemeier, L.**, & Tsivrikos, D. (2021). Power on environmental emotions and behavior. *Social Responsibility Journal, 17*(7), 937–951.

2. **Speckemeier, L.**, & Tsivrikos, D. (2022a). Evidence of greenwashing in talent attraction: Is deceptive marketing an effective recruiting strategy? *European Journal of Business Management and Research*, 7(3), 14–25.

3. **Speckemeier, L.**, & Tsivrikos, D. (2022b). Green entrepreneurship: Should legislators invest in the formation of sustainable hubs? *Sustainability*, 14, 7152.

4. **Speckemeier, L.**, & Tsivrikos, D. (under review). Ceremonial conformity or sincere environmental responsibility? A skills-based analysis on the merits of appointing a chief sustainability officer. *Journal of Environmental Studies and Sciences.*

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1 | General introduction

Transitioning towards a sustainable society is one of the major quests of the 21st century. It requires informed strategic transformation on various fronts, including the development and execution of progressive policy frameworks and organisation-wide commitment to sustainability. In this effort, political and organisational leaders become essential facilitators of effectively raising environmental awareness and evoking genuine environmental advocacy. This doctoral dissertation culminates empirical insights from a variety of organisational contexts on how leaders of sustainable organisations can leverage effective communication techniques to create legitimate corporate sustainability.

The past two decades have seen a remarkable shift towards increasing climate change awareness and reducing carbon emissions (Baiardi & Morana, 2021). As will be demonstrated in this dissertation, leaders, employees, policymakers, and entrepreneurs alike indicate a willingness to actively work on sustainable solutions and thereby give hope to the transition towards a greener society. For instance, in a recent study of top executives, 72% stated that sustainability was 'extremely' or very 'important' for managing their companies' corporate reputations and brands (Bonini et al., 2010). There is also no shortage of qualitative studies showing that organisations are starting to think – and think hard – about how they can react to climate change (Henderson

et al., 2015). Tackling environmental challenges is also proving to be a lucrative commercial opportunity for both new and established businesses (Henderson et al., 2015). Demand for sustainable products and services is expected to surge since there is a good chance that a combination of rising environmental pressure and governments enacting stricter regulations will increase the demand for green products.

At the same time, when it comes to the implementation of sustainability strategies, organisations struggle (Gallotta et al., 2016; Gibbs & Jonas, 2001; Siegel et al., 2019). Although most organisations indicate that sustainability is important for them, companies differ considerably in their approaches to incorporating sustainability, with some evidence suggesting that sustainability is a minor or non-existent priority for many businesses. According to the same poll mentioned above, 20% of respondents claimed that their businesses did not have a clear definition of sustainability, and 56% stated that they operated with two or more definitions at the same time (Bonini et al., 2010). These differences concerning the rationale for and execution of environmentally focused strategies are therefore concealed by the corporate rhetoric of a high commitment to sustainability (Broccardo et al., 2019; Hahn & Scheermesser, 2006). So, where does this disparity between general environmental readiness and failing strategic transformation come from?

The transition towards social and environmental welfare rests on the foundation of environmental integrity, social equity, and economic prosperity (Bansal, 2005; Camilleri et al., 2017). The responses go beyond what is usually expected of organisations in a capitalist environment (Patriotta et al., 2011). As stated by Camilleri et al. (2017), scholars proclaim that legitimacy in resolving sustainable-development issues necessitates active involvement with stake- and shareholders (Freeman et al., 2010; Freeman & McVea, 2001; O'Riordan & Fairbrass, 2008) and the capacity to form collaborative connections with a wide range of stakeholders that are built on trust (Sharma & Vredenburg, 1998). In other words, to face the challenges and expec-

tations of today's markets, multi-stakeholder engagement and clear strategic agendas to implement corporate sustainability are mandatory (World Bank, 2009).

However, increasing stakeholder demands and changing regulations have elevated pressure for organisations to conform with societal standards, even if a company may not be in a position to meet these expectations. Given the complexity of economic and societal changes and corporations' role in facilitating global warming, consumers, investors, and policymakers may question the authenticity of corporate statements or may even develop a certain level of apathy or scepticism towards sustainability claims. The motivation for this thesis lies in the dissonance between organisations taking a genuine environmental stance and those who adopt a symbolic or selective ceremonial conformity. Throughout this dissertation, both the moral and strategic imperatives for corporate sustainability efforts are examined theoretically and empirically to investigate the role of legitimacy in corporate sustainability communication.

The remainder of this chapter reviews the challenges emerging due to climate change and the role of organisations in the transition towards a greener economy. The chapter then turns to the challenges and opportunities organisations face when aiming to address this strategic transformation. The review explains why it is both necessary and costly for businesses to accelerate their sustainability-focused policies and argues that addressing the transition will require not just considerable changes of organisational policies, hierarchies, and operations but also a transformation of the way environmental advocacy is defined and evoked in organisational settings. The chapter draws to a close by indicating the placement of this thesis within the current literature and the outline and structure of this dissertation.

1.1 Problem context: Climate change

Amongst the various challenges facing today's world, one issue has unanimously been acknowledged as the most critical: Climate change. In his handbook on sustainability, Blackburn (2012), together with 259 co-authors from 39 countries, declares climate change as *the* defining challenge of the 21st century. Considering what we as a civilisation have achieved over the past 100 years, it becomes evident that our current economy, in principle, is not sustainable. The world's population has risen from 1.5 billion to about 7 billion in the last century, with some predictions estimating that it may reach 9 billion before plateauing (Godfray et al., 2010). Simultaneously, the economy has expanded at a breakneck pace. While the population has nearly quadrupled since 1950, GDP has increased by more than nine-fold (Henderson et al., 2015). This development has lifted billions of people out of poverty and provided hundreds of millions of people with lifestyles they could never have dreamed of. Still, it has also put tremendous strain on the physical environment to support this economic growth. Since 1950, agricultural productivity has quadrupled, with 38% of the world's land under irrigation (Young & Esau, 2015). Furthermore, energy consumption has almost tripled in the last four decades and is expected to triple again in the next fifty years (Young & Esau, 2015). As a result, carbon dioxide emission rates have risen drastically (Henderson et al., 2015).

Upon examining all of these trends together, it becomes clear that we as humans are the undeniable cause of climate change. The ramifications are universal and, at some point, irreversible (Adger et al., 2011; Ayalew et al., 2012; Knutti et al., 2016). And yet, there is not only scepticism or denial amongst certain groups of individuals, but even the general public often declines to actively fight climate change (Capstick & Pidgeon, 2014; Poortinga et al., 2011). One of the reasons for this reluctance lies in the nature of environmental behaviour. Despite widespread knowledge and concern, it can be regarded as a psychologically distant risk, both

Table 1.1: Challenges surrounding environmental behaviours.

Problem	*Context*	*Example*
No direct impact	Changing climate and environmental ramifications are often not visible to an individual.	Recycling or taking the bike to work does not (visibly) reduce global warming.
Effects are long-term	Besides visibility, environmental impacts are also long-term processes. Most environmental agendas are designed to reach goals in the next decade or even longer time frames.	Upholding the goal of the Paris Agreement of global warming rising no more than 1.5 degrees Celsius is not defined with a deadline.
Proximity to hazards	Climate change is a global problem. However, not all regions are affected equally. While especially industrialised countries are responsible for higher amounts of CO2 emissions, other regions may feel the most direct consequences.	Environmental hazards in the form of natural disasters are not distributed equally across the globe. Thus, while country A may significantly contribute to global warming, country B is more likely to suffer the consequences.
Profitability vs. sustainability	Sustainable solutions are often more expensive options and thus counter-intuitive for the 'rational agent'. Companies may forego profitability for sustainability. Similarly, consumers may also need to pay a higher price for sustainable goods.	Sustainable travel options might not be the quickest method of travel. Taking the train from Cologne to London, for instance, not only takes a longer time compared to taking a plane, it is also often the cheaper option.
Inconvenience	Environmental behaviours are often associated with an extra effort.	Taking the bike to work, as opposed to the car, is less convenient.
Behaviours are voluntary	For most contexts, pro-environmental behaviours are voluntary. Thus, each individual needs to develop a strong intrinsic motivation to uphold such behaviours.	Tasks like recycling or waste separation are neither prescribed nor controlled.

temporally and spatially (Brügger et al., 2015; Leiserowitz, 2005; Maiella et al., 2020; Pahl et al., 2014). Positive outcomes of climate actions are often invisible, take a long time to emerge, and are of low personal importance to people (Bremer & Linnenluecke, 2017; Paeth & Otto, 2009). Especially when compared to other pressing economic and societal issues, such as the recent Covid-19 pandemic (Jin, 2020), climate change often fades from the spotlight (Eriksen et al., 2011; Lo & Chow, 2015; Norton & Leaman, 2004).

The results summarised in Table 1.1 helped expand our understanding of individual environmental behaviour by adding nuance and theoretical depth to more

basic models of rational economics. They inspired the early stages of planning this dissertation, and their influence can be seen throughout the empirical chapters of this thesis. While individual behaviour is indeed a promising research domain, the field has already been studied for a respectable amount of time. There have been serious efforts to link fundamental areas of psychology with environmental actions and climate change. However, an area with significant room for further research is corporate sustainability, which is where this thesis is situated.

1.2 The role of organisations in combating climate change

In today's economy, organisations are the primary contributors of climate change (Barley, 2010). This makes organisations both a part of the problem and the solution in the climate change debate. If societies do not transform the collective action of organisations, then sustainability improvements are unlikely to arise. This conjecture has not gone unnoticed by stakeholders. In fact, a common perception of various stakeholders is that a company's success today is no longer judged from an economic standpoint alone. From employees to investors, stakeholders are increasingly concerned about the social and environmental performance of companies (Sarkis et al., 2010). Thus, developing a perspective and narrative around sustainability transformations as an organisational challenge could help highlight the importance of understanding the role and potential of organisational processes in promoting or reducing climate change. In other words, meaningful improvements in combating climate change will not be possible until the world's largest corporations undergo significant transformations.

In the intersection of environmental science and business, the discourse of corporate sustainability has emerged. Corporate sustainability is an interdisciplinary subject that draws from various disciplines, such as economics, sociology, psychology,

and science, and has implications for a multitude of areas, including but not limited to policymaking and governance, organisations, charities, and NGOs. This diversity has brought about a wide range of terminologies and definitions, many of which are covered in this dissertation. Corporate sustainability is embedded in the larger theme of corporate social responsibility (CSR, Montiel, 2008). It is also often associated with one of the areas of the triple bottom line, the idea of balancing social, environmental, and economic goals (Peters et al., 2018). When it comes to corporate sustainability, researchers often take an integrative perspective in examining the triple bottom line (e.g., Hahn et al., 2014; Van der Byl & Slawinski, 2015), arguing that companies should try to balance rather than prioritise these three goals. A proactive corporation will want to be viewed as social-first, as this will eventually affect its bottom line. Whether this requires them being genuinely sociable becomes the key question of this dissertation. But before addressing the research question, the road to becoming a sustainable organisation will first be outlined.

1.2.1 Challenges of building sustainable organisations

Several real and perceived difficulties bedevil the ambition to implement sustainability solutions on a global and meaningful scale. These challenges include the lack of consensus on how to communicate climate solutions within an organisation, the fear of facing reputational harm, and insufficient leadership practices.

Specifically, one of the key barriers is the lack of internal consistency between core business and sustainability strategies (Taticchi & Demartini, 2020). While a board may decide to shift its organisation towards a certain sustainability goal, it may not be effective in communicating this goal across the organisational hierarchy (Etzion et al., 2017). Simply put, aspirations do not always translate into action. This consistency gap is one key obstacle to achieving sustainability results (Taticchi & Demartini, 2020; Thornton et al., 2011). Given the omnipresence of environmental

issues, green initiatives merit a universal understanding and holistic implementation. Sustainability is, in many instances, a concept that is limited to supply chains, despite its potential to improve the entire value chain (Seuring et al., 2005; Vurro et al., 2009). Furthermore, sustainability is a dynamic ideal that is constantly developing (Farrell & Twining-Ward, 2005). It necessitates a nuanced balance between explicit objectives and metrics and sufficient adaptability to respond to emerging circumstances (Taticchi & Demartini, 2020). Yet, expertise and best practices are still evolving and might be difficult to come by. Thus, policymakers and organisational leaders must continue to ask the right questions and stay on top of emerging trends and issues. In sum, when the direction of change is emergent – not pre-established – stability and change coexist continuously (Saegert & Winkel, 1990).

Secondly, while disregarding markets and stakeholder expectations can lead to serious harm for an organisation, tackling corporate sustainability in the wrong way can be even more harmful. One example of this is the Volkswagen emissions scandal (Schiermeier, 2015).[1] As one of the biggest scandals in the automotive industry, this event became the benchmark for unethical environmental practices, resulting in severe legal disputes and substantial reputational damages. What made matters even worse is that the companies involved decided to hide their practices and alter performance data. In return, intentional mismanagement and cover-ups raised significant stakeholder scepticism and loss of trust.

On a related note, organisations are also faced with increased transparency. As an artefact of the digital age, new communication technologies and ubiquitous access to company data turn every stakeholder into a potential reporter who can

[1] The Volkswagen emissions scandal, also known as Dieselgate, is the combination of a series of mostly illegal manipulations by various car manufacturers to circumvent statutory limits for car emissions and, in return, political influence to protect them. The German car manufacturer Volkswagen AG used a specific device in the engine control of their diesel vehicles, which ensured that the US emission standards were only met in a special test mode. However, in regular operation, a large part of the emission control system was switched off.

spread news on social networks unfiltered and in real time. As a result, reputational risks are often cited to be a greater fear for board members than actual malfunction (Mayer, 2017). With outside pressures on companies increasing, every product, service, or brand is at risk of being judged negatively. This can affect sales markets and jeopardise the ability of companies to recruit talented employees and retain them in the long term. Additional risks that organisations might face from the outside include regulatory risks, physical risks, litigation risks, reputational risks, market risks, and social risks.

Thirdly, creating sustainable companies requires a considerable adjustment in a firm's identity and its essential structure and procedures. An extensive body of research has demonstrated that large-scale organisational transformations are complex endeavours (e.g., Dikert et al., 2016; Hannan & Carroll, 1992; Rivkin & Siggelkow, 2003; Sligo et al., 2017). Any strategy transformation must address the power and politics, organisational procedures, capabilities, and entrenched agency challenges within and outside of the firm (Greenwood & Suddaby, 2006; Nadler et al., 1997). Effective corporate transformations demand a coherent definition of leadership principles and a clear distribution of authorities. Adopting environmental change necessitates challenging long-held preconceptions about what firms do and how they operate (Thornton et al., 2012). The leadership team must be able to govern dexterous change, which means that they must be able to manage both operational efficiencies of business as usual and entrepreneurial uncertainties of new strategies.

In essence, some of the key challenges that organisations face are (a) having the ability to understand the ever-changing sustainability landscape and the ability to communicate initiatives effectively, (b) the risk of reputational harm due to increased transparency and stakeholder scrutiny, and (c) adjusting the firm's identity and leadership structures.

1.2.2 Opportunities and contributions of organisations

Despite these challenges, private-sector commitment to climate action is gaining momentum (Biagini & Miller, 2013). Companies increasingly adopt strategies aimed at reaching net-zero emissions. Some companies, for example, pledge to invest in nature through the purchase of natural climate solutions (or carbon credits) as part of this effort; around 700 of the world's largest companies have already committed to significantly reducing carbon emissions by 2030 (Hatami & Hilton-Segel, 2021).

As with any corporate transformation, when there are risks there are also usually rewards. One of the most frequently cited opportunities for becoming a sustainable organisation lies in innovation and the resulting financial benefits. Companies can gain a significant competitive advantage by focusing on innovation, tackling new services, products, and markets, and disrupting their business models or inventing new ones. Similarly, creating intangible assets, such as enhancing the corporate image and brand, can also increase the recruitment and retention of talent (Bin Magbool et al., 2016). A holistically oriented corporate management thus strengthens future viability in a radically changing world.

Expanding on Sterman's (2015) review, there are several other benefits that firms can obtain by embracing environmentally friendly practices. Firstly, alliances and partnerships forged across the supply chain can lead to reduced overheads and shorter delivery times. Secondly, private-sector innovation has the potential to shape political agendas, resulting in financial benefits and subsidies. Thirdly, the success of any one firm in adopting green practices can inspire competition and imitation among other businesses. Lastly, sustainability-oriented firms have the unique opportunity to bring together actors from various sectors, fostering a sense of shared responsibility for addressing environmental issues. This collaborative approach can pave the way for

cross-sector coalitions and even lead to the establishment of new organisations solely dedicated to taking action on these pressing matters.

1.2.3 Communicating environmental advocacy

In weighing the opportunities and challenges that result from a strategic transition towards corporate sustainability, it becomes clear that effective communication is crucial in achieving actual results. Scholars have recently pointed to an evolving interplay between communication and corporate sustainability (Herzig & Schaltegger, 2006). Corporate communication is gradually becoming a vessel for ensuring public interests in business and demonstrating adequate corporate citizenship and commitment to various constituencies. Vice versa, sustainability-driven social coalitions mirror a company's conscience and long-term commitment to stakeholder accountability. Such mechanisms include appointing sustainability board members, forming business units dealing with environmental ethics, starting green branding initiatives, establishing sustainable innovation hubs, and formalising stakeholder complaint and dialogue channels (Abson et al., 2017; Ferrer-Balas et al., 2008; Rees, 1995; Schaltegger et al., 2016).

All of these mechanisms are supposed to signal conformity with societal aspirations and standards (Boiral, 2007; Springett, 2003) and assure regulators and investors that organisations are fully transparent and accountable. However, companies may also be enticed to portray themselves as sustainable without actually changing their core identity. Given the increased regulatory pressure to align with sustainability standards and potential market opportunities when catering to environmentally conscious customers, the advantages of deceptive or disingenuous communication and marketing practices are evident. Ineffective corporate communication on climate action, combined with low public confidence in the effectiveness of past sustainability solutions in contributing to real and measurable environmental impacts, have further led to widespread suspicion that companies may be tempted to use green initiatives

as a tool to signal conformity without significantly changing their core operations. Accordingly, corporate sustainability practices have been criticised for being more akin to ensuring long-term capital profit-seeking (Milne & Gray, 2013), with social or ecological concerns receiving much less attention (Banerjee, 2011). Consequently, corporate sustainability claims can raise scepticism amongst stakeholders, prompting researchers to investigate the origins of this mistrust and enticing firms to develop more thorough communication strategies (Moratis, 2017).

Several researchers have highlighted that scepticism, cynicism, suspicion, and distrust of sustainability efforts are based on the structural imbalance between communication and actual practises (Becker-Olsen et al., 2006; Laufer, 2003; Ramus & Montiel, 2005). Part of this discrepancy builds on the fact that many policies follow a symbolic or selective, rather than substantive, purpose (Christmann & Taylor, 2006; Marquis & Qian, 2014; Perez-Batres et al., 2012). Another part may result from the unobservability of sustainability efforts, the idiosyncrasy of the environmental concept, and the resulting inability of stakeholders to perceive sustainability congruence (Matten & Moon, 2008; Terlaak, 2007).

Given the complexity of illegitimate environmental advocacy, how companies achieve a positive appraisal is yet to be examined thoroughly. Some open questions are: How can we detect corporations that have illegitimately pledged their commitment to honest and fair corporate governance principles merely to signal conformity? Are companies ill-advised in employing green initiatives considering the risk of increased stakeholder scrutiny and being accused of greenwashing? What strategies and practical implications can be derived from theoretical concepts of behavioural economics and corporate sustainability research? These inquiries can and should indicate a convergence between corporate communication and social responsibility. By taking these questions together, the central topic of this doctoral dissertation is to identify the determinants of genuine environmental advocacy in organisations.

1.3 Critical reflection and literature placement

1.3.1 Sustainability research: Some critical reflections

Understanding and changing organisational behaviour is critical to addressing climate change, given the role organisations play in it. However, as recently as 2009, only around 2% of research on pro-environmental behaviour was conducted in organisational settings, with the majority of studies focusing on pollution and only a limited number taking a theoretical perspective (Davis & Challenger, 2009). To explore why the number of behavioural studies in this domain is comparatively low, several challenges will be outlined below. This reflection aims to provide a critical consideration of the advantages and limitations of behavioural research in the sustainability domain.

The first limitation is the absence of adequate data. Environmental psychologists are frequently criticised for focusing their investigations on a particular sample, which includes mostly younger individuals (such as students) who are educated, affluent, democratic, and come from Western, industrialised countries (Muthukrishna & Henrich, 2019; Weiss & Barth, 2019). Geographically, most studies have taken place in Europe, North America, and Australia, and a few studies have focused on Asia and South America. Yet, there is a significant gap in how sustainability is conceptualised, integrated, and implemented in other regions of the world (Ivanaj et al., 2015). The resulting sample selection bias not only questions the applicability of both theoretical and practical implications, but it also limits the transferability of results to regions or populations who are most likely to be affected by environmental hazards (Mendelsohn, 2009; Thornton et al., 2009).

A second challenge is the type of studies used in sustainability research. Psychologists typically advocate for experimental studies in controlled lab settings. While lab studies have methodological advantages, such as reducing the impact of

confounding variables, they also limit the applicability to actual organisational or human behaviours. For instance, an often-cited critique of environmental studies is the measurement of intentions rather than actual behaviour (e.g., De Bruin et al., 2012; Nguyen et al., 2019; Sheeran & Webb, 2016). As De Bruin et al. (2012) noted, intentions usually only explain 20% to 30% of the variance in behaviour and are subject to the social desirability bias (Bhattacharjee et al., 2014; Hassan et al., 2016). Especially in environmental contexts, the complexity of systems and standards for tracking and reporting different aspects of sustainability limit the interpretability of self-reported attitudes and actions (Benn et al., 2014; Mustapha et al., 2017). These methodological deficiencies have resulted in practitioners questioning the efficacy of incremental behavioural change approaches as they do not fundamentally address broader socio-cultural conventions (Van der Linden, 2016).

A third limitation results from the deceptive nature of certain sustainability claims and the challenge of detecting and evaluating genuine data. Building on the concepts of ceremonial conformity and greenwashing, corporations may be incentivised to provide illegitimate information. Consequently, they aim to mask their messages and cover their real intentions, which potentially reduces the validity of certain data points. Moreover, even if an organisation is not actively altering data, it can still use symbolic actions to diffuse its actual environmental performance. Thus, environmental researchers are challenged to distinguish between genuine attempts and intentional deception. This is further complicated by insufficient availability of third-party data; the publication of environmental performance data from organisations has only recently begun being institutionalised.[2] Without such policies scholars are prevented from cross-referencing the relationships with actual data and are forced to build causal inferences from perceived practices.

[2]One example is the 2020 EU legislation that requires large companies to disclose their social and environmental impacts (European Commission, 2022).

These challenges pose a certain obstacle for behavioural scientists to emerge into the field of corporate sustainability. Yet, they also offer promising opportunities given the comparative novelty of corporate behavioural sustainability. Echoing the third challenge, for instance, this doctoral dissertation aims to explore the concept and implications of symbolic corporate sustainability communication, which has found little attention in behavioural research. The concept builds on a seminal paper written by Meyer and Rowan (1977), which has been cited almost 40,000 times as of 2022. The authors posit that organisations can obtain legitimacy by adopting highly visible practices congruent with social expectations without altering their core business practices – a notion that is particularly applicable in a context of high public and emotional salience. It is fascinating that despite Meyer and Rowan's argument, most recent reviews of corporate sustainability do not mention legitimacy or misleading communication (Ashrafi et al., 2018; Bai et al., 2015; Siew, 2015), and those who touch upon the subject only briefly note "transparency and communication" (Engert et al., 2016) as a domain with significant gaps. None of these reviews specifically address symbolic or deceptive communication.

Notwithstanding, the criticism outlined above may also be distracting because it undermines the valuable contribution that behavioural science makes in providing a theoretical, empirically-based explanation of human motivation and interaction (Van der Linden, 2016). While the psychological heritage of most researchers leads to a focus on the characteristics and dynamics of individuals, researchers from other fields who study the articulation between the individual and broader economic, social, and political structures often disregard the acting or experiencing individual (Saegert & Winkel, 1990). This idiosyncrasy increased the awareness of and need for transactional approaches in contributing to cross-paradigm syntheses. In other words, climate change is an inherently interdisciplinary subject that demands an integrated effort (Lemos & Morehouse, 2003; Mauser et al., 2013). Cohen et al. (1998) propose that this distinction has arisen because of "the very different approaches to science, politics,

and practice associated with the separate discourses and research cultures" of these disciplines. This thesis follows the emerging trend of sustainability research and the notion that in order to provide theoretical and practical contributions to the field, research needs to integrate insights and methods from different disciplines (Henderson et al., 2015).

The current thesis is based on the premise that research at the nexus of these fields has the potential to considerably advance our understanding of this relationship. In fact, there is an increasing trend of publications in this research domain (Grewal & Serafeim, 2020), and both policymakers and corporations are realising the necessity to publish environmental performance data. This trend offers exciting opportunities for researchers to coalesce management or economics literature with policymaking and psychology. For instance, study 4, presented in chapter 6 of this dissertation, draws heavily on free and publicly available macro data on sustainable start-ups in Europe, provided by the European Statistical Office. In addition, the emergence of machine learning techniques and increasing adaptation in behavioural studies can provide another avenue to cope with illegitimate data.

1.3.2 Situating the current work

The above debate is important for situating the current work. Reflecting the heterogeneity of corporate sustainability research, the literature on communicating environmental advocacy is even more fragmented. Researchers from various academic disciplines and governmental institutions have addressed the question of how to encourage organisations to reduce their environmental impact. Contributions have come from disciplines such as sociology, organisational studies, economics, geography, environmental sciences, and psychology (Aykol & Leonidou, 2015).

While research into the technological and economic factors that contribute to environmental degradation has gained popularity in recent decades, we still know

very little about the psychological mechanisms underlying environmentally-conscious and sustainable corporate behaviours (Clayton & Myers, 2015; Gifford, 2011; Van der Linden, 2014). Much of what we currently know about the relationship between corporations and the environment has emerged from individual contributions (Lindenberg et al., 2012). Discussions of green workplace policies have primarily focused on the economic benefits, for example, job creation from new green industries (Payne et al., 2015; Wei et al., 2010), or health benefits, for example, from climate change mitigation policies that concurrently improve air quality (Dora et al., 2011; Van der Linden, 2014; Wade et al., 2013).

Scholars are being called upon to investigate how organisations can address the 'grand challenges' that humankind faces (George et al., 2016; Markman et al., 2019). Some of these grand challenges represent highly complex, global problems that are prone to contestation. The topic of corporate sustainability, which is central in today's agenda for corporate executives worldwide (Amran & Ooi, 2014; Teh & Corbitt, 2015; Unruh et al., 2016), is linked to the wider issue of sustainable development and the role of business in society. How best to design and implement effective organisational policies remains an open question. A full answer to this question is likely to be multi-faceted and involve contributions from researchers from different academic disciplines and governance and industry actors. The current thesis follows this notion. While the overall method is behavioural in nature, inputs are accumulated and adopted from across the cultural, environmental, and political spectrum. This perspective advances organisational and behavioural sustainability research by linking the two in a novel way.

The environmental psychology and corporate sustainability literature has been frequently criticised of lacking theoretical integration (Williams & Patterson, 1999; Winkel et al., 2009); this is reflected in both the variety of models and approaches used to explain and describe climate change communication as well as in terms of

systematically mapping the psycho-social determinants of mitigation behaviours (Van der Linden, 2014). For example, Aguinis and Glavas (2012) note that while it is now well known that people perceive corporate communication in different dimensions, few coherent attempts have been made to integrate behavioural science with corporate sustainability. To this extent, the current thesis provides a novel and comprehensive communication framework for illustrating and evaluating corporate communication in the context of sustainability. The issues surrounding the concept of corporate sustainability are complex and far reaching. Given its complexity, corporate sustainability requires a methodology that attempts to include various relevant perspectives into an inclusive and coherent theoretical framework (Christen & Schmidt, 2012).

This doctoral dissertation is broadly situated between two separate, yet closely related, contributions that behavioural science makes to the corporate sustainability discourse. Specifically, the primary theories in this thesis build on the common and well-studied social psychology constructs of identity, emotions, social and institutional hierarchy, and communication theories, including signalling and legitimacy theory. Thus, in comparison to other recent social-psychological publications that have explored, for example, the social representations theory (Smith & Joffe, 2013) or the larger socio-cultural meaning of the climate change debate (Capstick, 2012; Tanner & Allouche, 2011; Van der Linden, 2014), the overarching epistemological approach adopted in this thesis can be described as an 'integrated environmental psychology' approach (Farcy et al., 2013; Rajah et al., 2012). Furthermore, while corporate sustainability as a division of CSR has gained popularity as an academic subject (e.g., Castka & Balzarova, 2008; Delmas & Montes-Sancho, 2010; Terlaak, 2007), most investigations assume genuine environmental ambitions. Studies on the intersection of communication and deception within sustainability remain scarce and fragmented. In fact, there is currently no systematic review on the subject of legitimacy in corporate sustainability claims (Moratis, 2017), let alone an attempt to develop a

comprehensive communication framework that builds on the notion of deceptive or symbolic sustainability communication.

1.4 Thesis outline

1.4.1 Scope and goal of the thesis

The overall goal of this doctoral dissertation is to empirically investigate the legitimacy of corporate sustainability claims. Through the lens of signalling and legitimacy theory, it aims to advance our understanding of symbolic climate change communication in organisations.

The motivation behind the theme of corporate sustainability communication originates in the current challenges surrounding strategic transformation and the absence of behavioural research in the corporate sustainability literature, as outlined in the previous sections. By illustrating the challenges companies face and the opportunities that arise during this transition, this thesis presents a business case for organisations to embrace environmental change. Managers, business owners, and policymakers alike are often overwhelmed by the complexity of the issue (Ferdig, 2007; Savage et al., 2015), resulting in paralysis or an inability to start. This dissertation illuminates corporate sustainability communication in four different contexts and situations to address this complexity. By strategically varying sustainability claims 'within' and 'outside' of the organisation as well as via 'top-down' and 'same-level' communication, the results aim to align behavioural theories and methods with actual and relevant data to systematically identify effective policymaking strategies surrounding corporate sustainability.

It will be shown that for most firms such a transformation entails senior leadership first articulating and shaping the organisation's objectives and purpose

before moving on to implementation strategies and operations. In essence, a strategic transformation demands systemic change that extends well beyond symbolic actions. Re-configuring an organisation's DNA is challenging, but this dissertation proposes that by demonstrating how successful organisations have driven systemic change, others can follow and adapt these methods to their transition plan and achieve legitimate environmental advocacy.

Theoretically, this thesis advances a more integrated, systematic, and comprehensive social-psychological understanding of corporate sustainability in a wide range of organisations and, as such, is likely to help increase the saliency of psychological research in the mitigation debate (Klöckner, 2013; Van der Linden, 2014). Especially given the increasing call for more theoretical, evidence-based public policies (Gifford, 2008), a thorough understanding of the differences between symbolic and substantial environmental advocacy that shapes and influences climate change perceptions, appraisals, and subsequent behaviours are likely to assist organisations and policymakers in genuinely communicating more effectively about climate change and allow them to create better-targeted, informed behavioural change interventions.

1.4.2 Methods

Drawing conclusions about organisational behaviour and helping companies to engage in effective sustainability communication is unlikely to succeed if such results are not grounded in solid behavioural research (Pidgeon & Fischhoff, 2011). Consequently, this dissertation contains various methods ranging from experiments and field studies to third-party database analyses and machine learning techniques. Arguably, relying on a single method would be insufficient for addressing all the different reasons why, how, and where organisations and their leaders recognise opportunities in response to grand challenges. This thesis uses a flexible methodology that allows for a holistic examination of effective communication. Adopting different methods to study

a phenomenon also increases the reliability of findings and allows for triangulation, which describes the ability to confirm a similar explanation of a hypothesis using multiple different methods (Shepherd, Oliver, et al., 2015). Thus, a mixed-methods approach is adopted in this dissertation.

The database analyses, in particular, touch upon a relatively novel trend in behavioural research: The use of big data and machine learning analyses (Jordan & Mitchell, 2015; Mehta et al., 2019; Yarkoni & Westfall, 2017). While traditional experimental studies usually test a controlled number of variables and participants, modern studies increasingly leverage the availability of large data sets. The rationale for these methods is grounded in the inability of conventional methods such as variance analyses to process large amounts of data and find coherence without specifications (i.e., unsupervised learning). Part of this dissertation thus ventures beyond traditional methodologies by being amongst the first to use a text-mining technique called 'latent Dirichlet allocation' (LDA) in behavioural corporate sustainability research.[3]

Going beyond traditional methods offers scholars and researchers the opportunity to apply and adapt this burgeoning approach to their research thus further making a methodological contribution to the field. This linkage may also highlight the importance of a role we might call the 'social data scientist' (Van der Linden, 2016). Such a role would address the increasing need for social businesses to credibly measure and communicate social impact by implementing rigorous quantitative evaluation methods that are operationally lightweight and non-intrusive, thanks to the possibilities offered by new technology.

Conceptually, this thesis can be structured in a 2×2 matrix (see Figure 1.1). The x-axis distinguishes between studies considering communication processes 'within' an organisation and studies focusing on 'external' stakeholders. On the y-axis,

[3]Notably, some recent attempts have been made (see, e.g., Chen et al., 2019; Raghupathi et al., 2020; Székely & vom Brocke, 2017).

the studies can be divided into 'top-down' and 'bottom-up' considerations. More specifically, study 1 focuses on internal stakeholders across the entire hierarchy. Study 2 also follows an internal perspective but primarily focuses on top leadership teams (i.e., C-suite). These two studies can be considered reactive since employees and managers are already working in the company. In contrast, studies 3 and 4 are proactive and focus on the attraction of prospective talent or entrepreneurs. The internal–external dichotomy is prevalent in and inspired by existing corporate sustainability literature as it is crucial to not limit corporate strategies to a single domain and rather analyse how firms interact within their organisation and with the external environments in which they operate, such as the economy, society, or legislative frameworks (Buyl et al., 2015; Corbett et al., 2018; Milne & Gray, 2013).

The studies can further be categorised by their experimental design. The studies highlighted in blue represent experimental manipulations following a traditional design. Variables are controlled experimentally, and the results focus on variance analyses and interaction effects. The studies marked in green take third-party macro data as the primary data source. The focus lies on identifying economic trends, and given the large number of variables, the outcomes are drawn from ordinary least square (OLS) regressions and LDA analyses.

Lastly, this dissertation addresses the importance of cross-cultural research. By working closely with a start-up incubator in Germany and a human-resources (HR) consultancy in China, the studies cover a wide range of demographics and cultural backgrounds. All empirical studies in this dissertation recruited actual industry experts (such as job seekers or employees of an actual company) rather than students or participants via online tools. Moreover, environmental behaviour is measured directly as opposed to behavioural intentions or hypothetical scenarios.

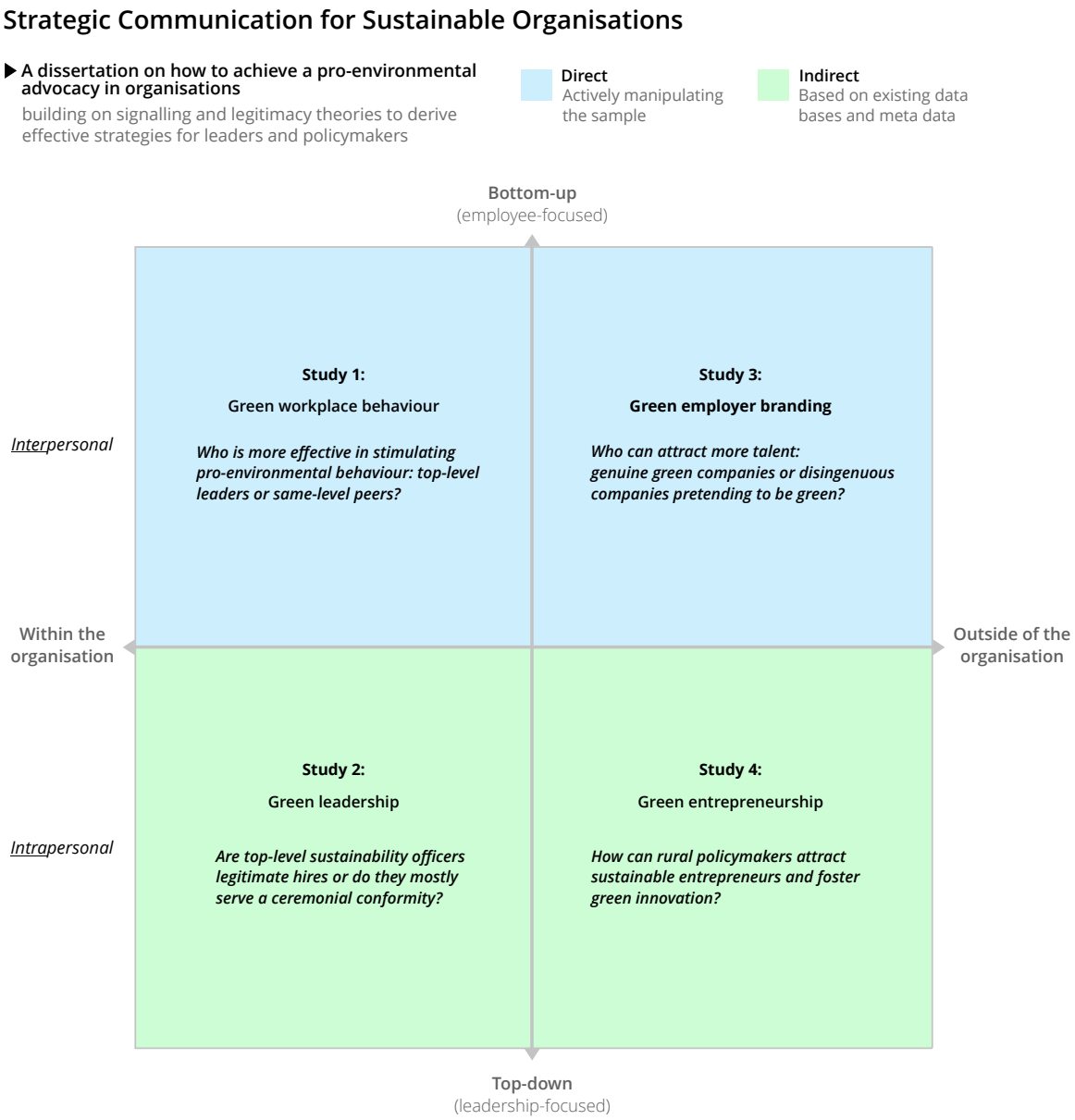

Figure 1.1: Structure of the thesis.

1.4.3 Structure of the thesis

This thesis consists of a collection of four independent but related papers, which (together with the introduction, theory, and general discussion) are presented in seven consecutive chapters. The first chapter of this dissertation serves as the general

introduction and thesis outline. Chapter 2 reviews the current literature on corporate sustainability and provides the necessary definitions and theoretical basis for the empirical chapters. Because each of the empirical chapters also includes a review of the relevant literature, chapter 2 provides a wider context by reviewing previous studies and identifying theoretical and methodological gaps in the literature. Specifically, section 2.1 exemplifies the etymology and history of corporate sustainability and contrasts the term with related theoretical concepts. Section 2.2 shifts the theoretical outline to the core topic of this thesis by presenting the prevailing approaches to climate change communication and introduces the two primary theories that this thesis draws from. The third section in chapter 2 identifies the relevant gaps in the current literature and derives the research questions that the empirical chapters in this thesis address.

As the first empirical paper, chapter 3 presents an explorative study on leadership and climate change communication. Overall, the chapter outlines the role of power and emotions in organisations. The findings imply that leaders are more effective in stimulating pro-environmental behaviour than low-level employees as they utilise their status and network to facilitate their messages and use emotional appraisals to address employees' environmental identity. This result highlights the importance of power and top-down communication and thus provides an important foundation for the following studies.

To further narrow down the impact of leadership in corporate sustainability issues, the following chapter investigates a novel trend in corporate leadership practice. Rather than using Chief Executive Officers (CEOs) as a proxy for powerful individuals (see study 1), the second empirical study examines the appointment of a Chief Sustainability Officer (CSO). The career histories and skills of 10,007 chief executives and sustainability experts from 29 countries were examined by parsing granular CV data through an unsupervised machine learning algorithm. Theoretically, the study explores the concept of ceremonial conformity, which describes the notion of hiring

a sustainability executive to signal environmental alignment. The chapter therefore links leadership with legitimacy theory in environmental contexts.

The concept of legitimate communication is also the topic of chapter 5. Situated in the intersection of marketing and HR, the study presented in this chapter, possibly for the first time in the literature, transfers deceptive green marketing (i.e., greenwashing) onto employer branding. By designing several experimental field studies and using actual job seekers in China, this chapter extends signalling theory and disingenuous communication to the recruiting domain.

The final empirical chapter speaks to the questions of why and where green entrepreneurs start a business and how policymakers can incentivise the creation of sustainability hubs in their region. Echoing the findings of chapter 4, this study proposes that managing sustainability projects necessitates not only rigid, hierarchical leadership but also the ability to incorporate pluralistic leadership and dialectical change, as well as the ability to switch between these strategies as support for sustainability projects shifts over time. The chapter investigates the policies surrounding green entrepreneurship by identifying the areas where sustainable entrepreneurs tend to congregate and then describing the reasons behind this clustering. The chapter gives a general overview of where and why sustainable business prospects are most likely to emerge in Europe. Contrary to the previous studies that examine intra- and interorganisational interactions, chapter 6 takes a macro-perspective and provides theoretical and practical implications for policymakers rather than organisational leaders.

Chapter 7 concludes the thesis and considers its main contributions, lessons learned, and limitations. It explains how each of the empirical chapters contributes to answering the central research question and summarises the results by introducing a novel communication framework. Furthermore, it provides a set of theoretical and

practical implications for the research as a whole. The chapter critically reflects the use of signalling and legitimacy theory and discusses implications for future research.

2 | Review of past research and an agenda for the future

Chapter 2 provides the theoretical and conceptional foundation for this dissertation. The goal is to present the taxonomy of corporate sustainability concepts whilst providing a logical link between essential communication theories and practical applications in the field. The first section briefly outlines the history of sustainability in organisations before exploring the idiosyncrasies and definitions of modern corporate sustainability. The section further defines what constitutes a sustainable organisation and how communication is commonly integrated as a business strategy. The second section focuses on legitimacy, the core theme of this dissertation. Two essential theoretical concepts, namely legitimacy and signalling theory, are presented. Building on this, the section critically reflects the importance of corporate legitimacy in an environmental context and explores ways to enhance credibility. By highlighting the need for further research on three different levels (micro, meso, and macro), the third section of this chapter derives the essential research questions and lays the foundation to develop a comprehensive framework for sustainability communication in organisations. The chapter concludes by summarising the research questions.

2.1 Theoretical perspectives and definitions

2.1.1 A brief history of corporate sustainability

"You can't cut down the forest and leave the echo."

– Richard Schröder, *German philosopher*

One of the first manifestations of sustainability was coined by Hans Carl von Carlowitz in 1713. At that time, wood was considered the most important raw material, which was not only used for construction and shipbuilding but was also an essential source of energy for cooking and heating. This demand resulted in the deforestation of large areas in Europe. Given that wood is a finite resource, a critical question emerged: How can the utility of natural resources be maximised without risking degradation?

According to Carlowitz, the answer was a method that achieves the highest yet most permanent timber yield from the forest. Simply put, people should only fell as many trees as will grow back naturally. In doing so, he laid the foundation of 'sustainability'. His consideration has shifted the status quo by focusing on the proceeds of a substance, not on the substance itself. Around the mid-19th century, the theory of 'net yields' further gained popularity and soon became the guiding principle of permanent, sustainable returns on investment.[1]

The discussion about the relationship between ecology (natural resources) and economy (growth) intensified in the second half of the 1900s. The United Nations Environment Program (UNEP) was founded in 1972, raising awareness that the basis of human life is threatened. Scholars and activists warned in no uncertain terms that pursuing exponential growth without drastic changes would have dramatic

[1] Example adapted from Pufé (2012).

consequences for the world population and the planet's flora and fauna. In the broadest sense, constant growth is self-destructive.

One of the first manifestations in economic literature was formulated by economist Howard Bowen. In his book 'Social Responsibilities of the Businessman' (Bowen, 1953) he emphasises the significance of morality in how a corporation interacts with society and the role of moral behaviour towards stake- and shareholders (Taticchi & Demartini, 2020). This notion was considered radical as considerations of corporate philanthropy, stewardship ideals, and ethical standards were rather unusual during that time. The primary role of companies was to maximise shareholder returns (Friedman, 1970; Levitt, 1958). Yet, with wealth increasing and technology improving, organisations have started to consider factors that go beyond shareholder profits. Economists and practitioners started to adopt several concepts that make a company more competitive and increase overall welfare; one of these ideas is referred to as 'corporate sustainability'.

Towards the end of the 20th century, scholars have identified three primary components of sustainability: An ecological, economic, and social dimension. Accordingly, sustainability or sustainable development can be classified as the linkage between economic, ecological, and social goals. While initially presented under the term 'three-pillar model', today's descriptions of sustainability are typically aligned with the normative concept of the 'triple bottom line' (Elkington, 1998). The original cost accounting approach 'one bottom line' (Gupta et al., 2020) was expanded to include two additional bottom lines: The social and the ecological bottom line (see Figure 2.1).

The modern understanding of corporate sustainability predominantly builds on this concept. Drucker (1984) defines the role of corporate sustainability as a way to address social problems while perpetuating economic interests and securing well-paid

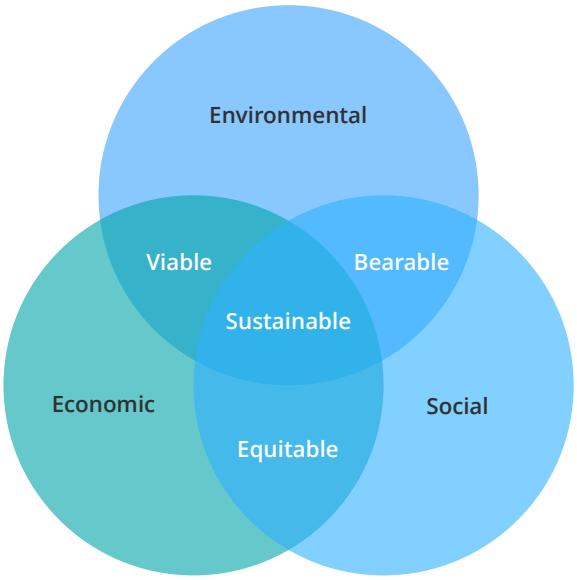

Figure 2.1: Elkington's triple bottom line illustration.

jobs and overall wealth (Camilleri et al., 2017). Drucker further noted that companies cannot focus on only one goal to achieve success, whether this is economic welfare or social goods. Since then, people have discussed what role business can and should play in society, as well as how businesses can and should contribute to sustainable development.

Given the broad history, the definition of sustainability and the management techniques have altered over time. According to Camilleri (2017), three crucial phases can be identified. The first one is the emergence of CSR (1950–1990). The second phase is the progression of corporate sustainability and the establishment of the triple bottom line concept (1990–2005). The current phase can be described as the emergence of modern corporate sustainability resulted due to the establishment and prevalence of novel concepts, for example ESG (Environmental, Social, and Governance) in the financial sector (2005–now).

Overall, the themes of corporate sustainability have attracted much interest, to the extent that companies developed functional departments devoted to them. In

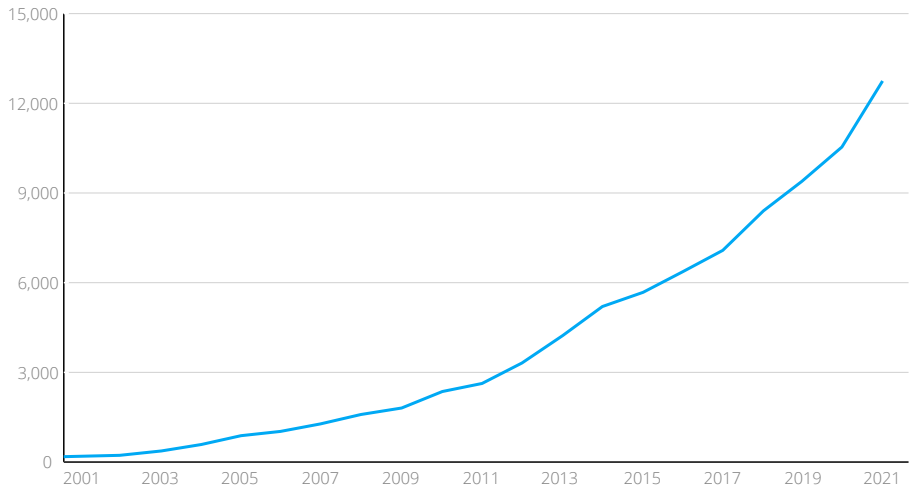

Figure 2.2: Graph showing Google Scholar results by year for the search term 'corporate sustainability'.

the last two decades alone, we have seen a variety of concepts, such as the triple bottom line, become widespread in corporate lingo, influencing present concepts of corporate sustainability. Academically, scholars and researchers have created scientific fields and courses on the subject, and the number of publications on corporate sustainability has tripled over the past decade (see Figure 2.2).

2.1.2 The determinants of modern corporate sustainability

Modern corporate sustainability as a link between organisations and the environment progressed from altruistic endeavours to value creation. Specifically, companies have realised the potential of sustainable technologies to create customer value and increase income. Thus, corporate sustainability has become an integral part of the business strategy in many companies. It challenges many of the principles underpinning the role, structure, and functioning of corporate governance. According to Signitzer and Prexl (2007), mainly amongst larger companies, tools such as triple-bottom-line accounting, sustainability balanced scorecard, life-cycle assessment, ESG-reporting, eco-efficiency, and environmental information and management systems

have been implemented to make business processes more sustainable (or to put it more in line with the triple bottom line, *economically* viable, *socially* responsible, and *environmentally* sound).

On a more practical level, the field has progressed from improving operating costs and compliance to becoming a competitive driver of company strategy (Morrison, 2003). Compared to earlier concepts of corporate sustainability, which were mostly compliance focused and thus considered reactive, the modern approaches consider sustainability as an assertive and proactive strategy (Taticchi & Demartini, 2020). Another way to conceptualise modern corporate sustainability is that it has evolved from being project focused, with the goal of demonstrating good will, and quality focused, with the goal of improving operational efficiencies, to strategically oriented, with the goal of identifying key firm opportunities and creating a dynamic network of strategic relationships (Kiron et al., 2017). Lastly, rather than interacting with stakeholders transactionally, strategic sustainability integrates values, skill sets, and organisational learning holistically and recognises the significance via continuous multi-stakeholder engagement (Gareis et al., 2013).

This transition towards value creation leads to a wide range of concepts and strategies. Consequently, there is a considerable gap between theoretical concepts and practical implementation of sustainability measures in corporate settings (Bridges et al., 2017; Taticchi & Demartini, 2020). The resulting ambiguity in the terminology promotes segmentation and complicates evaluating performance outcomes between industries. Environmental performance, for instance, can be measured using emissions of greenhouse gases, water consumption, waste production, or compliance with the International Organisation for Standardisation (ISO) standards (Dovekalova et al., 2015). However, ambiguity is not always a problem. Not having a clear or universal definition allows businesses to co-create a tailored sustainability vocabulary with their

employees and partners and respond to a continuously changing market with individual approaches and new ideas.

2.1.3 Defining sustainable organisations

This variety of taxonomies and metrics has also diffused the description and classification of sustainable organisations (McWilliams & Siegel, 2001). Generally, every company can apply sustainable practices and subsequently can to some degree be defined as sustainable or green. Echoing the definition of modern corporate sustainability introduced above, the range of characteristics can vary from intangible characteristics, such as environmental awareness and creating a surrounding where employees can interact and engage with climate actions (Boiral, 2003; Boiral & Roy, 2007; Christmann & Taylor, 2006), to measurable and recognised implementation of environmental standards and regulations, such as ISO 14001. Other voices propose that an organisation can be considered green when it explicitly states sustainability as a value-creation narrative. For example, sustainability can be articulated in a long-term mission statement, a code of conduct with specific expectations and standards, or in an execution plan that develops new organisational abilities and advantages (Camilleri et al., 2017; Morrison, 2003; Rossi et al., 2020). The most common definition of sustainable companies seems to describe firms that consider sustainability as a deliberate strategy to satisfy stakeholder expectations while considering environmental, social, and economic aspects (Fadun, 2014; Mahmood & Humphrey, 2013).

2.1.4 Defining sustainability communication

The goal of this dissertation is to examine and integrate the recent research on corporate sustainability communication to provide important insights into how organisations communicate more effectively with various stakeholders about their environmental operations. Corporate sustainability communication first emerged as a

component of CSR research in the 1980s (Bruning & Ledingham, 1999; Dawkins, 2004; Golob et al., 2013; Lewis, 2003; Manheim & Pratt, 1986; Morsing & Schultz, 2006). Since then, many concepts have emerged, and listing all theories on the subject would go beyond the scope of this dissertation. However, one perspective on operationalising corporate sustainability communication is internal versus external communication. Internal communication happens when sustainability-related topics are conceptualised, identified, debated, planned, implemented, amended, and terminated inside companies. The main actors are typically stakeholders who are closely related to the organisation, such as employees and shareholders. The goal is to reduce uncertainty around the word 'sustainability' and to develop sustainability goals in dyads, small groups, and across the organisation via mediated and non-mediated verbal and non-verbal communication. Internal communication on the topic of sustainability can also serve as a platform for environmental learning and change processes within the company and, as a consequence, become a catalyst for innovation and competitiveness.

External communication has several applications. From a marketing perspective, climate change communication aims to enhance the sales of sustainable products. Marketing can also contribute to the broader organisational goals of sustainability management (i.e., image improvement and fulfilment of customer and shareholder demands). Closely related to marketing, public relations (PR) can further improve the organisation's image and obtain a 'licence to operate' (Parsons et al., 2014). Licence to operate refers to enhancing trust and credibility among stakeholders by positioning the company as a sustainable organisation with viable products. Another form of external communication is lobbying. Climate change communication has the potential to solicit new environmental regulations in a domain relevant to the organisation. Lastly, sustainability communication can enhance financial evaluations. Particularly for larger public companies, investor relations become increasingly important with financial rankings, such as the Dow Jones Sustainability Group Index, defining the flow of capital, interest rates, and insurance conditions (Sánchez, 2000; Tulchin, 2005). In

summary, external communication can be an essential tool to improve PR, perceived credibility, social legitimacy, and investor relations (Balmer et al., 2007; Balmer & Greyser, 2009; Gray & Balmer, 1998; Hoeffler & Keller, 2002; Vanhamme & Grobben, 2009; Waeraas & Ihlen, 2009).

Overall, corporate communication is a broad term that can be applied to a variety of corporate objectives (Argenti, 1996). While most studies focus on the broader idea of corporate reputation, their results have immediate consequences for this thesis since corporate reputation is linked to attitudes about the organisation, brand, and job-seeking intents (see, e.g., Klimkiewicz & Oltra, 2017; Melo & Garrido-Morgado, 2012). For this dissertation, corporate sustainability communication is defined as all the ways that a company expresses its ecological impact and role in facing environmental challenges (Zerfass, 2008). Given the wide range of contexts in which corporate communication is explored in this thesis, the term may be used interchangeably with marketing, branding, PR, and investor relations.

2.1.5 Integrating sustainability as a core business strategy

Environmental strategies can vary greatly. They can be implemented at different levels of a company's structure, and they can be voluntary or required; short, medium, or long term; and directed at a variety of goals (increasing profits, combating climate change, signalling conformity). One frequently used concept is called the ESG-framework (Drempetic et al., 2020). ESG is an acronym referring to environmental, social, and governance.

Firstly, the *E* in ESG, *environmental criteria*, considers the extent to which a company or state pollutes the environment, emits greenhouse gases, consumes resources, or uses energy efficiently. A company's dealings with such environmental characteristics can be reflected in various standards. For example, the environmental

management systems ISO 14.001 or the Eco-Management and Audit Scheme (EMAS) indicate whether a company systematically measures and controls ecological indicators.

Moreover, the *S*, *social criteria*, covers a company's interactions with individuals and organisations in the places where it operates, as well as its image in those locations. The main focus lies on the company's social commitment and role in society. Internally, the working conditions in the company are considered, e.g., diversity in teams, occupational safety, and health protection. Externally, the value chain is considered, including compliance with human rights at suppliers or the ban on child labour.

Lastly, the *G*, *governance*, is usually related to responsible corporate management and includes fairness and transparency. Company guidelines and codes of conduct regarding corruption and cooperation between diverse interacting parties are considered in this context. Transparent information on these topics is supposed to improve company evaluation for regulators or investors.

This thesis defines modern corporate sustainability strategies as the culmination of several concepts and measures that have arisen since 2005 and now drive current thought. For the purposes of this dissertation, corporate sustainability is conceptualised as an evolving management concept that poses an alternative to the traditional models of immediate wealth maximisation (Keay, 2008; Signitzer & Prexl, 2007). Yet, it is important to note that a completely sustainable company does not, or cannot, exist as corporate sustainability is conceptualised as a process of permanent improvement (Paech & Pfriem, 2004; Signitzer & Prexl, 2007). As a result, it is described as a relative notion that refers to the strategic and planned management actions taken to achieve a balance between values and goals that are related to the economy, society, and the environment.

2.2 Legitimacy in environmental contexts

2.2.1 Legitimacy theory

Legitimacy can be defined as the belief or sense that organisational activities are acceptable, suitable, or adequate within a socially built system of standards, ethics, opinions, and concepts (Suchman, 1995). Simply put, the viability of a company depends on its ability to live up to and comply with the expectations, boundaries, and norms imposed by society.

Legitimacy theory proposes a 'social contract' that exists between a business and its stakeholders (Deegan, 2006). This social contract considers whether a company performs within society's upper bounds and norms or just meets minimum expectations. The terms of this agreement can be both explicit and implicit. Explicit terms are legal responsibilities, whereas implicit terms are communal norms (Deegan et al., 2000). Moreover, a central aspect of legitimacy theory is the concept of the 'licence to operate', which has briefly been mentioned in the previous section. This licence is a form of permission that companies receive from society. If companies are no longer accepted as members of society, for instance, by violating the social contract, stakeholders can withdraw their licence. It is imperative for an organisation to uphold these terms in order to maintain societal legitimacy and ultimately to sustain the financial momentum behind their efforts.

Apart from these core principles of legitimacy theory, it is important to note that the concept is constantly evolving. According to two of the main contributors to the theory, Donaldson and Dunfee (2000, 2002), the social contracts between companies and society are evolving concepts that differ in their principles, culture, and time in which they were drafted. Building on this, the appraisal by stakeholders can differ greatly. Notably, this can be problematic as organisations have very different

stakeholders, including customers, suppliers, competitors, employees, investors, and legislators. Organisations thus have to meet very different, possibly incompatible, social values, norms, and expectations. Due to the complexity of the construct, it can be assumed that legitimacy has contextual meanings that merit interpretation on a case-by-case basis.

Since its early conceptualisations, numerous researchers have studied the theory (see, e.g., Dube & Maroun, 2017; Fernando & Lawrence, 2014; Guthrie & Parker, 1989). To bring clarity to the topic of legitimacy theory, Suddaby and colleagues (2017) reviewed the literature based on the question of what legitimacy is. The review found three schools of thought: a) legitimacy as property, b) legitimacy as a process, and c) legitimacy as perception. The first sees it as a resource that matches attributes of an organisation with external expectations. The second sees it as a social construct that occurs through deliberate efforts. The third sees it as a form of evaluation and social judgement, being created between organisations and individuals in how they see and judge the actions of each other.

2.2.2 Signalling theory

The second core theory used for sustainability communication is signalling theory. The concept builds on the idea that stakeholders form perceptions of companies based on incomplete information (Macan et al., 1994; Richman-Hirsch et al., 2000; Rynes & Miller, 1983; Smither et al., 1993). The theory has been widely used, for instance, as a tool to convey and enhance corporate image and attract employees, investors, clients, and strategic partners (for a review, see Connelly et al., 2011). To further explain the concept, signalling theory will be explained using the example of talent attraction in the following.

Signalling theory assumes that prospective employees generate impressions about employers based on insufficient information they receive during the hiring

process (Rynes & Miller, 1983). Job seekers strive to align their assumptions of future employers with the firms' offers and interpret signals as predictors of future employment relations (Wanous et al., 1992). Working conditions and firm characteristics, such as work environment, culture, and moral values, are communicated through direct and indirect signals that are evaluated by individuals (Jones et al., 2014; Turban & Greening, 1997).

A primary source of information is job descriptions, which create an image that is shown to impact a company's capacity to attract applicants (Macan et al., 1994; Richman-Hirsch et al., 2000; Smither et al., 1993). The theory states that recruiters and other corporate agents convey information throughout the recruitment process and thereby portray an image of what it is like to work for the company. Moreover, signalling theory provides support for exploring the connections between attitudes towards sustainability and employer attractiveness (Backhaus et al., 2002; Jones et al., 2014; Tsai et al., 2014).

It is important to note that aside from signalling theory, social psychology has identified several other constructs that potentially explain the effects of employer branding. One example is the elaboration likelihood model (ELM), which is a dual-process theory of communication and persuasion. It explains how people process and respond to persuasive messages based on their own motivation and cognitive abilities (Petty & Cacioppo, 1986). According to Theurer and colleagues (2018, ELM can be applied to employer branding by examining how job seekers process job advertisements through either the central route (careful, systematic evaluation) or the peripheral route (relying on heuristics or superficial cues). Understanding these different routes can help researchers uncover the cognitive mechanisms that attract job seekers.

Critically, however, the ELM and signalling theory differ in their focus and application. While signalling theory focuses on the communication of hidden

attributes to reduce information asymmetry, ELM emphasises the cognitive processes and persuasion mechanisms that influence how individuals evaluate and respond to marketing messages. While both theories have been used for the study of employer branding, the studies in this dissertation are primarily concerned with the outcome of the decision, not the process itself. Moreover, in the context of greenwashing, which is a communication technique of intentionally hiding information, signalling theory is considered more suitable as it specifically analyses the perception of hidden attributes, actions, or characteristics to reduce information asymmetry between parties.

A second theory that could be applied in this context is cognitive dissonance theory. It posits that individuals experience psychological discomfort when they encounter conflicting beliefs, attitudes, or behaviours, and they are motivated to reduce this discomfort by modifying their beliefs or actions (Festinger, 1962). In the context of employer branding, cognitive dissonance could be relevant when aiming to study the factors that lead to job seekers changing their perceptions of an organisation, or how they reconcile discrepancies between their initial expectations (e.g., on environmental performance) and the reality of working for a company. However, this approach might be more relevant for studies looking at the post-employment stage or studies that specifically analyse the psychological factors that influence job seekers' decision-making processes.

Several studies explored the relationship between environmental branding and employer attractiveness using signalling theory. However, most studies take sustainability signals at face value (e.g., Backhaus et al., 2002; Jones et al., 2014; Tsai et al., 2014). Signalling corporate values, at its core, builds on the notion that appraisals are made implicitly. Critically, the information asymmetry between the two parties also allows organisations to potentially convey disingenuous or misleading information. How job seekers interpret these signals and whether they are able to

discern inauthentic sustainability communication becomes one core question of this thesis (more on this in section 2.3.3).

2.2.3 Why do companies need to obtain legitimacy?

Gaining legitimacy is particularly important in creating favourable impressions of an organisation (Bansal & Clelland, 2004; Bebbington et al., 2008). A fundamental aspect of legitimacy theory is that no organisation has an inherent right to exist and that organisations need legitimacy to prove their place in society and gain access to resources (Deegan, 2002). Even when faced with negative events, such as environmental disasters, deliberate disclosures are a useful tool in regaining legitimacy (Cho, 2009). Specific to environmental advocacy, legitimacy offers organisations the chance to create their own narrative in reducing information asymmetries and conveying their environmental performance.

These theoretical considerations have found extensive empirical support. Several studies reaffirm the notion that corporate sustainability has – at least in some cases – a favourable influence on workplace attractiveness. Specifically, independent sustainability rankings as a measure of environmental performance are positively related to employer attractiveness amongst business students (Albinger & Freeman, 2000; Greening & Turban, 1996). Lin et al. (2012) used Carroll's (1979, 1991) four CSR dimensions to teach business students in Taiwan how to evaluate firms' CSR performance. The researchers were able to chart a positive relationship between performance and desirability as prospective employers in all four cases. Lin et al. (2012) further differentiated between environmental responsibility, diversity, labour standards, and employee engagement and discovered that diversity and labour relations had a higher impact on perceived institutional appeal than the other aspects. Similarly, Story et al. (2016) distinguished between external (related to stakeholders outside the

organisation) and internal (related to stakeholders within the organisation) CSR and found that only internal CSR boosts organisational commitment directly.

Another reason for studying legitimacy in an environmental context revolves around the unique nature of environmental actions. Environmental attitude and behaviour are inherently intrinsic and value driven (Afsar et al., 2016; Tabernero & Hernández, 2011). As exemplified in the introduction, most climate actions require effort (e.g., taking the bike to work), are costly (e.g., purchasing organic food), and are difficult to enforce (e.g., recycling). Simply dictating appropriate actions will not lead to the desired behaviour (Kollmuss & Agyeman, 2002). Convincing individuals to be pro-environmental requires emotional contagion and the ability to evoke intrinsic motivation (Hatfield et al., 2014). Messengers, such as organisational leaders, need to act as role models by creating a moral status quo. Illegitimate leaders may not reach the necessary level of credibility to evoke these desirable behaviours.

In a similar vein, environmental actions generally have no immediate or visible impact (Bratt, 1999). The opacity of environmental progress forces messengers to build their arguments on hypotheticals. Scholars have pointed out that cynicism, suspicion, and mistrust towards green initiatives are rooted in the structural misalignment of sustainability claims and actions (Becker-Olsen et al., 2006; Laufer, 2003; Ramus & Montiel, 2005) and symbolic rather than substantive corporate sustainability implementation (Christmann & Taylor, 2006; Marquis & Qian, 2014; Perez-Batres et al., 2012). Building a credible narrative can increase argumentative power.

Lastly, the advantages of presenting oneself as pro-environmental have led some organisations to misuse sustainable communication to create an illegitimate green image. Also referred to as 'greenwashing', this practice has further amplified scepticism about sustainability claims. Organisational legitimacy, therefore, becomes an important

factor in facing accusations of improper practices and creating an authentic corporate reputation.

2.2.4 Strategies for enhancing the credibility of corporate sustainability claims

Sustainability communication requires a certain level of credibility (Coombs, 1992; Lock & Seele, 2016). In turn, credibility serves as a foundation for trust and legitimacy (Coombs, 1992). A "credibility-perception gap" (Dando & Swift, 2003) exists when there is a misalignment between what stakeholders anticipate and what organisations do, or rather what they consider companies to do (Sethi, 1975). This gap becomes particularly challenging when sustainability communication is considered authentic or trustworthy in the eyes of the firm and its management but is seen as untrustworthy by stakeholders (Lock & Seele, 2016). Building on this controversy, economists have investigated legitimacy theory in an attempt to answer how to increase legitimacy of sustainability initiatives. The following section reviews the burgeoning literature on ways to increase legitimacy covering various angles, including leadership and stakeholder engagement as well as symbolic and deceptive communication practises.

To achieve legitimacy in sustainability claims, according to Kates (2004), organisations need to promote stakeholders' objectives (pragmatic legitimacy), social obligations (moral legitimacy), and cultural understanding (cognitive legitimacy). Aerts and Cormier (2009) further emphasise that strategic legitimacy is achieved by developing a deliberate management approach devoted to making strategic decisions to change a company's legitimacy status and develop resources through corporate actions, such as modifying its operations and influencing attitudes. This feature allows businesses to manage intentionally and deploy symbols in order to acquire acceptance in society (Ashforth & Gibbs, 1990; Dowling & Pfeffer, 1975; Suchman, 1995).

Thus, to achieve legitimacy amongst sustainability claims, an organisation needs to combine social expectations with a strategic plan. This conclusion builds on Habermas's (1984) communicative action theory. Habermas conjectures that strategic approaches appeal to rational actors, and communicative action helps in reaching a mutual understanding on the matter. Habermas (1987) later goes on to argue that communication is a process based on a set of norms, or validity standards, accepted by all parties involved to develop and maintain a correct and ideal communication process. According to Balluchi et al. (2020), the main principles in a communication process encompass various aspects that contribute to effective communication. One crucial aspect is understandability, where the communicator ensures that their message is easily comprehensible by the audience. Another essential principle is honesty, which emphasises the importance of conveying accurate and authentic information without intentionally providing false details. In addition, sincere expression plays a significant role in establishing the communicator as both sincere and trustworthy while presenting messages objectively. Lastly, appropriateness is a key factor in tailoring communication to the social context of the audience, taking into account both the normative and legislative aspects of the social order.

The quintessence of Habermas's considerations is that organisations do not work in a vacuum. Stakeholder perceptions have an important influence on the appraisal of sustainability communications (Lock & Seele, 2016). To gain credibility and obtain legitimacy, all four of Habermas's principles need to be considered, evaluated, and tailored to the audience (Lock & Seele, 2015, 2016).

Legitimacy through leadership

Legitimacy is a fundamental concept in leadership theory and has become a key prerequisite for a leader's capacity to wield power and influence constituencies (Tyler, 2006). When a leader's authority is perceived as both genuine and justified,

people are more likely to follow (Tyler, 2006). This even applies to the extent to which followers grant leaders the ability to decide what is right and wrong (Kelman & Hamilton, 1989) and willingly obey leaders in their act to surpass ethical conventions. However, when leaders are unable to convey their legitimacy persuasively, followers are likely to question their authority.

Considerable research has found that demonstrating integrity, reliability, competency, equality, and expertise increases a leader's legitimacy (Ratcliff & Vescio, 2018; Tyler, 2006). Linking leadership legitimacy with environmental advocacy, it becomes clear that legitimate leaders are better positioned to evoke favourable green behaviours. In fact, environmental actions are mostly voluntary, which requires individuals to develop an intrinsic motivation to transcend the barriers of potentially easier but more unsustainable behaviour. Examining a leader's perceived legitimacy therefore becomes particularly important in the study of environmental advocacy.

Legitimacy through stakeholder engagement

Legitimacy theory explains how businesses adopt corporate sustainability practices to comply with social expectations (Porter & Kramer, 2006). One branch of this theory was incorporated into the literature to answer how sustainability issues are formulated to address their external stakeholders (Gómez-Carrasco et al., 2021; Magness, 2006). This operational interaction between a company and its environment was corroborated by Kechiche and Soparnot (2012), who found that external stakeholders are even more important in achieving sustainability transformations than internal policies.

It should come as no surprise that organisations in today's economy do not operate in a vacuum. Firms must recognise the interests of stakeholders and cater to their audiences (Donaldson & Dunfee, 2002; Perrini, 2006). This focus on stakeholder expectations has also shifted the theoretical landscape. As noted by Perrini (2006),

scholars are now linking stakeholder theories with other constructs, such as legitimacy, emphasising the importance of outside considerations. Perrini proposes a two-level paradigm to integrate legitimacy and stakeholder theory; the first level focuses on active followers, and the second level refers to passive stakeholders. Active stakeholders are those who have a direct relationship with the company, such as business partners, clients, employees, and suppliers. To obtain and perpetuate legitimacy, enterprises must target and prioritise those immediate stakeholders who are most likely to have the greatest influence on the firm evaluation. Passive followers do not have a direct relationship with the organisation and rather react to the general moral or ethical stance presented publicly.

While stakeholder and legitimacy theories vary in several ways, they both focus on the relationship between the company and its operational environment. In general, stakeholders' interpretations of a firm's sustainability motivations might be extrinsic (to obey environmental regulation) or intrinsic (to align strategy with the firm's vision, Aguinis & Glavas, 2012; Du et al., 2010). In both cases, the purpose can be viewed as an endeavour to boost a company's bottom line. On a related note, profit seeking and self-interest are not inherently immoral, but profit maximisation without a moral foundation leads to major flaws. To reinforce the argument of Porter and Kramer (2011), not all profit is created equal. Earnings with a social purpose are a greater type of capitalism that will help society progress more quickly while enabling businesses to expand even further. Secondly, stakeholders may believe that there is an underlying motivation when a company behaves with real care for society and the environment. Stronger intrinsic motive attributions may allow stakeholders to draw favourable conclusions about a firms' core personality.

Interestingly, a number of recent studies suggest that stakeholders are capable of identifying and resolving various sustainability motivations. For example, discretionary CSR efforts often result in enhanced relationships with internal and

external stakeholders (Camilleri et al., 2017). According to Forehand and Grier (2003), corporations may reduce stakeholder scepticism, improve the credibility of their sustainability message, and increase goodwill by addressing both intrinsic and extrinsic incentives in sustainability communication. Stakeholders, in the end, do not react negatively to extrinsic sustainability objectives per se, but rather to any advertising technique that appears to be dishonest or misleading (Forehand & Grier, 2003).

Substantive versus symbolic actions

Even though stakeholder theory provides a solid foundation for the majority of the legitimacy research, it does not completely explain the motivation behind the sustainability communication of organisations (Bitektine, 2011; Scherer et al., 2013). In fact, while several studies show that a company's environmental actions have a favourable influence on its economic performance, the correlation and underlying antecedents remain ambiguous (Aguinis & Glavas, 2012). Only a limited number of previous studies addressed the environmental component of the triple bottom line to understand the impacts of symbolic ('talk') and substantive ('walk') initiatives (Walker & Wan, 2012; Westphal & Zajac, 1993).

According to Ashforth and Gibbs (1990) and Suchman (1995), organisations have a wide range of communicative techniques and actions to indicate their social and environmental commitment, and stakeholder engagement techniques are becoming essential vehicles for credibility enhancement (White et al., 2010). Yet, the pressure to meet stakeholder expectations has incited some organisations to provide symbolic rather than substantial corporate sustainability strategies to gain legitimacy for their activities.

The concept of symbolic versus substantial environmental communication builds the neo-institutional economic theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Pfeffer, 1981). Symbolic legitimising approaches strategically highlight

conformity to ethical or societal standards without achieving actual results. In other words, companies adopt prominent public initiatives that are congruent with societal expectations while making no changes to their core operations (Meyer & Rowan, 1977). Despite studies showing that symbolic actions have resulted in negative appraisals (Walker & Wan, 2012; Westphal & Zajac, 1993), this strategy can have some strategic advantages, for instance, reducing the financial expenditure compared to actual operational changes (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Some studies have shown that ceremonial conformance can help corporations gain credibility (Oliver, 1991) and others suggest that symbolic gestures are particularly effective amongst low-proximity stakeholders (Rao, 1994; Schons & Steinmeier, 2016). Consequently, the ability to detect substantial measures is linked to stakeholder proximity.

Specifically, low-proximity stakeholders may struggle to determine whether claims regarding a company's environmental activities are used as strategic rhetoric or based on genuine actions. External stakeholders, such as clients or local communities, may find it challenging to distinguish between the two types of sustainability claims. Most external stakeholders lack insights into internal operations and actual firm performance, which are often opaque to an outsider. This lowers the ability to distinguish between the symbolic or substantive nature of a company's environmental efforts. For instance, if a company participates in environmental programmes by devoting part of its time or financial resources to a local project without publicising this engagement, external stakeholders may be unaware of these efforts. If the goal is to increase corporate legitimacy outside the company, the costs of such endeavours may outweigh the benefits. Schons and Steinmeier (2016) confirmed this notion by showing that the costs of establishing meaningful corporate citizenship prevailed over the conformity appraisal.

Substantive legitimising techniques aim to put sustainable social and environmental practices in place that result in actual and measurable improvements in environmental performance. Substantive activities are considered genuine, include changes at an operational level, and demand significant time and resources investment (Weaver et al., 1999; Zott & Huy, 2007). Substantial environmental initiatives may increase a company's productivity or lower its legal risk (McGuire et al., 1988; Orlitzky et al., 2003; Russo & Fouts, 1997) but may also result in higher expenses (Oliver, 1991).

Beyond financial considerations, organisations should consider other perspectives to the debate on symbolic versus substantive corporate sustainability. Internal stakeholders are more likely to recognise symbolic acts since they are part of the company and have better insights into the firm's activities. As a result, internal stakeholders are less likely to fall for ceremonial conformity. Vice versa, internal stakeholders can detect a company's genuine environmental efforts. Consequently, high-proximity stakeholders understand and encourage a company's sincere measures. Furthermore, even if substantive activities lead to higher expenses, the enhanced productivity is potentially greater than the negative financial-performance impact of the expenses.

Whether a corporate policy can be considered substantial or symbolic is ultimately a matter of interpretation. If sustainability communication is primarily directed towards internal stakeholders, organisations are advised to employ sincere and measurable policies as employees and investors are likely to detect ceremonial actions. However, when aiming to create a favourable image outside of the company, symbolic actions may suffice. Since evaluations of external stakeholders are usually based on public information, the lack of performance data may be a cheaper and more effortless alternative, ethical and societal compliance notwithstanding. Given the time and money needed to implement environmental transformations, most sustainable

practices are likely to be a combination of symbolic and substantive management techniques (Christmann & Taylor, 2006). Apart from these hypotheses and fragmental research, there is relatively little empirical study on the use of substantive and symbolic legitimising management methods, particularly within the context of Ashforth and Gibbs' (1990) dichotomy in sustainable social and environmental practices.

Greenwashing

Whether sustainable initiatives serve a substantive or symbolic purpose, they can be considered candid attempts to advocate for environmental efforts. While some companies have made these genuine efforts to minimise their ecological impact, others deliberately mislead their stakeholders (Garfield, 1991). Companies facing increased public scrutiny on environmental issues, for instance, petrol companies that are some of the main contributors of carbon emissions, have especially been found to purposefully use illegitimate ways to improve their environmental appearance (Cherry & Sneirson, 2012; Furlow, 2010). This practice is referred to as 'greenwashing'.

Greenwashing is a selective disclosure of positive information about a company's environmental performance while hiding negative environmental information (Delmas & Burbano, 2011; Lyon & Montgomery, 2015). It is a deliberate misrepresentation of a company's environmental activities and outcomes in order to restore or develop a positive public image (Marquis et al., 2016). Greenwashing stems from a company's need for legitimacy, from the assumption that its acts are desirable, legitimate, and acceptable within a socially built system of norms, values, and beliefs (Suchman, 1995). Firms attempting to earn or retain legitimacy have a larger motivation to adopt communication tactics to possibly affect stakeholders' perceptions (Kostova & Zaheer, 1999). The perception of a company's social and environmental responsibility has been found to affect shareholder relations, employer branding, and media appraisals (Alniacik et al., 2011).

In general, the goal of using misleading sustainability communications is to satisfy stakeholder expectations by ignoring appropriate communication norms, knowing that the expressed information is not entirely accurate, ambiguous, or only half-true (Lyon & Montgomery, 2015). As shown above, especially external stakeholders often have difficulties determining the authenticity of environmental claims. Since credibility is based on a subjective evaluation process (Metzger et al., 2010), organisations engage in greenwashing because it is a comparably effortless way of increasing reputation, even with the risk of compromising their legitimacy.

Another reason for the increased use of greenwashing further builds on the notion that the same message can be perceived as apposite and honest by one recipient but deceptive by another. Understanding stakeholder perception therefore plays a critical part in the process. Given the unethical nature of this strategy, several studies have investigated how and why corporations' environmental actions influence stakeholder perceptions of corporate greenwashing. Building on de Vries and colleagues (2015), individuals often see corporate sustainability messages as 'rhetorical hot air' rather than real. They point out that the way investments and commitments to environmental preservation and sustainability are conveyed significantly impacts public perceptions of corporate greenwashing. This practice raises scepticism of such statements (Du et al., 2010). Additionally, clear environmental disclosures have successfully compensated for public perception of the negative consequences of liability exposures in specific instances (Deegan, 2002). Overall, there has been little study on greenwashing (Aji & Sutikno, 2015; Berrone et al., 2017; Nyilasy et al., 2014). More research is required since greenwashing has the potential to impact not just positive impressions (Darke & Ritchie, 2007) and company performance (Du, 2015) but also ethical harm (Nyilasy et al., 2014).

As mentioned before, there are several theoretical concepts that can be used for analysing greenwashing, among others cognitive dissonance theory, ELM, and

signalling theory. While all three concepts have been used in the literature to explain the effectiveness of deceptive marketing, such as greenwashing, this dissertation builds on signalling theory. Rooted in consumer behaviour, the theory is particularly suitable for studying deceptive marketing practices such as greenwashing as it builds on the concept of information asymmetry (Seele & Gatti, 2017). One notable reason is its emphasis on the role of signals in differentiating products in competitive markets (Berrone et al., 2017). As the market for environmentally friendly products becomes more saturated, companies resort to greenwashing to gain a competitive edge by creating the illusion of superior environmental performance. Signalling theory provides a framework to understand how companies employ various signals, such as eco-labels and certifications, to set themselves apart from competitors and attract environmentally conscious consumers. In an environment characterised by information asymmetry, the credibility of signals plays a significant role in influencing consumers' decision-making (Connelly et al., 2011).

Furthermore, signalling theory allows focusing on the cost of signals contributes, which is particularly relevant for greenwashing, given that most organisations engage in greenwashing as a cost-effective way to promote environmental advocacy. The cost of sending a signal can help to separate high-quality from low-quality senders (Spence, 1978). In the context of greenwashing, companies may resort to low-cost, misleading signals to deceive consumers. Examining the cost of signals in greenwashing can help researchers identify the strategies companies employ to minimise their investments while maximising the perceived environmental benefits. This can provide valuable insights into how to develop more effective policies and regulations to curb greenwashing.

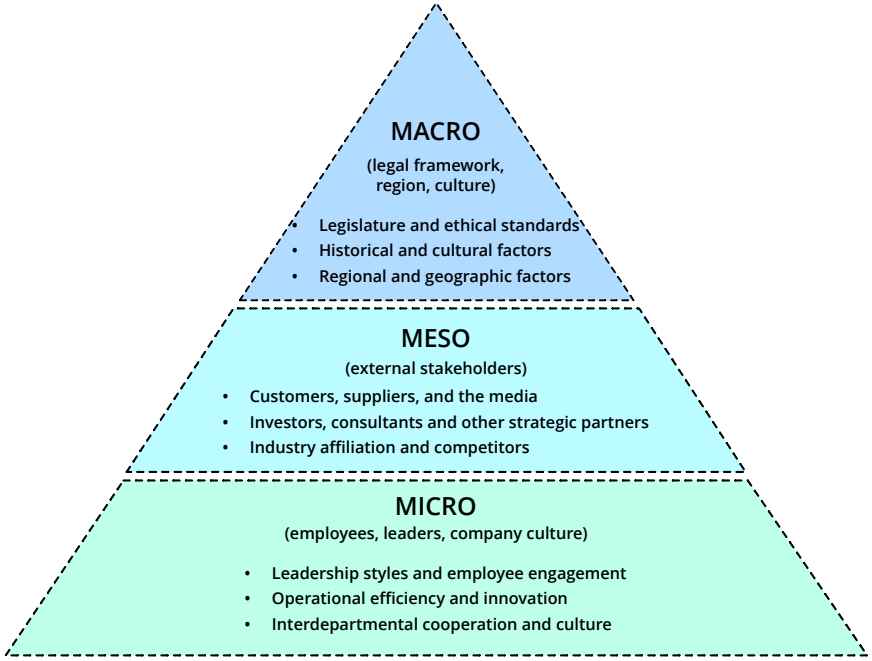

Figure 2.3: Hierarchical model of stakeholder interaction.

2.3 Towards a new framework of sustainability communication

With its focus on environmental advocacy in organisations, this thesis aims to address the topic of climate change communication in a holistic way. Organisations are members of a complex cosmos of interacting parties. It is imperative to consider how organisations interact with various groups of stakeholders to understand corporate communication (Brennan & Merkl-Davies, 2018; Johansen & Nielsen, 2011; Welch & Jackson, 2007). To achieve this in a systematic manner, this section considers sustainability communication on three different levels: Internal perspective (micro level), external perspective (meso level), socio-cultural perspective (macro level). The remainder of this section and the subsequent chapters build on the hierarchical framework that considers these three levels of stakeholder interactions (see Figure 2.3).

(1) The micro level

The first level focuses on intraorganisational interactions. Prior research has consistently shown that organisational leaders act as a catalyst for environmental progress and innovation (Tang et al., 2018). Senior management teams thus play a critical role in guiding an organisation and workforce towards increased environmental awareness (Walker et al., 2015). One focus of this dissertation is the study of effective leadership practices and their impact on employee motivation and pro-environmental behaviour within organisations.

Through the lens of sustainability communication, the internal drivers of leadership, operational efficiency, interdepartmental cooperation, culture, and enablers of innovation are determined (Marcon et al., 2017). The focus on micro-level research is aimed at helping leaders to improve engagement, mobilise resources more effectively, find support for new ideas and business models, and encourage teamwork.

(2) The meso level

While previous research has widely examined the opportunities and conflicts that come with internal strategic transformations (e.g., Alberti & Garrido, 2017; Gružauskas et al., 2018; Hahn et al., 2014; Moeller et al., 2011), the focus has only recently shifted towards external factors surrounding organisations (Beckmann et al., 2014; Van der Byl & Slawinski, 2015). As a result, there has been far more research at the micro level, determining the origins and repercussions of individual behaviour and attitudes, than research at the meso and macro levels.

Advocates of internal corporate sustainability research argue that micro-level considerations serve as the foundation for outside actions as environmental performance increases reputation and spills over to other core business sectors such as innovation, economic integration, and corporate reputation (see, e.g., Inoue et al.,

2011; Kao et al., 2018; Tang et al., 2012). However, focusing solely on individual characteristics and behaviours at the cost of the meso level can limit the implications of effective communication. Internal considerations often overlook the many ways in which social and communal circumstances affect employee engagement, the relational mechanisms that constitute organisational operations, and how those circumstances differ amongst various groups. Results show that the strongest and most resilient constituencies originate from communal environments that consider people's interests, abilities, connections, and commitments to one another (Han, 2014). Furthermore, internal considerations neglect how to grow engagement with increasingly diverse groups of stakeholders. Lastly, it restricts our knowledge of how to create actions targeted to stakeholder demands, emphasises selection over socialisation, and risks designing sustainability campaigns misconceived by their target audience.

According to Lozano's (2015) sustainability driver model, the dynamic interaction of external stakeholders, including consumers, investors, suppliers, legislators, consultants, and other strategic partners, as well as the industrial landscape in which a company operates, provide significant value in the form of cooperation and co-creation of sustainability solutions (Marcon et al., 2017; Neutzling et al., 2018).

(3) The macro level

As both private and public actors engage in and rely on social capital, corporate sustainability commonly draws from spillover effects (Nilsson et al., 2017) and the establishment of industry networks (Habisch & Moon, 2006). Therefore, participation in regional activities and the strategic decisions to settle in a certain geographical area depend on the innovation potential and legislative structure of a region. Additionally, corporate sustainability entails adhering to legal and ethical standards (Carroll et al., 1991). Legal responsibilities represent a form of standardised ethics in the sense that they embody basic notions of fair operations as established by

lawmakers. Companies are expected to operate within the legal framework defined and ruled by legislators (Carroll et al., 1991). Disobedience can drastically impact corporate legitimacy. As partial fulfilment of the social contract between business and society, ethical duties encompass those actions and behaviours that are acknowledged or condemned by members of society (Deegan, 2006). Moral duties are defined as those rules, conventions, or obligations that demonstrate consideration of what the society considers ethical and consistent with regard to or preservation of moral rights. To develop a well-founded communicative framework, it is essential to consider the macro-economic and socio-cultural factors that constitute environmental advocacy in a given legislative and societal context.

In summary, to champion sustainable transformations depends on a holistic understanding and integration of factors from within and outside of an organisation (Ha, 2014; Morrison, 2003). Environmental awareness and attitudes, employee participation, and leadership styles as 'internal factors', participation in industry networks and a keen sense of stakeholder expectations as 'external factors', and contextual elements of public policy and market forces as 'socio-cultural factors' jointly determine the effectiveness of corporate sustainability transformations (Taticchi & Demartini, 2020; Van den Berg et al., 2019). It is concluded that in isolation, micro, meso, and macro approaches are unlikely to induce long-term environmental advocacy. Instead, this dissertation develops a new way to conceptualise and envision communicating climate change. It is argued that future interventions and policy levers are more likely to reduce the gap between public communication and behavioural change when policymakers and sustainability managers understand (1) how environmental messages are perceived, (2) how leaders can obtain and maintain legitimacy in their communication practices, and (3) what factors eventually stimulate measurable, rather than theoretical, environmental advocacy.

As a final note, while these levels are schematically separated to provide a clear theoretical perspective, in practice, it is more likely that there is a reciprocal and integrated relationship between the internal and external factors.

2.3.1 Leadership and top-down communication

The theories presented in this chapter thus far have predominantly considered organisational legitimacy as a holistic concept that is reflected by a firm's image or credibility. To gain a comprehensive picture of corporate legitimacy, it is important to start with understanding individual behaviour, not least because firms consist of individual employees. Individual actors, whether those are employees, organisational leaders, or policymakers, are critical in achieving effective and sustainable environmental advocacy. In addition, to create legitimate environmental advocacy facing the outside world, reaching consensus within an organisation is key to formulating a joint strategy and increasing intrinsic motivation amongst the workforce. To transition from conformity to a deliberate and intrinsic motivation for corporate sustainability, an organisation must go through a transformational process that covers strategy, values, and competencies (Bratton et al., 2021). Research has frequently shown that organisational management and top-leadership teams are critical in facilitating this transition. Thus, the following subsection provides a brief overview of theories of power and environmental leadership and outlines the emerging gaps in the literature.

In reviewing the literature, a range of theories offers valuable insights into the study of power. One example is the social exchange theory. The theory posits that power arises from the dependence of one person on another for valuable resources or outcomes and thus focuses on the principle of reciprocity and cost-benefit analysis in social interactions (Cook et al., 2013). This theory's strength lies in its emphasis on the interdependence of individuals within social relationships. However, given that power will be examined in China, the theory may not be suitable to fully capture

the influence of cultural values and norms, such as the importance of hierarchy and respect for authority, which play a significant role in shaping power relationships within Chinese society (Duan et al., 2022; Fan et al., 2021).

A second consideration is social identity theory ((Hogg, 2016)), which explains how power is related to group membership, offers insights into how individuals identify with particular groups and access the power and prestige associated with them. The strength of this theory lies in its ability to explain the role of group dynamics and identity in shaping power relationships. In the context of a collectivist country like China, this focus could be beneficial. However, the theory tends to focus on individual-level factors that shape identity and behavior, rather than contextual factors that influence communication processes. In China, top-down communication occurs within a complex cultural, historical, and political context, which can significantly impact how power is exercised and perceived. Social identity theory may not fully account for these contextual factors. Moreover, social identity theory primarily focuses on intergroup dynamics, rather than the intragroup power dynamics that might be more relevant for examining top-down communication within organisations.

With neither social identity nor social exchange theory being particularly suitable for studying power in China, a theory that provides sufficient nuances for complex socio-economic contexts is needed. One such theories is French and Raven's (1959) bases of power theory. The theory is may be more relevant for studying power dynamics in China as it recognises various sources of power that can emerge within social settings (Podsakoff & Schriescheim, 1985). This theory's strength therefore lies in its ability to capture the nuances of power dynamics, including legitimate power, reward power, coercive power, expert power, and referent power. In China, power often relies on relationships and networks rather than formal positions or resources. A theory that highlights the different sources and nuances of power provides may be particularly suitable in this cultural context.

Effective sustainability leadership has many facets, and scholars have collected an exhaustive list of strategies. Going through the literature, two of the most consistent leadership principles are cross-departmental engagement and a clear definition of values and mission statements.

Firstly, strategic sustainability is a method of conceptualising and approaching relationships that influences an entire workforce (Grewatsch & Kleindienst, 2017). As information is scattered across departments and is not limited to a single individual or group, integration at different organisational levels is critical. The sustainability team plays an important role in provoking reform, analysing patterns and difficulties, and organising stakeholder engagement (Lahtinen & Yrjölä, 2019). Several studies discovered that monitoring, integrated governance, and coherent leadership styles across the entire corporate hierarchy are critical for long-term success (Morrison, 2003; United Nations Environment Programme Finance Initiative, 2014). CEOs and the board of directors must approach sustainability as a strategic issue (Bhattacharya, 2017). Junior employees and mid-level managers must be integrated across several departments (Bacon et al., 2011) and cross-functional teams (Harms, 2011) and should take equal responsibility for sustainability outcomes. To that end, a sustainability policy must clearly define duties and responsibilities, as well as strategic, technical, and administrative activities (Lahtinen & Yrjölä, 2019) and clear procedures for assessing, evaluating, and presenting achievements (Sardá & Pogutz, 2018).

Secondly, according to recent research, putting in place a coherent vision prior to executing the strategy is equally critical in achieving long-term success (Galpin & Whittington, 2012). As thought leaders and idealistic representations of the organisation, the corporate management is a crucial strategical component in influencing employees and assuring long-term success (May & Stahl, 2017). Pairing strategic (vision) with tactical (enabling environment) and functional (day-to-day practice) action is seen to be particularly effective for emotional or societal issues such

as sustainability or climate change (Taticchi & Demartini, 2020). Effective decision and change strategies vary as a function of task ambiguity and goal consensus.

In summarising the two aspects of sustainability transformation (i.e., interdepartmental engagement and clear value statement), it can be concluded that both methods follow a top-down approach. The top-leadership team first presents a moral compass and code of conduct. Visions and ideals are then distributed across departments and along the corporate ladder. Taking this argument even further, it can be assumed that environmental stimuli are more effective when being communicated by high-ranking individuals. Surprisingly, the current literature does not provide a sufficient answer to this assumption. One line of arguments proposes that power promotes change since powerful individuals are entrusted with greater authority and status (Anderson & Berdahl, 2002), having better communication platforms (Galinsky et al., 2003), and being associated with higher levels of expertise and experience (Leithwood & Steinbach, 1995). As a result, environmental advocacy is easier to be elicited when being addressed in a top-down communication process. Others argue that pro-environmental attitudes and actions are primarily shaped by close social networks, such as family, friends, colleagues, and other peers (e.g., Robertson & Barling, 2013). Given that environmental actions are highly value based, the proximity between the communicator and the recipient becomes an important factor in raising awareness and encouraging change. Following this proposition, it is equally likely that peers are more effective in stimulating environmental behaviour given their ability to evoke social and personal norms (Collado et al., 2019).

The first empirical study in this thesis is motivated by the desire to make sense of the conundrum outlined above. The emerging research question builds on the concept of power and top-down communication and aims to answer the following question:

RQ 1: *Who is more effective in stimulating pro-environmental behaviour: Top-level leaders or same-level peers?*

2.3.2 Chief sustainability officers: Ceremonial conformity or legitimate hires?

Investigating the benefits of top-down communication at the micro level (i.e., within organisations) provides valuable theoretical and practical implications for sustainability communications. In a global economy, organisations frequently interact with each other. The way that information about climate change is framed and communicated can significantly influence the public's knowledge, attitude, and perception towards the issue (e.g., Sampei & Aoyagi-Usui, 2009; Sharples, 2010; Van der Linden, 2014; Weingart et al., 2000). Consequently, it is equally important to enhance public perception of corporate sustainability. Analysing leadership in the context of public communication strategies is critical.

The second study in this dissertation focuses on the disparity between consonance with the moral rules of society and actual environmental engagement in public communication. It will be explored how the credibility of a leader can enhance or damage the legitimacy of an organisation. Theoretically, the credibility of an organisation depends not only on legal conformity but also the way that legal and voluntary moral norms are communicated (Gunningham et al., 2004).

One potential way to implement environmental governance, and thereby cope with environmental pressures, is to appoint a CSO to the C-suite. If executed in the right way, a designated sustainability advocate in the top management can bring substantial expertise to the board while also signalling environmental conscience and awareness as an organisation. Yet, despite the theoretical advantages, previous research has found contradicting results on actual performance outcomes of such hiring

decisions (e.g., Kanashiro & Rivera, 2019). This ambiguity raises the question of whether CSOs create actual environmental change or merely serve a symbolic purpose.

Based on the concept of ceremonial conformity (Boiral, 2007; Springett, 2003), organisations create new executive structures to adopt prominent public initiatives that are in line with societal expectations and thereby attain corporate legitimacy (Seele & Gatti, 2017; Walker & Wan, 2012), without making real changes to their core operations (Meyer & Rowan, 1977). In fact, simply giving the impression of being socially responsible can be easier, cheaper, and more flexible for companies, and at least at first may bring the same benefits as true commitment (Walker & Wan, 2012).

The ambiguity between theoretical benefits of hiring a CSO and actual environmental performance data has increased stakeholder scepticism (Wiengarten et al., 2017). This raises the question of whether organisations are ill-advised in appointing a dedicated sustainability advocate to the C-suite or whether previous studies have potentially missed the actual impact of CSOs. Accordingly, the second key question of this doctoral dissertation is as follows:

RQ 2: *Are top-level sustainability officers legitimate hires or do they represent ceremonial conformity?*

2.3.3 (Il-)legitimate marketing: The case of greenwashing

Whether CSO appointments serve a genuine purpose or represent ceremonial conformity, they can be considered implicit forms of communication. Implicit, in this sense, refers to strategies that *imply* a certain conformity to societal or ethical standards (Mangun & Thurston, 2002). Raising environmental concerns and expectations to engage in ecologically responsible behaviour have increased the desire to take an active role in shaping consumer or stakeholder impressions (King & Lenox, 2002). Consequently, many businesses attempt to improve their environmental standing by

actively or explicitly advertising their environmental activities to the community. Companies have used green marketing methods to advance their strategic advantage and appeal to environmentally sensitive consumers to convey their green initiatives. Yet green marketing may not always adequately represent a company's real environmental identity. The third study attends to the concept of deceptive marketing under the umbrella of greenwashing.

While greenwashing is a long-standing construct in consumer behaviour, it only recently gained traction in other research areas. Thus, the degree to which greenwashing affects other business areas often remains understudied. Rather than exploring the conventional avenue of consumer research, the third empirical study in this thesis shifts the attention towards employer branding.

In the constant and increasing war for talent (Michaels et al., 2001), organisations are striving to present themselves as desirable employers, and several studies found that an organisation's green reputation is critical for attracting job seekers (see, e.g., Bin Magbool et al., 2016; Botha et al., 2011; Montgomery & Ramus, 2003). Younger job seekers especially value a healthy work-life balance and a meaningful contribution to society of both their work and their organisation as a whole (Thompson & Gregory, 2012). Studying whether and to what extent sustainability helps attract and retain personnel becomes a central question of today's HR discourse (Bin Magbool et al., 2016). Critically, companies may be enticed to leverage green marketing strategies to attract talent and potentially present themselves as green employers despite low environmental performance.

Job choices represent a distinct type of decisions that are different from day-to-day consumer choices as they often involve multiple steps, cannot be bought, and generally have far-reaching consequences. Therefore, it is of great interest to shed light on the interacting effects of marketing and perceived brand image or identity on

job intentions. In fact, there is a present call for more research to identify and catalogue the varieties of green employer branding and measure its impacts on organisational perceptions and recruiting success (Lyon & Montgomery, 2015). In addition, studies on greenwashing in countries with low environmental performance remain scarce (Wang et al., 2020). Alonso-Almeida and Llach (2019) hypothesised that the economic prosperity of participants' home countries might influence their sustainability appraisals. Thus, individuals in countries with low environmental performance potentially place less emphasis on the credibility of sustainability claims. At the same time, their findings also reveal that graduates from collectivist cultures are more drawn to responsible organisations than those with individualistic backgrounds (Alonso-Almeida & Llach, 2019). A study combining deceptive green marketing and talent attraction, especially in a collectivist culture, poses a promising research domain.

Accordingly, the third research question of this doctoral dissertation examines the interaction between recruiting, green identity, and marketing on employer perception and job-pursuit intentions in China. Specifically, this chapter addresses the following question:

RQ 3: *Who can attract more talent: Genuine green companies or disingenuous companies pretending to be green?*

2.3.4 The role of rural policies in attracting green entrepreneurs

One fundamental component of legitimacy theory is attraction. Similar to organisations aiming to attract job seekers with their environmental identity, legislators and policymakers are equally concerned with attracting organisations to settle in their region. Compared to organisations, however, governmental bodies have other tools or levers at their disposal. The previous sections highlighted the importance of intraorganisational communication (micro level) and interactions between different

external stakeholders (meso level). To get a well-rounded picture of sustainability communication, the final study takes a macro-policy perspective.

While companies and individual citizens are responsible for the majority of carbon emissions, they are also part of the larger economy or society, embedded in a legislative framework, and regulated by policymakers and governmental bodies. Understanding how these individual actors make their decisions can help legislators to design effective policies that can stimulate environmental innovation and economic wealth. To narrow down the research area, the final study focuses on how policymakers can attract sustainable or green entrepreneurs to settle in their region.

This focus has several objectives. Beyond its economic impact, entrepreneurship is particularly important in the battle against climate change (Audretsch, 2007; Eyraud et al., 2013). Sustainable start-ups invent methods and technologies for delaying or reversing negative impacts (Nemet, 2009) and frequently disrupt traditional markets, such as the energy sector (Andoni et al., 2019). The view that businesses need to become more sustainable is now accepted amongst policymakers, management scholars, and entrepreneurs alike (Markman et al., 2019). However, despite its growth over the past years, research on the green-tech sector is still nascent and volatile (Meyskens & Carsrud, 2013). While it has become increasingly recognised that entrepreneurs can play a central role in the transition to a more sustainable society, how such a transition might be realised is still a topic of ongoing debate (Markman et al., 2019; Schaefer et al., 2015). Previous research also often ignored the presence of cultural regimes and their opportunities and threats of sustainable development (Barkemeyer et al., 2014). As different regions offer different environmental, social, and legislative factors for start-ups, policy perspectives on legitimacy should stress the regional conditions and legislature (Mena & Palazzo, 2012; Scherer et al., 2013). Consequently, more research is needed on sustainable entrepreneurship in specific areas, focusing on the specific impact and return of spending of regulatory institutions. This can provide insight

into the circumstances required for the growth of sustainable businesses on a larger scale. Additionally, this can bring novel perspectives on the interplay of policies and entrepreneurial performance and survival.

It is crucial to examine cross-cultural migration patterns using actual data to address this gap. Unfortunately, most studies on this subject either focus on a singular economy (such as Italy, in the case of Giudici et al. 2019) or use theoretical or hypothetical scenario-based studies (e.g., Audretsch & Belitski, 2021; Fuller-Love et al., 2006; Sinatti, 2019). As a result, Giudici et al. (2019) propose that scholars should "compare and contrast the creation of cleantech start-ups in the diverse European countries" (p. 13). Accordingly, the final research question of this dissertation follows:

RQ 4: *How can rural policymakers attract sustainable entrepreneurs and foster green innovation?*

2.4 Research questions and next steps

This chapter has reviewed the origins and forms of corporate sustainability communication across individual, organisational, and socio-cultural levels. Focusing on three levels of legitimacy in different contexts provides a holistic picture of the opportunities and limitations of corporate sustainability strategies. Throughout this review, various gaps in the literature have been identified. This thesis intends to empirically demonstrate the validity of an interdisciplinary approach to sustainability research and serve as a motivation for future investigations. To achieve this goal, the following studies aim to design and test a new framework for communicating genuine environmental advocacy that builds on this central research question:

How can organisations achieve legitimate environmental advocacy through corporate sustainability communications?

In summary, four empirical papers answer this question by examining legitimacy theory within and outside of organisations:

Paper 1: *Who is more effective in stimulating pro-environmental behaviour: Top-level leaders or same-level peers?* **Paper 2:** *Are top-level sustainability officers legitimate hires or do they represent ceremonial conformity?* **Paper 3:** *Who can attract more talent: Genuine green companies or disingenuous companies pretending to be green?* **Paper 4:** *How can rural policymakers attract sustainable entrepreneurs and foster green innovation?*

3 | Power and environmental behaviour

3.1 Overview

Environmental issues are often addressed by powerful individuals (such as politicians, academics, experts, or organisational leaders) in a top-down communication process. To promote sustainable behaviour, those in high-power positions frequently use emotional narratives – communication tactics that attempt to enforce pro-environmental change (Brader, 2005; Casasanto & Jasmin, 2010; Kramer, 1963; Riggio & Reichard, 2008; Schröder, 2001; Vlasenko et al., 2007); for example, politicians and CEOs inducing pride over achieving of CO_2 goals (Andersson, 2016; McCann, 2013) or NGO leaders pressurising guilt upon neglecting climate change (Harth et al., 2013). But is power really an effective tool to evoke environmental emotions and can it encourage pro-environmental behaviour?

This study provides insights into how to increase pro-environmental behaviour through top-down communication. There is a prevalent belief that power promotes change since powerful individuals are being entrusted with greater authority and status (Anderson & Berdahl, 2002), having better communication platforms (Galinsky et al.,

2003), and being associated with higher levels of expertise and experience (Leithwood & Steinbach, 1995). The focus on top-down communication is further informed by the fact that individuals in powerful roles can have a significant positive effect on raising moral awareness (Kalshoven et al., 2013), changing attitudes, and stimulating pro-social actions (Anderson & Berdahl, 2002; French et al., 1959; Goldhamer & Shils, 1939; Hecht & LaFrance, 1998; Keltner et al., 2003). Examining perceived power in the field thus offers policymakers direct insights to derive strategies for the effective design of environmental campaigns. Moreover, measuring participants' environmental identities as an additional predictor to control for those individuals who have a lower general tendency to act pro-environmentally (Van Horen et al., 2018). This allows examining whether identity has a different effect on guilt and pride and whether the cultivation of power is a potential mechanism to enhance emotions and encourage pro-environmental behaviour. Accordingly, the moderating effect of power on the relationship of identity, environmental emotions and pro-environmental behaviour is investigated. It is expected that environmental top-down communication can be an effective tool to positively affect climate change and prevent further environmental degradation.

3.2 Literature review

3.2.1 Power and top-down climate communication

There is an assumption that individuals in a position of power are more effective in transferring emotions to their peers than their low-power counterparts (Damen et al., 2008; Hatfield et al., 1992). This hypothesis is grounded in the psychological concept of 'emotional contagion', which refers to the intrinsic and innate process whereby people align and mimic other people's facial expressions, vocalisations, and motions (Hatfield et al., 1994). Previous research in both lab and field environments

shows that there is emotional contagion from superiors to subordinates (see, e.g., Bono & Ilies, 2006; Johnson, 2008; Sy et al., 2005). For instance, when powerful leaders are evoking a positive emotional appeal (such as pride about achievements), receivers are likely to respond to the message with enthusiasm and affirmation (Benford & Hunt, 1992).

While there is some evidence indicating that the power of a person can dictate the specific emotions individuals spontaneously and strategically experience and express, the processes by which power shapes environmental emotions have not been thoroughly articulated yet (also see, Tiedens et al., 2000, on the relationship between power and emotion-related appraisals). Most research in environmental contexts induced emotions via articles and essay writing (Ferguson & Branscombe, 2010; Harth et al., 2013; Mallett, 2012; Mallett et al., 2013; Rees et al., 2015), internal reflection through memory tasks (Schneider et al., 2017), and daily experiences of moral emotions (Bissing-Olson et al., 2016). However, in light of appraisal theory (Roseman & Smith, 2001), feelings are not only generated through self-appraisals but also formed by assessing the behaviour of others (Baumeister et al., 1994). Building on this, the present study considers powerful individuals' ability to form personal norms and emotional appraisals by communicating environmental advocacy (Tangney et al., 2007a).

In the context of studying top-down communication in organisations within China, French and Raven's bases of power (1959) and resource dependency theory (Pfeffer & Salancik, 2003) are likely to be the most suitable theories to apply. Both of these theories focus on the sources of power and how they can influence behaviour in organisational settings, making them particularly relevant for examining top-down communication.

The bases of power theory (French et al., 1959) is well-suited for studying Chinese organisations, as it recognises various sources of power that can emerge within an organisation, such as legitimate power, reward power, coercive power, expert power, and referent power. These bases of power can help researchers understand how top-level leaders in Chinese organisations exercise their authority and how it affects the behaviour of subordinates.

Furthermore, Chinese culture, with its emphasis on hierarchy and respect for authority derived from Confucianism, aligns well with the concepts of legitimate and expert power. Top-level leaders in Chinese organisations often possess legitimate power due to their positions and roles, and employees are expected to respect and comply with their directives. Additionally, leaders with expert power, acquired through knowledge and experience, are highly respected and influential in Chinese society.

3.2.2 Environmental guilt and pride

Unlike prior research on emotions and environmental behaviour (Chen, 2016; Corral-Verdugo et al., 2011; Meijnders et al., 2001; Reese & Jacob, 2015), which usually explores single emotions, this study focuses on the impacts of two domains of emotional communication: A negative and a positive. Specifically, this research tests guilt and pride, which are considered essential feelings to study in relation to pro-environmental behaviour (Tangney et al., 2007b). Baumeister, Stillwell, and Heatherton (1994, 1995) have argued that guilt is an essentially social phenomenon, arising especially from interpersonal transactions. This suggests that guilt is strongest in the context of social relationships (Vangelisti et al., 1991; Vangelisti & Sprague, 1998). Accordingly, the influencing agent arouses guilt, which then motivates the performance of the desired action. This study looks explicitly at environmental guilt resulting from a leader's appraisal in a top-down approach.

While studies on guilt and power remain relatively scarce, several lines of research suggest an intuitive association between perceptions of pride and power (see, e.g., Tiedens et al., 2000; Tracy et al., 2010). Studies have found that high-power individuals are intuitively perceived as displaying greater levels of pride than low-power individuals (Tiedens et al., 2000). The approach–inhibition theory of power (Keltner et al., 2003) suggests that elevated power increases a person's expression and experience of positive emotions, and Tracy et al. (2013) found that pride is implicitly linked with power. Similar to guilt, it is anticipated that followers synchronise and mimic the affect and attitudes emitted by their leaders when being presented with environmental stimuli. In turn, this will lead to emotional contagion and higher engagement with environmental matters. Consequently, it is hypothesised that powerful individuals will be more likely to successfully evoke environmental guilt and pride as opposed to their low-power counterparts (H1).

3.2.3 The role of identity

Experiments within environmental psychology frequently demonstrate that the way people feel about their role towards the environment (i.e., their identity) can predict pro-environmental emotions and actions (see, e.g., Sparks et al., 1995; Whitmarsh & O'Neill, 2010). Pro-environmental identity (PEI) is sometimes grounded in theories of self-concept and relational connections and sometimes based on identity concepts (Carfora et al., 2017; Walton & Jones, 2018). As individuals with elevated environmental identity have more easily accessible moral principles within their available mental capacities (Bargh et al., 1986; Bargh & Thein, 1985; DeCelles et al., 2012), it is hypothesised that particularly when listening to powerful people, they will be more conscious of the moral consequences of a certain action compared to those with lower identity. Power would therefore activate an individual's already existing underlying traits (King et al., 2012; Overbeck & Droutman, 2013), meaning that it interacts with

the environmental identity of an individual when being presented with environmental campaigns (Reed, Aquino, et al., 2003; Reynolds & Ceranic, 2007).

Previous research supports this reasoning yet the data in this respect differs. While Charng et al. (1988) revealed such a positive interaction with peoples' intentions to donate blood (Bissing-Olson et al., 2016), Rise and Åstrøm (2001) failed to discover a significant moderation for predicting healthy eating behaviour, and Terry and colleagues (1999) did not discover a significant interaction for recycling. Apart from studies illustrating how situational variables shape the pro-environmental behaviour (see, e.g., Darley & Batson, 1973; Detert et al., 2008; Mazar et al., 2008), studies on environmental identity have yet to explain how its impact on pro-environmental behaviour is shaped by the variable 'power'. In addition, identity has been determined as an important predictor of environmentally specific moral emotions (Stets et al., 2008; Xie et al., 2015). However, little is known about the mechanisms through which power affects individuals' experience of environmental emotions.

The present research sought to fill these gaps. The participants' identities are examined as an additional predictor to control for those individuals who have a lower general tendency to act pro-environmentally. Consequently, it is expected that environmental identity and power will interact to influence environmental emotions. The relationship between identity and environmental emotions will be stronger when power is high and weaker when power is low (H2).

3.3 Method

The main purpose of this study is to reveal indications of effective climate change communication through presenters holding powerful positions. This study aims to achieve this by examining how people perceive emotional campaigns on climate change and to what extent they ultimately perform actions to achieve adequate

responses to environmental hazards and protection. Participants' pride and guilt levels about the country's environmental actions are measured in two experimental conditions (i.e., top-down and same-level communication). To control for the participants' disposition towards climate change and shed light on the promotion of environmental advocacy, this study further measured environmental identity as an additional predictor. Lastly, environmental behaviour is measured directly through donations to environmental charities. Based on the theorising above, it is hypothesised that powerful individuals are more effective than low power presenters in evoking environmental guilt and pride and addressing participants who are less inclined to act environmentally friendly. The results of top-down communication are intended to add to our understanding of emotional power in environmental contexts and help policymakers foster environmental advocacy using emotion-inducing campaigns.

3.3.1 Pre-test

A pre-test with a student sample from a Chinese university ($N = 26$) was conducted to explore whether the environmental campaign was an appropriate manipulation of emotion, whether the participants consider the content trustworthy, and whether students take responsibility for the environmental actions of the collective. Participants were randomly assigned to either a 'guilt for environmental damage' or 'pride for environmental protection' condition. Students in the guilt condition appraised their level of environmental guilt as higher ($M = 5.03$, $SD = 1.35$) than those in the pride condition ($M = 3.85$, $SD = .85$), $F(1, 25) = 7.134$, $p = .013$, $\eta^2 = .230$. The opposite effect was found when asking for their environmental pride, $F(1, 25) = 18.296$, $p < .001$, $\eta^2 = .430$. Given these results, the campaigns appeared to be appropriate manipulations of emotions arising from collective environmental actions.

3.3.2 Participants and design

A total of 254 employees (M_{age} = 29.17 years, SD_{age} = 5.91; 46.85% female) of a large, multi-national HR consultancy based in Shenzhen, China were randomly assigned to a 2 (high-power vs. low-power) × 2 (pride vs. guilt) between-subjects design. The G*Power 3 analysis (Faul et al., 2009) identified that a sample size of 251 was needed to detect a medium effect size of f = .25 with sufficient power (1-β > .80) for the main and interaction effects of an analysis of variance (ANOVA) with α = .05.

3.3.3 Procedure and materials

Participants were exposed to environmental campaigns about the damaging effects of climate change in China. They were told that the aim of the presentation was to educate them about current climate change issues and collect their opinions on how to design environmental campaigns. The condition that involved guilt aimed to evoke China's responsibility for environmental damage, whereas the condition involving pride focused on China's contribution to environmental protection. As an attention task, participants were instructed to think about climate change and China's role as described in the presentation. Thereafter, participants were asked to summarise reasons why China is responsible for [how China is contributing to fighting against] ongoing global climate change. This task lasted for about 15 minutes. Next, participants completed the measures as detailed below. After answering all items, all participants provided informed consent and were debriefed and thanked for their participation.

Power. To test for the moderation effect of power, the CEO of the organisation (high-power condition) and a total of four team leaders (low-power condition) were instructed to hold the campaigns. To make sure that the power manipulation was successful, the perceived power of the presenter was measured by using an adapted version of the *Sense of Power Scale* (Anderson & Galinsky, 2006). Participants were

asked to rate their agreement with five statements, including 'S/he can get people to listen to what s/he says' and 'I think s/he has a great deal of power' (Cronbach's α = .88).

Environmental emotions. Environmental emotions were measured using two scales. Environmental guilt (Izard et al., 1993) was operationalised with three items (e.g., 'I feel regret and am sorry about China's environmental behaviour'). The measures of guilt had reasonably high internal reliability at each time point, ranging from α = .74 to α = .91. In addition, environmental pride (Oveis et al., 2010) was operationalised with five items (e.g., 'I am proud of China's and my accomplishments').

Pro-environmental identity. Participants then indicated the extent to which they identify themselves with environmental behaviour (Whitmarsh & O'Neill, 2010). Items include, for instance, 'I think of myself as an environmentally-friendly consumer' and 'I think of myself as someone who is very concerned with environmental issues' (Cronbach's α = 0.70).

Donation task. In the donation task, participants were informed that a monetary reward (500 RMB) was given to five randomly selected participants. They were then asked how much of this money they would like to keep for themselves and how much they would be willing to donate to a charity.[1] The amount of money donated served as the dependent variable (DV). After finishing this task, participants answered demographic questions.

[1]Five participants indeed won the 500 RMB. Each of them received the amount of money they wanted to keep for themselves via WeChat, and the rest of the money was donated to a regional environmental charity.

3.4 Results

3.4.1 Manipulation check

The CEO was perceived to have significantly more power ($M = 4.71$; $SD = 0.88$) than the team leaders, ($M = 3.57$, $SD = 0.64$), $F(1, 253) = 122.808$, $p < .001$, $\eta^2 = .328$. This indicates that the manipulation of power was successful. To test the emotion manipulation, participants were asked to rate their feelings about China's environmental actions on a 7-point Likert scale ranging from 1 (very bad) to 7 (very good). Within the pride condition, participants indicated to a higher extent that they felt good about China's actions ($M = 4.52$, $SD = 1.45$) in comparison to those in the guilt condition ($M = 3.42$, $SD = 1.28$), $F(1, 245) = 41.148$, $p < .001$, $\eta^2 = .140$.

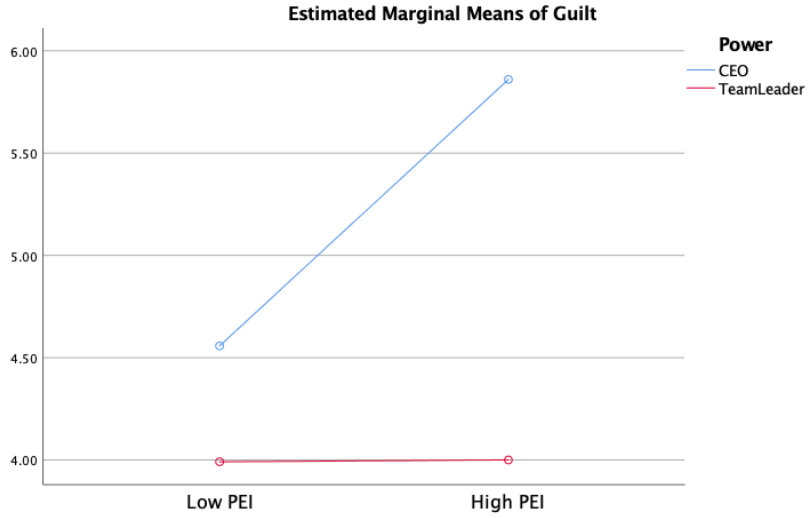

Figure 3.1: Interaction between identity and power with guilt as the DV.

3.4.2 Environmental guilt

Univariate analyses revealed the hypothesised main effect of power, $F(1, 126) = 17.985$, $p < .001$, $\eta^2 = .119$, and PEI, $F(1, 126) = 4.868$, $p = .029$, $\eta^2 = .038$, on guilt. Results further revealed a significant interaction effect between PEI and power,

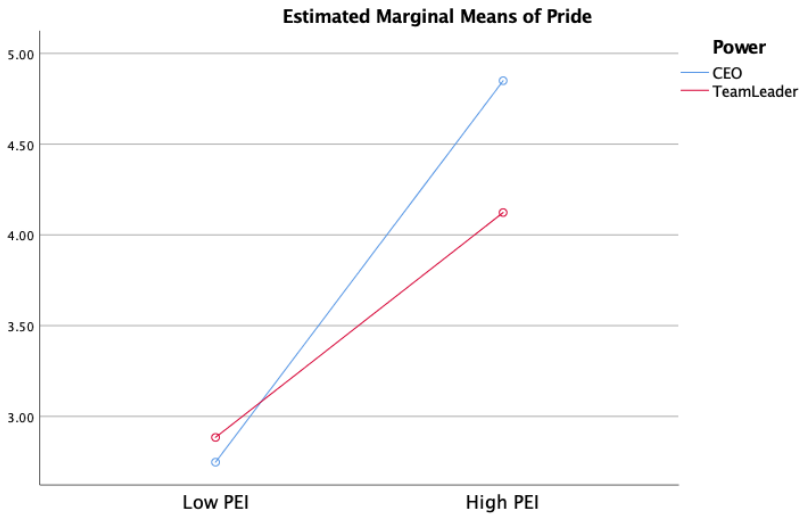

Figure 3.2: Interaction between identity and power with pride as the DV.

$F(1, 126) = 4.736$, $p = .036$, $\eta^2 = .037$, on guilt. In addition, the campaign condition also resulted in a significant main effect on guilt $F(1, 253) = 25.303$, $p < .001$, $\eta^2 = .500$, and, more importantly, it further moderated the relationship between PEI and guilt, $F(1, 253) = 9.864$, $p < .001$, $\eta^2 = .038$, see Figure 3.1.

3.4.3 Environmental pride

Univariate analyses with pride as a DV also revealed a main effect of power, $F(1, 126) = 5.731$, $p = .017$, $\eta^2 = .022$, and PEI, $F(1, 126) = 22.143$, $p < .001$, $\eta^2 = .153$. A significant interaction effect between PEI and power, $F(1, 126) = 11.298$, $p < .001$, $\eta^2 = .084$, on pride was further observed. As hypothesised, the campaign design also resulted in a significant main effect on pride, $F(1, 253) = 37.587$, $p < .001$, $\eta^2 = .061$, yet did not reveal a significant interaction between the campaign and PEI, $F(1, 253) = 3.086$, $p > .05$, $\eta^2 = .012$, see Figure 3.2.

3.4.4 Donation task

Finally, a univariate analysis with PEI and power as independent variables (IV) and donation as a DV yielded a main effect of power, $F(1, 253) = 14.102$, $p < .001$, $\eta^2 = .053$. As shown in Figure 3.3, participants in the high-power condition ($M = 294.09$, $SD = 176.26$) donated more than participants in the low-power condition ($M = 214.52$, $SD = 140.63$). Moreover, a significant main effect of PEI on donation was found, $F(1, 253) = 23.735$, $p < .001$, $\eta^2 = .086$. Consistent with the predictions, results revealed a significant interaction between power and PEI on donation, $F(1,253) = 4.194$, $p = .042$, $\eta^2 = .016$.

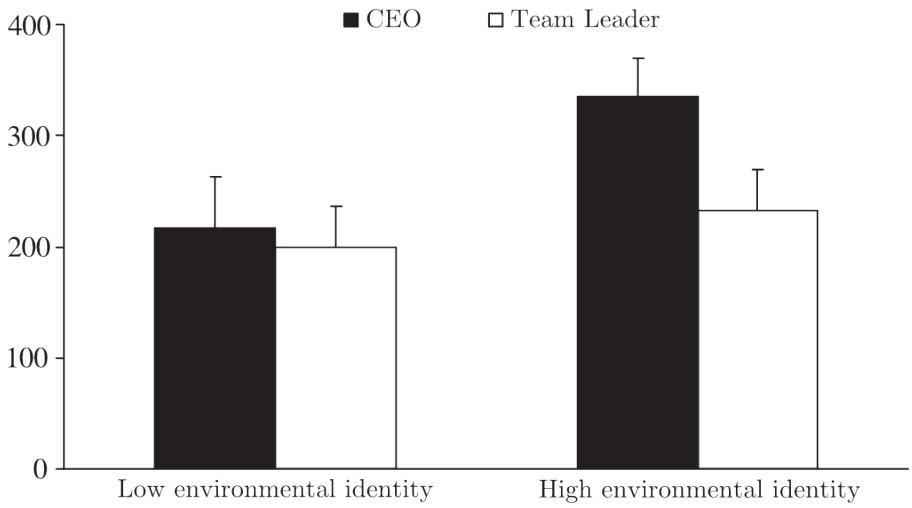

Figure 3.3: Effect of PEI on donation (amount (RMB) donated to charity) moderated by power amongst employees.

Simple effect tests showed that amongst those participants with high PEI, the amount donated was significantly higher in the high-power condition ($M = 337.02$, $SD = 157.74$) as opposed to the low-power condition ($M = 234.23$, $SD = 116.59$), $F(1, 139) = 13.653$, $p < .001$, $\eta^2 = .090$. Amongst participants with low PEI, the difference between the two conditions was not significantly different, $F(1, 113) = .287$,

$p > .05$, $\eta^2 = .003$. Furthermore, in the high-power condition, participants with high PEI donated more than those with low PEI, $F(1, 157) = 18.456$, $p < .001$, $\eta^2 = .106$. There was no difference between participants with high and low PEI in the low-power condition, $F(1, 95) = 1.294$, $p = .258$, $\eta^2 = .014$.

Moreover, results revealed a main effect using the campaign as an IV on donation, $F(1, 253) = 14.110$, $p < .001$, $\eta^2 = .053$, and a marginally significant interaction between campaign and PEI, $F(1, 253) = 5.569$, $p < .05$, $\eta^2 = .022$, on donation. There was no a three-way interaction between power, campaign, and identity on donation, $F(1, 253) = .587$, $p > .05$, $\eta^2 = .002$, see Table 3.1.

Table 3.1: Main and interaction effects on donation.

Variables	*N*	df	*F*	*p*	η^2
Power	253	1	14.102***	.000	.053
Emotion	253	1	14.110***	.000	.053
PEI	253	1	23.735***	.000	.086
Power × PEI	253	1	4.194*	.042	.016
Emotion × PEI	253	1	5.569*	.019	.022
Power × emotion	253	1	10.498**	.001	.040
Power × emotion × PEI	253	1	.587	.444	.002

Note: Significance noted as: p-value $< .10$ = *, p-value $< .05$ = **, p-value $< .01$ = ***.

3.5 Discussion

The present study contributes to corporate sustainability research by providing diverse insights on effective climate change communication through powerful presenters. Specifically, this study brings together research on top-down communication through powerful individuals (Bass & Steidlmeier, 1999; Hatfield et al., 1994) and environmental identity (Brick et al., 2017; Carfora et al., 2017; Schmitt et al., 2019; Whitmarsh & O'Neill, 2010) on predictors of environmental emotions and behaviour. Results show that identity is strongly linked to pride but only marginally to guilt and that the cultivation of power can be a potential mechanism to enhance emotions and

encourage pro-environmental behaviour. The study is amongst the first to examine and elucidate the circumstances under which powerful individuals can encourage pro-environmental behaviour. The study provides evidence that power can be a useful tool to appeal to those people who are usually less driven to behave sustainably. However, it was also found that power does not increase emotions and behaviour per se. Hence, the limitations and potential adverse effects of power are discussed below.

3.5.1 Environmental emotions

It was demonstrated that campaigns illustrating environmental damage elicited environmental guilt, whereas environmental protection triggered pride. This is in line with previous findings showing that collective actions can evoke guilt and pride (Becker et al., 2011) and amplify awareness of socially-desired behaviours (Tangney et al., 2007a; Tracy & Robins, 2007). As expected, guilt is linked to the presenter's ability to convey the message of environmental damage. Building on Baumeister et al. (1994), feelings of guilt are generated by assessing the behaviour of others; an effect that is amplified when powerful presenters advocate for it (Bass & Steidlmeier, 1999). More importantly, results show that no matter whether identity is high or low, participants feel more guilty when receiving messages from powerful presenters. Raising guilt even amongst participants with low identity demonstrates that power can be an effective method to make people feel guilty despite believing that they have done nothing wrong.

While power appears to be a strong predictor of guilt, identity has only a marginally significant effect. Specifically, in the low-power condition, there was no difference in levels of guilt between high- and low-identity participants. One potential explanation for the weak relationship between identity and environmental guilt might lie in the specific measurement of environmental identity. Similar to Lutwaka et al. (1998), who found that guilt only relates to personal but not social

or collective identities, environmental identity, as measured in this study, does not predict experiences of guilt.

Results further show that power and identity interact in predicting guilt. Specifically, participants in the high-power condition and with a high identity indicated the highest levels of guilt, followed by the high-power condition and low-identity participants. This confirms the view that guilt emerges due to a person's traits enhancing the cognitive information access and interpretation of external stimuli (Bargh et al., 1986; Bargh & Thein, 1985; Costa Jr & McCrae, 1995; DeCelles et al., 2012; Fiske & Taylor, 1991), particularly in instances in which a person receives messages from powerful individuals or authorities (Bass & Steidlmeier, 1999). Here, powerful speakers serve as agents using the principle of emotional contagion as an effective communication strategy (Tsai et al., 2013; Tsai et al., 2011). Since evoking guilt through powerful speakers is appealing to people who are less conscious of sustainable practices, it could be more effective in narrowing the often-found gap between intention and behaviour in the context of environmental psychology (Kollmuss & Agyeman, 2002).

Contrary to guilt, results on pride show that there is only a marginal difference between high- and low-power conditions, hence a low main effect of power. Specifically, while the highest reactions were again found in the high-power condition amongst participants with a high environmental identity, powerful speakers did not succeed in addressing low-identity participants using positive emotions. In fact, high power results in even lower pride levels than low power. Thus, powerful presenters may turn recipients of campaigns into a state of denial of environmental problems (Feygina et al., 2010) or helplessness believing that environmental actions have no impact (Salomon et al., 2017). While the study did not explicitly test for the opinion on the causes of climate change, these results constitute an interesting avenue for future investigations.

When identity is high, pride emerges regardless of the presenter's power. The findings are consistent with functionalist theories of moral emotions (Bretherton et al., 1986; Campos et al., 1994), suggesting that experiences of pride emerge from a realisation of what is an accepted or desirable behaviour (i.e., descriptive standards). Accordingly, participants use positive stimuli as moral post-hoc realisations of past behaviour, which in turn results in feelings of pride (Haidt, 2008; Haidt & Hersh, 2001; Schwitzgebel & Cushman, 2012). In an environmental context, the results suggest that power increases pride only when consequences of environmental actions and ongoing climate change are salient (i.e., amongst participants with a high PEI), indicating that power does not evoke emotions per se. Taken together, when presenters and advocates of environmental policies face an audience with rather low identification with the environment, the presenter's power is negligible.

3.5.2 Environmental behaviour

Since donation was predicted by power and identity, both separately and jointly, results allow drawing conclusions on actual environmental behaviour. In line with results on emotions, the highest amount donated was found amongst participants in the high-power condition and with high environmental identities. In addition, together with identity, the campaign framing moderates the participants' willingness to donate, hence demonstrating a successful emotional manipulation. Here, participants in the pride condition donated significantly more than those in the guilt condition, corroborating the findings of Bissing-Olson et al. (2016). Moreover, when comparing all four emotion and power conditions, the highest amount donated was found amongst participants in the high-power and pride conditions. This was followed by the negative-emotion and high-power group. Results demonstrate that the joint usage of emotions and power can be an effective tool in climate change communication. However, results also indicate that power is a stronger predictor in stimulating pro-environmental behaviour than emotions.

The findings are particularly interesting as they contradict Lin et al. (2016), who found that a leader's display of appropriate behaviour was positively linked to moral licensing and a decline in pro-social behaviour. One potential explanation might lie in the nature of environmental decisions. While actions such as stealing office supplies or fare-dodging might be considered to have no lasting harm, environmental violations fall under the realm of collective damage (Rees & Bamberg, 2014; Tompkins & Adger, 2004) and thereby have a societal impact attached to it. The results perhaps also differ because the sample stems from a collectivist culture where power is strongly associated with authority (Pasa, 2000).

Consequently, this study further contributes to the scholarship of power in collectivist cultures. Studying power dynamics in China presents unique circumstances as the cultural, social, and political landscape is distinct from Western countries. The study suggests that power dynamics in China are not unidirectional but rather involve agency on the part of both those in power and those who are subordinated. This finding highlights the importance of understanding power dynamics as a complex, dynamic process that involves negotiation, perception of environmental issues, and agency on the part of all actors involved.

Lastly, in the realm of corporate sustainability, the findings add to those of Griskevicius and colleagues (2010), who demonstrated that status could encourage pro-environmental behaviour in the workplace. However, in their study, the positive impact could only be maintained as long as the action and its outcome were shown publicly. This research indicates that power prompts pro-environmental behaviour not only in a public environment but also in conditions where one's contributions are hidden from other participants and the amount of the donation is not revealed. In sum, the results confirm the view that appraisals of other peoples' advocacy can prompt affective states and subsequent solution-oriented or pro-social behaviour (Tangney & Dearing, 2003; Tracy & Robins, 2007).

3.5.3 Limitations and future research

The characteristics of the sample (i.e., stemming from a collectivist culture) might limit the results. A high sense of authority and significant media restrictions (e.g., on the causes of climate change; see Zhao, 2012) might confound the implications of the results. Since authorities, such as chief executives, are naturally associated with a higher power in China, it would be of interest to drive a cross-cultural comparison using cultures with a lower power distance. However, this does not necessarily limit the results of this study but instead poses an interesting avenue for future research. Similarly, while the study was conducted in Shenzhen, China, it is important to note that China is a complex and culturally diverse country. While the discussion makes assumptions on the implications of power in collectivist cultures, it would be fruitful to not only drive cross-cultural comparisons but also to conduct studies within different regions in China, especially those that are less prosperous than Shenzhen.

Additionally, organisational leaders have successfully been employed as powerful individuals. It would be a fruitful avenue to use the experimental framework and examine different presenters (such as politicians, NGO leaders, or academics), who embody environmental advocacy. It may also be of interest for future research to build on the findings and vary a number of other environmental emotions. While power was a significant predictor of guilt, it remains open whether this effect occurs on negative emotions in general or whether it is a specific effect only associated with feelings of guilt. It is recommended to test for emotions of shame, anger, or fear in the future. The same holds for pride, which could be distinguished from other positive emotions, such as happiness or optimism.

3.6 Conclusion

This study investigated the moderating effect of power on the relationship of identity, experiences of environmental guilt and pride, and environmental behaviour. The goal was to reveal indicators of effective climate change communication through powerful presenters. In sum, power is effective in mobilising people to act pro-environmentally regardless of their environmental identity. This study is amongst the first to illustrate the value of using power in environmental campaigns as well as identifying ways to appeal to those people who are usually less driven to behave sustainably. Demonstrating this result across both emotions of guilt and pride as well as actual environmental behaviour speaks to the importance of studying and applying emotional power in environmental contexts. However, power also has its limitations. While power predicts elevated guilt amongst all participants, it showed no effect in raising pride amongst low-identity participants. Top-down communication is therefore not the most effective communication strategy in all cases. Rather, it is strongest when identity is high or campaigns are negatively framed. Policymakers are advised to consider the presenter's level of power as well as the predisposition of their audience before designing environmental campaigns, as positive and negative emotions might have different effects.

4 | Chief sustainability officers: Ceremonial conformity or sincere environmental responsibility?

"All that glisters is not gold;
Often have you heard that told.
Many a man his life hath sold
But my outside to behold.
Gilded tombs do worms enfold."

– William Shakespeare, *The Merchant of Venice* (1596–1599).

4.1 Overview

The past two decades have seen a remarkable shift towards increasing climate change awareness and reducing carbon emissions. As noted in chapter 2, the trends of ongoing climate change have increased pressure from shareholders and employees leading to the realisation that changing products and services to signal environmental awareness may not suffice. To cope with environmental pressures, a new trend has

emerged whereby organisations take a top-down approach and structurally change their top-leadership teams to be more sustainability focused. Specifically, more and more organisations appoint a senior executive devoted to designing and advancing corporate environmental initiatives, a person that is often referred to as a Chief Sustainability Officer or CSO. As of 2020, 95 of the Fortune 500 companies have appointed a CSO, and the trend is rising exponentially (Financial Times, 2021).[1] Thus, the second study in this dissertation builds on the notion of top-down communication and further explores how corporations and organisational leadership can increase environmental advocacy.

Appointing an executive specialising in sustainability to the C-suite has several theoretical advantages. Leaders from a specific technical domain are often better equipped to cope with resistance and conflicts given their industry network (Naranjo-Gil et al., 2008; Nuscheler et al., 2019; O'Reilly et al., 1998) and technical expertise (Hambrick & Mason, 1984; Simons et al., 1999), both of which provide them with relevant and sector-specific insights. This unique background allows CSOs to serve as advisors to different departments and guide them both technically and ideologically towards advancing corporate practices. Appointing a sustainability executive also increases diversity in the top-management tier and provides a juxtaposition to economically focused executives, which in turn increases the likelihood of meeting the triple bottom line of financial, social, and environmental agendas (Hahn et al., 2014; Van der Byl & Slawinski, 2015). Lastly, a sustainability officer can act as the public face of the company and communicate the company's sincerity regarding its environmental impact to shareholders, policymakers, and the media.

All of the above should theoretically increase environmental awareness within an organisation and, ideally, increase a company's environmental performance. However, several studies investigating the impact of CSO appointments on financial and

[1]Examples include Apple, AT&T, Coca-Cola, Kellogg's, MasterCard, Microsoft, Nike, Nissan, P&G, Ralph Lauren, Tyson Foods, and Verizon.

environmental performance have found no significant advantage of employing a CSO. In some cases, the presence of a CSO even led to an inverse effect on environmental performance (Kanashiro & Rivera, 2019). One potential answer as to why this result emerges is that the CSO merely serves a symbolic purpose rather than create actual change. This argument builds on the idea that newly created executive structures can signal 'ceremonial conformity' (Boiral, 2007; Springett, 2003) whereby the company to adopts prominent public initiatives that are in line with societal expectations while making no changes to its core operations (Meyer & Rowan, 1977).

This ambiguity between theoretical concepts and actual performance data raises the question of whether organisations are ill-advised in appointing a dedicated sustainability advocate to the C-suite or whether previous studies have potentially missed the actual impact of such executives. Thus, analogous to Shakespeare's observation that not all that glisters is gold, the present study explores whether CSOs create actual environmental change or merely serve a symbolic purpose.

The present study addresses this question by examining the detailed career histories and skills of environmental leaders and executives. Drawing from actual CV data including 10,007 individuals from 29 countries, this research addresses Menz's (2012) call for further research on the influence of the distinct skills needed to establish more diverse top-management teams. This goal is achieved by mining data from an online talent database and employing a novel machine learning approach to find patterns in a wide range of skills. In doing so, this paper aims to highlight the importance of functional heterogeneity in leadership teams and thereby provide both researchers and practitioners with more nuanced insights on corporate sustainability strategies.

Examining the skills needed to excel in the role of a CSO is grounded in the upper echelons theory (Hambrick & Mason, 1984; Ting et al., 2015) whereby

executives make judgements based on their perceptions, the professional skill set they have accumulated over their career, and the conditions they are confronted with inside the organisation (Hambrick et al., 2015; Jones & Cannella, 2011; Menz, 2012; Miller et al., 1998; Nuscheler et al., 2019). The focus lies on identifying several key distinctions (i.e., internal vs. external hire, functional background, firm attachment, leadership skills, and demographics) between sustainability officers and other executives. This research aims to present company leaders and policymakers with theoretical and empirical insights gained from actual career data and derive potential managerial implications for all companies intending to appoint a CSO.

When comparing CSOs with other executives, results reveal that CSOs join the C-suite at a younger age, have less leadership experience, are better educated, and are more likely to be female. Results also indicate that CSOs are generally more loyal than other executives, i.e., they change their firm less frequently. Despite higher loyalty, companies prefer to hire external CSOs rather than promote existing employees to their top-management positions. Those who stay with the organisation for a long time are trusted with external communication tasks, PR, and crisis management. In comparison, new hires work on internal tasks, change management, and risk prevention. Taken together, results suggest that organisations may employ a CSO to signal ceremonial conformity. However, the diversity of skills and the differences found between executives highlight the distinctiveness of the role. CSOs with a strong technical background and effective communication skills can help organisations to increase environmental legitimacy, making the hiring decision warranted.

4.2 Literature review

4.2.1 Company management and the role of the CSO

The senior management is a comparably small group of individuals that represent the company leadership (Strand et al., 2015). Often referred to as the C-suite, it is the inner circle of leaders responsible for developing, clarifying, and implementing strategic corporate initiatives (Guadalupe et al., 2014). Individuals of the C-suite generally assist the CEO in achieving the strategic agenda by providing functional insights and leading their respective departments (Menz, 2012). According to Hendricks et al. (2015), the top-management team is the primary driver of business strategy, and the CEO's choice to appoint members to the C-suite is amongst the most important decisions she will make.

The traditional corporate leadership is composed of a CEO, chief financial officer (CFO), chief operating officer (COO), and chief technology officer (CTO). Recent trends show that the composition of executive teams has changed dramatically over the last decades. For example, the number of CFOs was lower than 5% in the 1970s (Zorn, 2004), whereas today, almost every large company has appointed a financial executive. More importantly, there is also a tendency towards expanding the board of directors and including a wider variety of tasks in the C-suite (Guadalupe et al., 2014). In fact, recent research found that companies have started to extend the core C-suite with non-traditional roles (Svejenova & Alvarez, 2017) and stressed that appointing (non-CEO) executives typically favours the strategic interests of an organisation (Buyl et al., 2015; Greve et al., 2009; Menz, 2012).

The executive team is both a manifestation of a company's organisational structure and a representation of expertise and values that a company presents (Guadalupe et al., 2014). With the increased institutional complexity, changing

markets, and increased stakeholder expectations to care about the environmental footprint of organisations, along with the trend of moving away from traditional C-suite appointees, it becomes increasingly likely that organisations will hire a sustainability executive to the C-suite to reflect the company's commitment to environmental issues.

The CSO is a senior executive in charge of an organisation's environmental strategy. CSOs are not the same as environmental managers because the latter are intermediate managers in charge of certain industrial areas or functional departments. The CSO sits at the top of the corporate ladder and reports directly to the chief executive or the board. Given the comparably low number of companies appointing CSOs and the relative novelty of this research domain, there is no universal definition of the detailed responsibilities for this role, and the duties often depend on the unique situation of the company (Henderson et al., 2015). Generally, the CSO has a functional commitment to and primary accountability for corporate responsibility outcomes (Strand, 2013). She or he is responsible for setting the company's environmental direction, making decisions on specific strategic issues, and ensuring that the company's environmental plans are carried out. Depending on the organisational context, CSOs can also be associated with compliance tasks, such as health and safety (i.e., EHS), governance (i.e., ESG), or social responsibility (i.e., CSR).

4.2.2 Upper Echelons Theory

Due to the diversity of responsibilities faced by CSOs, understanding the skills that make for an effective environmental leader becomes particularly important. The primary theoretical construct that is used to understand top-management teams and their skills is the upper echelons theory (Hambrick, 2007). According to the theory, the senior executives' functional backgrounds are essential in shaping the firm's strategic direction (Carpenter et al., 2004). Previous career paths, education, network, and skill sets all differ amongst individuals in the upper tier (i.e., members

of the C-suite). The theory further proposes that personal traits (i.e., upper echelon attributes) influence executives' decisions and thereby impact a company's success (Hambrick, 2007; Hambrick & Mason, 1984). As most executives serve a specific role in the company leadership, their effectiveness depends on a unique set of skills that differs across members of the C-suite (Nath & Mahajan, 2008).

Consequently, the upper echelons theory follows the notion that executives are essential in regard to performance goals and reaching an organisation's strategic agendas (Wang et al., 2016). The theory argues that leaders have two distinct skills that make them valuable to organisations. Firstly, effective leaders can react to and solve technical challenges on a micro level. Thus, apart from leading their respective departments, they can reduce complexity, eliminate ambiguity, and advise other leaders with their knowledge and expertise (Carpenter et al., 2004). Secondly, they increase business innovation and specialisation (Daellenbach et al., 1999), change and transformation (Cho & Hambrick, 2006), and social policies (Reimer et al., 2018) on a macro level.

The present study proposes that analysing the upper echelon attributes of senior managers becomes particularly suitable when investigating sustainability initiatives. Environmental activities are inherently complex. They are capital intensive, take a long time to plan and implement, and influence the company and society as a whole. Drawing from previous research, coherent senior leadership styles are critical in determining a firm's social commitment to environmental and societal expectations (Al Halbusi et al., 2020; Algera & Lips-Wiersma, 2012). To date, most attention has been placed on a CEO's involvement in an organisation's strategic sustainability commitments, postulating that the CEO is the person who develops and implements a company's green initiatives (Marais, 2012; Ullah et al., 2019; Wu et al., 2015).

However, according to Eliopoulos et al. (2017), many CEOs emphasise generalistic objectives that may or may not include sustainability concerns. They also typically lack the necessary knowledge or skills to address complex sustainability prospects. Sustainable leadership entails a thorough understanding of both operational and strategic challenges, which many corporate leaders lack (Weinreb, 2011). In a similar vein, Waldman et al. (2006) recognise that chief executives often struggle to balance environmental initiatives with the interests of other executives and shareholders (e.g., increasing short-term spending and reducing profit distribution for environmental purposes). Consequently, CEOs might be ill-fitted to design and drive sustainable leadership effectively. Waldman et al. (2006) encourage future studies to examine other members of the executive branch in their sustainability efforts.

4.2.3 Opportunities and challenges for appointing a CSO

Hiring a CSO can bring several advantages to an organisation. From a theoretical perspective, appointing non-traditional executives can increase the diversity of the leadership, balance opposition, reduce biases and groupthink, and increase profitability (Hunt et al., 2015; Moss-Racusin et al., 2016; O'Connor, 2002; Shields, 2010). A senior-management team with different functional backgrounds and a broader range of expertise and viewpoints can make better decisions on both essential and complex topics (Cannella Jr et al., 2008; Marcel, 2009). However, practically speaking, having more members in the C-suite can dilute voting rights and cause longer decision-making chains. Smaller boards are easier to coordinate and are more likely to define clear responsibilities and accountability. In light of this ambiguity, the question emerges: Under which circumstances is hiring an executive dedicated to sustainability warranted?

Signalling effects

Restructuring the top management signals internal and external stakeholders about the importance of a particular managerial focus and highlights an upgrade of the firm's strategic agenda. Internally, establishing a new executive role informs other members of the top-management team about the necessity of creating change, which can help increase awareness and collaboration across various departments inside the firm. Integration and orientation of multiple departments are essential in establishing and incorporating strategies (Joshi et al., 2003). Externally, the appointment sends a message to stakeholders that the company is serious about enhancing performance in a certain area. Appointing a sustainability officer is a critical step in moving a company through the corporate responsibility phases (Wiengarten et al., 2017). From a stakeholder perspective, it is an important step towards achieving the company's CSR goals. As a result, it facilitates the enhancement of the company's reputation, which can stimulate sales and attract investors (Roberts & Dowling, 2002). Consequently, hiring a CSO signals to various stakeholders that the company is taking sustainability initiatives seriously (Wiengarten et al., 2017).

Technical skills

Modern management and leadership literature propose that a diverse executive team can increase performance outcomes as well as facilitate change across an organisation (Buyl et al., 2011; Cannella Jr et al., 2008; Jayne & Dipboye, 2004; Kilduff et al., 2000; Nielsen & Nielsen, 2013). Diversifying functional roles in the executive branch thus increases the amount of non-redundant information, skills, and views (Cheruvelil et al., 2014; Kim & Starks, 2016; Yukl & Mahsud, 2010), facilitates awareness (Olson et al., 2007), and stimulates change (Naranjo-Gil & Hartmann, 2007). According to Lubin and Esty (2010), the CSO assists other executives in visualising objectives and complementing the strategic outlook from the standpoint of

sustainability. As functional experts, CSOs are expected to bring a certain repertoire of skills and expertise in dealing with the social or environmental issues and conflicts that come with corporate sustainability, allowing them to improve decision making (Del Missier et al., 2010) and assisting the business in managing divergent stake- and shareholder relationships (Wiengarten et al., 2017). As a result, an appointee with appropriate experience in dealing with environmental and social issues should be able to professionalise these procedures.

Existing network

An appointee with an appropriate functional background is more likely to draw from existing affiliations with other industry leaders and experts. Being part of sector-specific networks increases access to knowledge, new technologies, and innovation, as well as talent and funding (Roche et al., 2020). To meet sustainability objectives, the executive must also assist the company in broadening and deepening its ties with diverse stakeholders, such as environmental organisations and NGOs. Thus, appointing a CSO as a member of the C-suite is expected to increase the leadership's ability to achieve a better sustainability performance. In fact, network effects and knowledge spillovers are particularly important for sustainability projects, as will be illustrated in Chapter 6 of this dissertation.

Power and authority

A senior manager focused on sustainability strategy is more likely to implement a cohesive environmental strategy across the company. Without top-management support, mid-level managers may only focus on one department, limiting the likelihood of organisation-wide change. This can lead to interdepartmental conflicts that obstruct problem awareness and strategy implementation across departments (Misangyi et al., 2017; Tantalo & Priem, 2016). Different middle managers' perceptions of institutional constraints result in inconsistent actions that deviate from formal organisational norms

(Helfat et al., 2009). Moreover, cross-functional projects are likely to face resistance within the organisation and are more difficult to implement due to corporate bureaucracy. Mid-level environmental managers often lack the power to execute initiatives that increase environmental performance beyond compliance levels (Cordano & Frieze, 2000) and are less effective in stimulating change amongst their constituency (Speckemeier & Tsivrikos, 2021). Consequently, CSOs are more likely to overcome hierarchical challenges and are better positioned to reduce opposition to environmental initiatives.

Taking all of these arguments together, for environmental policies to be translated into organisational strategy, functional diversity within the top-management team appears to be desirable, if not required (Henri & Journeault, 2010). However, appointing a dedicated chief sustainability manager also has its challenges. CSOs often encounter distinct obstacles compared to other chief executives. They must (a) comprehend how environmental impact can be measured and evaluated, (b) determine whether and how it can add value to the firm, (c) integrate sustainability into the firm's core strategy rather than treating it as a sideline activity, (d) combine long-term goals with short-term financial strains, and (e) decide if it is possible to satisfy all stakeholder expectations (Kanashiro & Rivera, 2019; Wiengarten et al., 2017). An executive without the right skill set may not be able to cope with these challenges and, as a result, primarily serve as a symbolic hire.

Given the unique opportunities and challenges associated with CSO appointments, this chapter aims to analyse firm hiring decisions to determine the factors that went into the decision and the skills needed to excel in this role. Through the lens of upper echelons theory, the skills portrayed by executives working in this role are examined. Moreover, by looking at detailed career histories, the individual trajectories that typical sustainability experts take to reach the top-management teams, whether they are hired internally or externally, and how experience, tenure, and firm loyalty affect the responsibilities they are entrusted with are analysed. The results will provide

implications about the merits of the role, specifically whether CSOs primarily serve a symbolic purpose or whether organisations are actually putting them into positions where they are able to create change.

4.3 Method

A novel dataset was collected from a global online talent database. The database is specifically designed for active and passive job seekers with >75,000 USD income per year, and individuals join the database to extend their professional network, connect with potential employers, and advance their career development. Using an online database has several advantages. Individuals can enter as many career details as they deem relevant, allowing researchers to draw from a large pool of entries. Additionally, the entries are semi-structured with both prescribed templates and areas for free articulation of experiences and skills. Lastly, candidates enter the database to be headhunted and connect with other professionals. This increases the chance of candidates entering their data truthfully and realistically to avoid misconceptions in later stages of the interview process, which reduces the social proof bias.

To obtain a representative sample, two main search strategies were used. First, the sample was filtered by using sustainability-related search terms. Based on the preceding research by Strand (2013, 2014), the keywords included, for example, 'chief sustainability officer', 'corporate sustainability officer', 'vice president, sustainability', 'green', 'environment', and 'sustainability'. A full list of the search terms is outlined in Appendix 7.6. This study aims to compare CSOs to other executives and examine employees working in different sustainability positions across the corporate hierarchy. Thus, chief executives, junior managers, and sustainability specialists were included in the study. The group working in sustainability positions makes up 50.8% of the total sample.

The second half of the sample was selected based on management experience without a functional or departmental focus. To provide theoretical implications for the upper echelons theory, the search terms used for the remaining part of the sample were based on the theory's definition of upper or top-management functions. Since this part mainly serves as the control group, only C-suite executives were included. As titles can differ across countries (e.g., General Manager in Germany or Managing Director in the UK), the search terms have been adjusted accordingly. Students and recent graduates were specifically excluded from the sample.

The database offers two types of data: Self-assessed skills and actual career history data. Each entry follows a specific template for individuals to input their career histories. The information solicited includes career aspirations (such as target position, target industry, salary expectation, willingness to travel, willingness to relocate, and openness to new positions) as well as academic and professional positions. Especially the latter allows for computing variables to be established based on previous trajectories, such as job-change rate, firm attachment, tenure, and age of becoming a member of the C-suite. Additionally, each individual is given a chance to enter several skills, certificates, and other achievements outside of the traditional resume frame. Candidates can enter as many skills as they deem appropriate, and there are no prescribed categories. Compared to traditional methods, such as surveys or personality assessments, drawing from an online database allows getting actual, self-reported expertise of executives and lets individuals describe their self-perceived expertise freely while avoiding prescribed answer options.

The final sample contains 10,007 individuals from 29 countries. The countries included in this study are Australia, Austria, Belgium, Bulgaria, Canada, China, Czech Republic, Denmark, England, Finland, France, Germany, Greece, India, Ireland, Italy, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, Romania, Russia, Singapore, Spain, Sweden, Switzerland, and the USA (see Table 4.1).

Table 4.1: Descriptive statistics (dichotomous variables).

Variables	*Coding*	*N*	*%*
C-suite	CEO	2565	25.6
	CFO	708	7.1
	CTO	1138	11.4
	COO	508	5.1
	CSO	608	6.1
	Lower management	4480	44.8
	Total	10007	100
Gender	Female	4852	48.5
	Male	5155	51.5
	Total	10007	100
Country	Germany	3083	30.8
	Switzerland	512	5.1
	BeNeLux	737	7.4
	France	697	7
	Spain	619	6.2
	Scandinavia	634	6.3
	United Kingdom	1636	16.3
	other European countries	813	8.1
	non-European countries	795	7.9
	unidentified	481	4.8
	total	10007	100
Industry	Public Service	499	5.0
	Financial Services	1123	11.2
	Manufacturing	2023	20.2
	Consulting	2178	21.8
	Telecommunications	576	5.8
	Pharma and Life Science	383	3.8
	Software	478	4.8
	Internet Services	1016	10.2
	Retail	558	5.6
	Tourism	307	3.1
	Others	866	8.7
	Total	10007	100

Note: BeNeLux includes the countries: Belgium, the Netherlands, and Luxembourg. Scandinavia includes the countries: Denmark, Norway, Finland, and Sweden. United Kingdom includes the countries: England and Ireland. Other European countries include: Austria, Bulgaria, Czech Republic, Greece, Italy, Poland, Portugal, and Romania. Other non-European countries include: Australia, Canada, China, India, Mexico, Russia, Singapore, and the USA.

With an average age of 45.9 and 67.2% being at least the head of a department, the majority of participants hold a senior position. This is also reflected by the median annual salary of 120,000 USD. Slightly more participants are male (51.5%), and 57.7% have at least completed a master's degree. 5,526 (55.2%) participants are members of the C-suite, and 608 (11.0%) of those are CSOs.

4.3.1 Independent variables

Several predictor variables were computed based on career history or taken directly from the candidate profiles to examine the differences between CSOs and other C-suite executives.

External hire. To examine whether an executive was promoted from within the organisation or hired externally, this dummy-coded variable was constructed. It takes a value of one if the person was hired externally.

Firm attachment. As a measurement of loyalty to the company, the variable was constructed by counting the duration (in months) of which the person has worked for a company in relation to the total working time. Total working time counts the number of months after graduating from the highest respective degree until the time of data collection (December 2021).

Change rate. To calculate the change rate, the total working time (in months) was divided by the number of job changes. The result, the average time per job, is then divided by the total working time. For instance, assuming two individuals have worked for ten years (i.e., 120 months), person A, who has worked in only one company since graduation, will end with a rate of 1, whereas person B, who has changed the job five times in ten years, ends up with a value of 0.2. Finally, to avoid misconceptions about the positive connotation of the variable label, the value is inverted in the last

Table 4.2: Descriptive statistics (continuous variables).

Variables	*Coding*	*N*	*Min*	*Max*	*M*	*SD*	*p50*
Firm attachment	Duration (in months) a person has worked for a company / total working time (in %)	10007	0.01	1	0.46	0.32	0.39
Change rate	(total working time / number of job changes) / the total working time (in %)	5526	0.01	1	0.34	0.31	0.20
Tenure	Total experience in role (in months)	5526	0.01	1	0.28	0.23	0.21
Age at becoming a CxO	Age at which person becomes a C-suite member for the first time (in years)	5526	28	78	48.35	10.98	48
Leadership	Ranges from 0=no experience to 3=more than 5 years	10007	0	3	2.34	0.96	3
Job status	Person is 0 = not, 1 = passively or 2 = actively looking for a job	10007	0	2	0.66	0.70	1
Firm size	Number of employees (ordinal scaled) ranges from 0 = SME to 7 => 100.000 employees	10007	0	7	4.36	1.67	5
Age	Measured in years	10007	18	92	45.76	9.93	46
Education	Ranges from 1 = high school / vocational college to 4 = PhD	10007	1	4	2.40	0.92	3
Languages	Number of languages spoken fluently	10007	1	10	2.32	1.23	2

Note: Education includes: 1 = high school / vocational college, 2 = bachelor degree, 3 = master degree / MBA, 4 = PhD. Firm size includes: 1 =< 10, 1 = 10–100, 2 = 101–500, 3 = 501–1,000, 4 = 1,001–5,000, 5 = 5,001–20,000, 6 = 20,001–100,0000, 7 => 100,000. Leadership variable includes: 0 = no experience, 1 = up to 2 years, 2 = 2 to 5 years, 3 = more than 5 years.

step. High change rates thus equal higher index scores, and low change rates equal lower scores.

Tenure. The duration (in months) is counted to measure the experience a person has within a certain role. This variable counts experience regardless of previous employers.

Age at becoming a CxO. This variable indicates the age at which a person has first been promoted to the C-suite level. This level includes all executive positions and thus counts individuals' first time joining the executive level regardless of whether the person first becomes a CxO and later a CEO.

Leadership. This variable reflects a person's leadership experience in years.

Job status. Candidates on the job platform can indicate whether they are 'actively' or 'passively' looking for a job. They also have the option of selecting 'not searching'.

Lastly, the following analyses controlled for three demographic (gender, age, and education) and three organisational (firm size, country, and industry affiliation) variables. A detailed overview is displayed in Table 4.2.

4.3.2 Skills

Each candidate in the database can indicate as many skills as she or he wants. This allows for composing a comprehensive skill profile for each individual. With 13,505 unique keywords and 10,007 participants in the sample, the dataset counts a total of 86,875 skills resulting in an average of 8.7 skills per person. While this breadth of entries offers a unique opportunity to analyse self-described skills across a wide range of individuals, it also limits the use of conventional econometric analyses. Thus,

a technique for automatic topic modelling called 'latent Dirichlet allocation' (LDA) is used to address this complexity and effectively compare the skills.

LDA is a machine learning technique that finds hidden structures in documents and allows to assign overarching categories (Kumar et al., 2012; Sajjadiani et al., 2019). In this study, the LDA is used to match cohesive skills and is aimed at identifying the underlying competencies amongst executives. This approach is inspired by a seminal study conducted by Bandiera et al. (2020), who employ a similar method to identify unstructured CEO skills and performance data.

In technical terms, LDA models a generative probabilistic process that can be used to find and infer hidden topics in a corpus of documents. Such documents are represented as an unordered set of words and, in this case, correspond precisely to the sets of skills from each participant. Based on a corpus, the LDA models each document as a random mixture over a set of latent topics and assumes an underlying process on how these were generated. In this process, a topic is characterised by a multinomial distribution which assigns each word (in the corpus' vocabulary) a probability that quantifies how predictive a word is for a given topic. By training a LDA model, the goal is to learn and approximate the generative process that could have generated a given corpus. Subsequently, a trained model then allows to infer the random mixture of topics from a document (i.e., the structure of how the model thinks it was generated), which effectively enables the representation of high-dimensional documents by a low-dimensional topic vector.

The ability to discover latent topics by analysing the co-occurrence of words in documents makes LDA particularly suitable for studies involving textual analysis, such as identifying underlying skills among executives. In contrast, other methods like PCA (Principal Component Analysis) and LASSO (Least Absolute Shrinkage and Selection Operator) have distinct purposes and limitations when applied to text data.

PCA, a versatile dimensionality reduction technique, is used to identify orthogonal axes (principal components) that capture the maximum variance in the data. While PCA can be applied to various data types, including continuous and discrete variables, it is less suitable for high-dimensional, sparse text data. This is because PCA relies on covariance structures that may not be meaningful for text data, where the identification of latent topics is often of greater importance. Notably, Tipping and Bishop (1999) demonstrated that it is possible to establish a probabilistic basis for PCA through a Gaussian factor model with a spherical covariance matrix when the variance approaches zero (Bandiera et al., 2020). Nonetheless, the data in the current study does not follow a Gaussian distribution, rendering PCA's statistical interpretation less clear and applicable in this particular scenario. Similarly, LASSO is a well-known linear regression method used for variable selection and regularisation. Although LASSO effectively deals with continuous or categorical variables in regression settings, it is less suitable for text data. Text data typically requires topic modelling, which is not the primary focus of LASSO.

In light of these comparisons, LDA stands out as the most suitable method for this study, which seeks to identify underlying competencies among executives using textual data. The method's inherent focus on capturing and interpreting the thematic structure of text data allows for a more accurate and meaningful analysis when compared to other statistical methods like PCA and LASSO.

In more concrete terms, the LDA model assumes that different competencies of a CxO are a mixture of a large number of underlying skills and that the creation of each functional role is attributable to pure competencies. LDA-based topic modelling aims to uncover overlapping word clusters in a textual corpus of candidate profiles. As outlined in Figure 4.1, the process includes three main steps: Data mining, data processing, and data analysis.

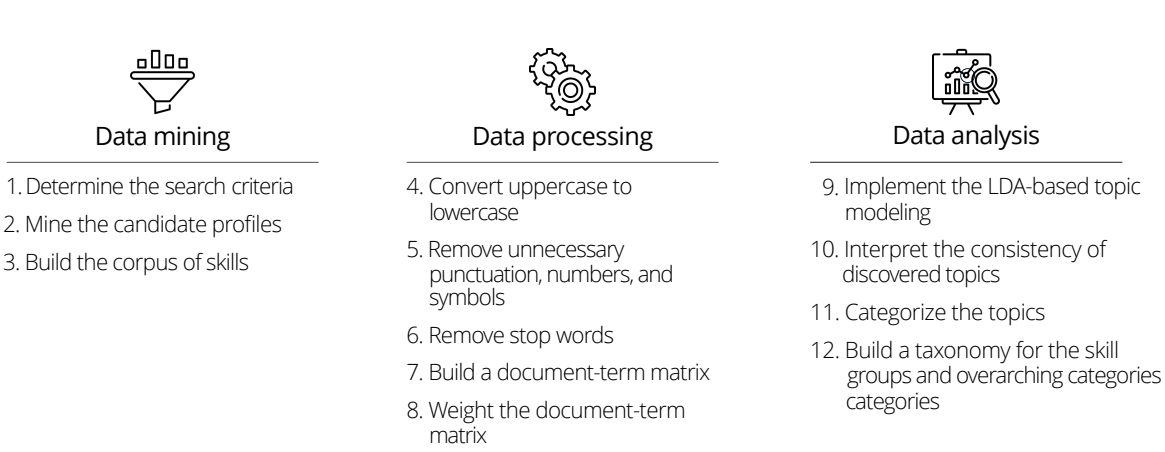

Figure 4.1: Overview of the LDA methodology.

Pre-processing is critical for improving the quality of unstructured text data analyses (Gurcan & Cagiltay, 2019; Kantardzic, 2011; Kyriakopoulou & Kalamboukis, 2013), especially for user-created data in online sources. For pre-processing, the textual information was first separated into words (tokens), also known as tokenisation (Karl et al., 2015). Since the database includes entries from multiple countries, individuals occasionally entered their skills in their local language. All tokens were translated into English using the Google Translate API (see, Prates et al., 2020, for a similar approach). Subsequently, unnecessary characters, punctuation, hashtags, and stop words were removed from the token (Williams & Betak, 2018).[2] Lastly, without loss of meaning, manual phrase replacements were further conducted, for example, by matching 'BD' with 'business development' or 'HR' with 'human resources'.

After completing the pre-processing steps, each person was represented by an unordered set of tokens (skills) on which a quantitative analysis could be performed (Karl et al., 2015). The 'bag of words' technique was used to extract information on word frequencies without taking into account their order (Agirre et al., 2009). The final dataset consists of 86,875 total skills ranging from 1–64 skills per person.

[2]A complete list of the removed stop words can be found in Appendix A

Next, the model has been tested for reliability. Given that the following analysis emphasises the categorisation and clustering of tokens, a perplexity analysis is conducted. Perplexity is a metric designed to assess the performance of probabilistic models (Chen et al., 1998). It calculates how accurately a model predicts a given sample by determining the reciprocal of the geometric mean of per-word likelihood. Lower perplexity signifies a superior model since it implies the model is less *surprised* by the terms in the test documents (Abdallah et al., 2019). In interpreting perplexity values, it is important to note that there is no universal standard for a *good* value. Lower perplexity values are generally considered better, as they indicate that the model is less *surprised* by the words in the test dataset. The purpose of the analysis is to compare perplexity values for different models or model configurations. Thus, the analysis below tests different numbers of topics ranging from 5 to 20 to see which one gets the lowest value.

The perplexity analysis conducted with the current dataset yielded the following results: Number of topics: 5, perplexity score: -7.3; number of topics: 10, perplexity score: -7.0; number of topics: 15, perplexity score: -7.1; Number of topics: 20, perplexity score: -7.2. The model with 10 topics has the lowest perplexity score (-7.0) and is considered the best among these configurations. The following analysis will therefore use 10 topics as the standard.

The resulting skills presented in Table 4.4 were kept in their original format, apart from spelling mistakes and aligning different languages. The labels of the discovered categories were assigned manually. Overall, the analysis revealed a total of 38 skill groups, which were mapped into nine core competencies (Chang et al., 2009). Analyses for more and less than nine competencies were also conducted, but it was found that the groups shown in Table 4.4 present the most comprehensible illustration.

4.4 Results

Preliminary findings based on Pearson correlations are summarised in Appendix B. When conducting mandatory collinearity statistics, the variable 'age at becoming a C-suite member' was found to strongly correlate with the demographic control variable 'age'. To avoid multicollinearity, the age variable was excluded from the analyses. The maximum variance inflation factor is 1.659 across all models for all other variables. This value is lower than the usual threshold of ten and lower than the stricter requirement of six (Craney & Surles, 2002). The analyses used in this study showed no other effects of multicollinearity.

4.4.1 Difference between CSOs and other C-suite executives

Table 4.3 compares CSOs with other members of the C-suite, namely CEOs, CFOs, CTOs, and COOs. The first model, OLS-1, enters external hire as a predictor ($\beta = .333$, $SE = .010$, $p < .001$). The variable is positive, significant, and strong in magnitude across all models. This indicates that sustainability executives are more likely to be hired externally rather than work their way up the internal corporate ladder. This finding is further supported by a lower firm attachment ($\beta = –.115$, $SE = .013$, $p < .001$). Accordingly, CSOs are less attached to their current company. Building on these two findings, one would expect that CSOs also change their jobs more frequently. However, as shown in model OLS-2, CSOs are less likely to change their jobs than other executives ($\beta = –.158$, $SE = .013$, $p < .001$).

To explain this result, firm size is examined next. As can be seen in model OLS-4, firm size positively predicts the employment of a CSO. While employees working in sustainability-related roles are generally more loyal (i.e., having a lower change rate), those who make it to the executive level may have no other choice than to change their firm, mainly because smaller firms often do not offer a CSO role (Peters et al., 2018).

Another explanation builds on the argument made by Strand (2013), explaining that the CSO is a relatively new position in the C-suite. Compared to traditional executive roles, such as operations or finance, sustainability executives have spent significantly less time in their current role (as indicated by the variable tenure, $\beta = -.150$, $SE = .018$, $p < .001$). Together with the significantly younger age found amongst CSOs ($\beta = -.128$, $SE = .000$, $p < .001$), this result demonstrates the relative novelty of the position.

Table 4.3: CSO versus other C-suite members.

	Models			
DV: CSO (= 0/1)	OLS-1	OLS-2	OLS-3	OLS-4
External hire	.333***	.304***	.303***	.303***
	(.010)	(.009)	(.009)	(.009)
Firm attachment (%)		–.115***	–.123***	–.112***
		(.013)	(.013)	(.013)
Change rate		–.158***	–.156***	–.156***
		(.013)	(.013)	(.013)
Tenure (in role)		–.150***	–.148***	–.150***
		(.018)	(.018)	(.018)
Age at becoming CxO		–.128***	–.100***	–.104***
		(.000)	(.000)	(.000)
Leadership			–.088***	–.087***
			(.005)	(.005)
Firm size			.026*	.026*
			(.003)	(.003)
Gender				.027**
				(.011)
Education				.035***
				(.004)
Languages				.006
				(.003)
Country FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Obs.	.111	.185	.190	.192
R-sq.	5526	5526	5526	5526

Note: All models include CSO as the main dependent variable. The dummy-coded variable takes a value of one if the individual holds the job title of a Chief Sustainability Officer and zero for all other members of the C-suite. Only current executives are included in the analysis. Before entering the main variables of interest, the models first enter country and industry fixed effects are entered. Each observation corresponds to a given executive(i). All regressions use OLS and standard errors are clustered at the country level. Significance noted as: p-value $< .10$ = *, p-value $< .05$ = **, p-value $< .01$ = ***.

Consequently, sustainability professionals have a higher chance of becoming an executive or sustainability officer early in their careers and potentially face less competition moving up the corporate ladder. However, this is not to say that CSOs have a better chance of joining the C-suite. As mentioned above, most firms have not yet appointed a CSO, lowering the number of open positions. Moreover, compared to other members of the C-suite, sustainability officers also show significantly lower leadership experience ($\beta = -.098$, $SE = .005$, $p < .001$, model 3). As outlined in the introduction, CSOs often have different responsibilities, and they likely serve as an expert or advisor placed horizontally in the organisational structure. In practice, sustainability units often follow a lean central structure with a mandate to incubate solutions and initiatives across different departments of the organisation (Hatami & Hilton-Segel, 2021). Serving in addition to core business operations thus lowers the demand for employing large teams. On the contrary, other executives such as the CEO typically have large parts of the organisation in their charge. Lastly, since CSOs are younger, have less leadership experience, and are more likely to be female, they potentially face greater degrees of stereotyping than other executives (Beeson & Valerio, 2012; Doan & Iskandar-Datta, 2021; Fitzsimmons et al., 2014).

In conclusion, the results show that sustainability officers differ from traditional executives in many ways. To better understand the differences amongst all leaders working on sustainable topics within organisations – not only the chief executives – the following subsection examines the tasks, responsibilities, and skills possessed by sustainability specialists.

4.4.2 Skills amongst CSOs

To better understand CSOs' competencies, this section identifies the most prominent skills exhibited by individuals working in a sustainability role. After splitting the sample, the skills were grouped and categorised into competency domains.

Subsequently, the skills were mapped onto a matrix examining hierarchy on one dimension and firm attachment on the other.

As indicated by Table 4.4, a broad range of skills was identified by the LDA. These skills can be grouped into five functional roles and nine competencies. Although these labels are arbitrary, these categories are intended to provide a comprehensible overview of the different types of sustainability experts.

The first results can be explained with the fact that a significant portion of the individuals included in the sample holds a chief executive title. The management role comprises about 10% of the total sample and includes typical managerial skills, such as leadership and profit and loss (P&L). However, it is also apparent that individuals in this role are associated with having expertise in a sector-specific area, in this case, CSR.

The second category is indicative for traditional mid-level corporate functions (marketing and purchasing). The skills exhibited are not directly linked to sustainability topics, but the results still indicate that sustainability is crucial in these two business units. Interestingly, purchasing skills are more dominant than marketing. This finding aligns with chapter 5, which illustrates that HR and marketing are interconnected with sustainability topics.

Technical roles are strongly defined by sector knowledge. Here, individuals portray a range of specific skills, such as being familiar with ISO standards or designing and engineering sustainable technologies. Furthermore, it is noticeable that the second largest skill group amongst sustainability employees is compliance related. This illustrates the importance of having a technical education or background when striving for a role in this domain.

Table 4.4: Skill categories.

Category	ID	Competency	Skill	Rate %	Total %
Management role	1	Management	CSR	6.00	10.77
			Board membership	1.59	
			Team leadership	1.59	
			P&L	1.59	
Functional role	2	Marketing	Social media	0.22	1.08
			Sales	0.22	
			Business development	0.22	
			Marketing	0.22	
			Campaign design	0.22	
	3	Purchasing	Supply chain management	4.92	14.10
			Procurement	3.33	
			Logistics	2.53	
			International trade	1.66	
			Multilingual	1.66	
Legal role	4	PR	Corporate communications	2.68	6.80
			Public relations	1.37	
			Press	1.37	
			Creative writing	1.37	
	5	Legislature	Governance	3.76	7.52
			Lobbying	1.88	
			Policymaking	1.88	
	6	Law	Legal advisory	6.80	19.74
			Global affairs	4.84	
			Acquisition	4.84	
			Environmental laws	3.25	
Technical role	7	Compliance	Crisis management	5.50	17.14
			Auditing	4.48	
			ISO 14001	2.10	
			Risk prevention	1.88	
			EHS	1.59	
			ISO 27001	1.59	
	8	Engineering	Manufacturing	3.25	12.15
			Renewable energies	3.25	
			Sustainable engineering	2.82	
			Product design	2.82	
Advisory role	9	Consulting	Strategy development	5.71	10.70
			Change management	3.33	
			Research	1.66	

The most dominant competency revolves around legal skills; circa 20% of employees state expertise in environmental law and other legal areas. Together with

PR and governmental affairs, this category appears to be a prominent domain amongst sustainability professionals, making legal experts particularly suitable for such roles. Tasks within this role mainly include interacting with external stakeholders, such as governmental bodies, customers, and the media.

Finally, several key skills can be categorised as research, auditing, and consulting related. This confirms the assumption that sustainability experts often serve as advisers to other departments.

Overall, these findings support the upper echelons theory, given that functionally diversified executives have a greater spectrum of skills, capabilities, and experiences at their disposal, which help them process information more effectively (Bantel & Jackson, 1989; Buyl et al., 2011; Diaz-Fernandez et al., 2015). The wide range of skills associated with the role of a CSO extends this theory and shows that, contrary to a traditional executive role such as CFO sustainability leaders face highly diverse responsibilities. As will be discussed below, this hints at different corporate structures whereby organisations either integrate sustainability experts into their existing business units such as marketing or purchasing or establish a team that is located parallel to existing departments and instead serve as a functional advisers with a mandate from the board (Hatami & Hilton-Segel, 2021).

To examine differences between CSOs with higher and lower firm attachment, the skills identified by the LDA are mapped onto a matrix showing the position on the corporate hierarchy on the y-axis and firm attachment as a continuous measure of how long the executive has spent in the company on the x-axis.

The difference between high and low firm attachment amongst C-suite members is examined first. Interestingly, while crisis management is the most dominant skill amongst loyal executives, risk prevention is located on the other side of the spectrum. Rodrigue et al. (2013) hypothesised that the creation of sustainability

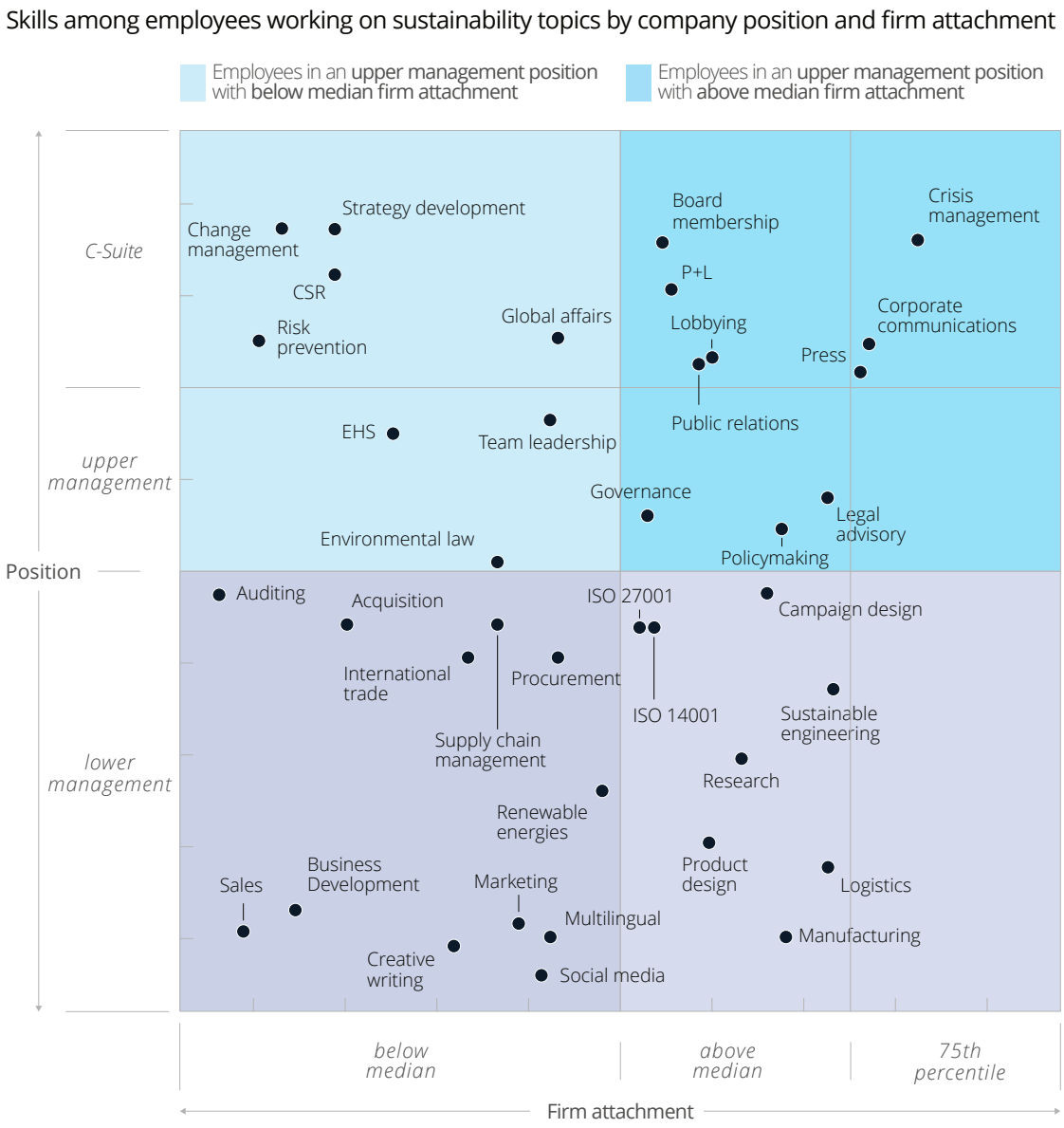

Figure 4.2: Skills matrix amongst sustainability employees.

committees is likely to be more effective at preventing reputational harm than reducing environmental harm. However, the present analysis provides a different perspective for this thesis. Since organisations hire CSOs to prevent risks *and* to deal with actual crises, it can be assumed that hiring decisions are made deliberately and that loyalty is taken into account, in addition to sheer technical expertise.

Additionally, PR-related skills (including corporate communications, press, and lobbying) are located in the upper right quadrant and are associated with higher firm attachment amongst high-ranking executives. In contrast, consulting-related skills (strategy development and change management) are more dominant in the upper left quadrant. Building on this, it can be concluded that not all executives are trusted with the same responsibilities. It can be inferred that loyal managers are entrusted with external communication tasks (i.e., being a representative or face of the company when it comes to sustainability), whereas new executives are more concerned with internal projects.

Besides the general availability within the organisation, hiring from outside of the organisation might depend on the corporate prospect and shareholder expectations. Specifically, companies who face increased scrutiny in public or expect significant regulation changes in the foreseeable future (such as traditional car companies who need to achieve a drastic transition into the EV sector) hire externally. Smaller companies or well-established organisations rather educate and promote their next CSO internally because they can better understand and exploit corporate structures, are a familiar face amongst team members, and potentially more trustworthy to the public than an external CSO.

Similarly, managers who exhibit strong consulting skills potentially benefit from low firm attachment as their effectiveness depends on gaining different perspectives, and, in simple terms, the term change management already implies a higher tendency to *change* the position rather than portraying attachment.

The distribution amongst the lower-management employees is scattered across the attachment scale. Generally, employees with more specific skills such as sustainable engineering or ISO 27001/14001 show higher firm attachment than those who indicate rather generic skills, such as sales, business development, or international trade. This

result potentially stems from the nature of the data itself. Since the purpose of entering the database as a candidate is to present oneself as a potential employee, those who have a lower attachment might present their skills more broadly as opposed to employees who have a lower intention to change jobs. This assumption can be corroborated by the negative correlation between firm attachment and job-seeking status ($r = -.064$, $p < .001$). Employees with a low firm attachment are more likely to indicate 'open to new positions' in their candidate profile.

When comparing auditing with other technical skills, technical employees generally show a higher firm attachment, whereas auditors have little to no attachment. This may be a result of their special function as an independent evaluator of corporate practices (Burton et al., 2012). Additionally, this may also imply that auditors are often employed as consultants or external employees, which in turn corroborates findings for other consulting skills with lower firm attachment in the upper management, such as strategy development. Employees in creative positions such as marketing, writing, and social media are generally ranked lowest on the cooperate ladder.

4.5 Discussion

Companies use various methods to adopt sustainability initiatives and improve corporate sustainability. One recent trend is to follow a strategic, top-down approach by assigning a chief executive of sustainability to the C-suite (Strand, 2013). In theory, appointing a CSO can bring several benefits to an organisation, from diversifying the board to increasing legitimacy when facing the public. However, actual studies on the outcomes of CSOs hires have found little to no relationship between appointing a CSO and environmental firm performance (e.g., Kanashiro & Rivera, 2019).

The novelty of this research domain and the ambiguity resulting from theoretical benefits and actual performance outcomes have started a debate on whether

organisations should hire a CSO. Building on several calls for more research on the subject (e.g., Kanashiro & Rivera, 2019; Strand, 2013; Wiengarten et al., 2017), this study aims to answer whether appointing a CSO is warranted. Analysing 10,007 individuals from 29 countries, this study finds that hiring a CSO is no longer a theoretical concept but rather an increasing trend amongst organisations. About ten per cent of organisations in this study have employed a CSO, highlighting the notion that chief executives with specialised roles are becoming more common (Kanashiro & Rivera, 2019).

To address the primary question, the present study builds on the upper echelons theory and examines the skills and career histories of CSOs. Results show that CSOs are often younger, are more likely to be female, and come from more diverse backgrounds than other C-suite members. Thus, appointing, for example, a young female CSO to the C-suite can signal diversity alongside environmental awareness. Moreover, since CSOs typically have less leadership experience and lower tenure compared to other C-suite members, results may imply that CSOs are hired symbolically rather than substantively (Rodrigue et al., 2014). Lastly, Peters et al. (2018) posit that CSOs are primarily associated with communicative tasks such as PR and marketing, which lowers their actual impact on driving change and convincing stakeholders of their legitimacy. Amongst the participants in this study, at least half of the skills portrayed by high-ranking sustainability managers are communicative in nature. Taken together, the present study finds some support for the argument that CSOs merely serve a ceremonial purpose.

It is important to note, however, that strong communication skills are not necessarily indicative of an illegitimate leader. Climate change communication is a value-driven process (Speckemeier & Tsivrikos, 2021). An effective environmental leader needs to use emotional messaging techniques and translate intangible and long-term processes to various stakeholders. Moreover, as representatives of the organisation,

chief executives are faced with the challenge of questioning established processes and transforming environmental practices across the entire organisation (Andersson & Bateman, 1997). Thus, results indicate that strong communication skills might actually enhance the effectiveness and legitimacy of CSOs.

Looking at the skills of CSOs, it becomes clear that they serve multiple roles within organisations and potentially show a broader range of responsibilities than traditional executive roles (such as COOs or CFOs). Thus, another way to address the ambiguity between technical and communicative CSOs is to consider two types of sustainability executives: Managers and leaders. Managers are rather technical and potentially serve as advisers to other departments, working on specific internal challenges or projects, and are more concerned with sector-specific tasks (see Figure 4.2, upper left quadrant). Managers are effective in their role because they can prioritise needs, address competing challenges, and bring different viewpoints together (Levy & Rothenberg, 2002). An executive with functional competency helps mid-level managers to process data and handle difficult requests (Hambrick & Mason, 1984; Menz, 2012; Nath & Mahajan, 2008). Leaders, on the other hand, are actively embedded in the organisation's leadership and have more diverse responsibilities, including policymaking, public communication, lobbying, and legal advisory (see Figure 4.2, upper right quadrant). As proposed by Strand (2013), sustainability is closely linked with corporate responsibility, and chief executives become the organisational symbol of responsible corporate practices when facing shareholders. While lower-level employees in this study's sample primarily exhibit specific technical skills, executives are trusted with diverse tasks, including corporate communication and change management. While CSOs are indeed often associated with PR, a conclusion that CSOs *only* serve a symbolic purpose is not justified.

Lastly, most CSOs are hired from outside of a company. If symbolism was the primary purpose of CSO appointments, promoting a manager from inside the

organisation would likely cause less controversy due to familiarity with the organisation, existing relationships, and available performance track records. However, given the complexity of skills required to become a CSO and the responsibilities that practising chief executives undertake, hiring decisions are likely based on an organisation's specific demands. In a similar vein, the distinction between internal advisers and consultants working on preventive tasks (typically found amongst new hires) and public-facing CSOs (typically found amongst loyal executives) further supports the premeditation of CSO hires. Combining career histories with skill sets thus highlights the nuances associated with the role and, thereby, yields strong evidence that CSO appointments are made deliberately and that the objective of hiring a CSO goes beyond serving a symbolic purpose.

In conclusion, the results provide strong evidence that the hiring decision of CSOs is made deliberately and that the individuals serving in this role serve a dedicated and warranted purpose. Contrary to the thesis put forward by Peters et al. (2018) and Maniora (2018), which postulates that CSOs are merely symbolic representatives appointed to reassure the stakeholders on environmental efforts, the diversity of skills needed and tasks associated with CSOs as well as the tendency to look outside of a company to hire one, strongly suggest that ceremonial conformity may rather be an added benefit to the actual objectives of CSO appointments, namely crisis management, risk prevention, public affairs, and technical leadership. Ultimately, the results support that CSO appointments are warranted and highlight the theoretical and practical benefits of appointing a CSO to the top-management team.

4.5.1 Theoretical implications

This research contributes to corporate social and environmental research as well as upper echelons theory. Despite existing research on the impact that the board (Al-Shaer & Zaman, 2016; Naciti, 2019) and traditional C-suite executives

(Hespenheide et al., 2010; Profitlich et al., 2021) have on corporate sustainability, the role of CSOs has yet to be examined thoroughly. This study puts the upper echelons theory to the test in a comparably new role in senior management: CSOs.

According to the theory, the personal traits of C-suite members are thought to influence strategic decisions and legitimacy. Moreover, executive teams differ in how they are structurally organised (Hambrick et al., 2015; Nuscheler et al., 2019), and the functional composition of the C-suite influences a firm's ability to cope with public scrutiny and trade-offs between social, environmental, and financial objectives (i.e., triple bottom line). The present study supports these notions and argues that the specific constitution of the C-suite matters – that is, the skills represented in different functions should complement each other. This study therefore underlines the demand to reconsider the circumstances of these selections and the skills and qualifications of those promoted to the executive team. Results are in line with earlier findings that indicate that upper-echelon qualities are critical in distinguishing different members of the C-suite (Manner, 2010). The results further add to research on environmental leadership, highlighting that the skills needed to excel in this role are multi-faceted and more complex than generally assumed (Chavez et al., 2001; Zerbini, 2017). Consequently, this research provides an opportunity to investigate how upper echelons theory might be used to broaden the understanding of corporations' ethical behaviours. The result also potentially extends signalling theory (Spence, 1978), which was the focus of the study outlined in Chapter 2.

While previous studies have already tried to examine the advantages of employing a CSO, one major limitation outlined by Wiengarten et al. (2017) and Strand (2013) is that most studies do not take longitudinal effects into account. Most studies only examine the early stages of companies appointing CSR representatives, which may distort the outcome of their effectiveness as new hires or newly presented initiatives in the sustainability domain are most effective early on but often diminish

over time (Van der Linden, 2015). Prior studies have not taken into account for how long the executive stayed in the role, whether the person has previous experience as a CSO, or whether she or he moved up the internal corporate ladder or was hired externally. Investigating these nuances becomes particularly important for sustainability topics as sustainability initiatives and environmental progress are typically long-term processes. This study considers a wide range of hiring decisions, career data, and mostly used continuous rather than dichotomous variables, thus taking experience and time spent in the position into account, to address these limitations.

Finally, the chapter is related to the literature that studies general leadership traits examining management skills, leadership styles, and diversity, including gender and age effects (Kaplan & Sorensen, 2017; Malmendier & Tate, 2005, 2009).

4.5.2 Practical implications

One critical question that is often raised in the discussion on CSOs is the link between CSO appointment and company performance (either sustainability, such as carbon footprint, or financial, such as company valuation). To date, studies have not provided conclusive evidence. Paradoxically, one group of studies indicates that CSO appointments have no or only a very limited impact on performance (Henry et al., 2018; Peters et al., 2018). Others, including Strand (2013), found a positive relationship between executive appointees and Dow Jones Sustainability Index rankings.

The current research provides a potential answer to this debate. Given that CSO appointments are a relatively novel corporate practice (Peters et al., 2018), simply adding a sustainability officer to the board may not suffice to achieving a long-term outcome. The broad range of responsibilities associated with the role of a sustainability expert within an organisation highlights the diversity of subjects and challenges an organisation faces. This is underlined by the results shown in the skill matrix, wherein

the responsibilities associated with sustainability topics range from marketing over engineering to public policy.

Employing a CSO accompanied by several sector-specific experts or mid-level managers would be a good strategy to consider. To address the argument put forward by Afsar et al. (2018), explaining that CSOs merely serve as symbolic appointees, the results in this study demonstrate that having an executive without the necessary support structure has the potential to become a self-fulfilling prophecy (see also Boiral & Roy, 2007; Yin & Schmeidler, 2009). Integrating a comprehensive sustainability structure consisting of experts and leadership serves another purpose. Having no CSO in the leadership can cause a severe conflict of interest between core departments (operations or finance) and mid-level sustainability specialists. Since environmental initiatives are often intangible and costly (Eltayeb et al., 2011; Studer et al., 2006), conventional chief executives without the necessary environmental background may favour traditional approaches over green initiatives (e.g., a COO who needs to weigh environmental and efficiency objectives in the production). Lastly, other mid-level managers and non-leadership employees are more likely to identify and empathise with a more heterogeneous leadership and, as a result, are more likely to embrace strategy adjustments and action plans offered by a diverse C-suite. Analysing skills vertically across the corporate hierarchy highlights the importance of a holistic focus on corporate environmental subjects. It can be concluded that organisations should not only rely on appointing a top executive but build the support structure and technical expertise necessary to turn vision into action.

In addition to these direct implications, the results provide further contributions to a wide range of domains, including PR, finance, education, and public policy. The following part outlines some of these implications.

Public relations. The wide range of skills presented in the skill matrix illustrates that a CSO is unlikely to be an expert in all categories. The hiring decision should be made deliberately and based on the existing board's constitutions and skills. For instance, companies with a strong PR department and a CEO with a vivid public face can release the position of the CSO and allow her or him to focus on other areas. Conversely, as indicated in the skill matrix, CSOs should not solely be considered public speakers for the company. In a well-oiled team, the CEO and CSO can complement each other and serve as dual leadership in PR. The finding further corroborates that managers with a high firm attachment (i.e., loyalty) often display strong external communication and legal skills, whereas new employees mainly work on consulting, advisory, auditing, and risk prevention tasks.

Finance. The findings of this study further provide implications for financial strategy and investor relations. Before investing, experienced investors usually do not depend on third-party sustainability data; they spend time investigating company-specific sustainability performance, including management credibility and expertise (Ailman et al., 2017). The credibility of CSOs and their potential to convey sustainability concerns are most likely enhanced by their skills and experiences with sustainability projects (Peters et al., 2018). Leading economists and investors have expressed concern about senior management's lack of environmental expertise and attention in publicly-traded companies (Ailman et al., 2017; O'Neill, 2016; Strott & Carey, 2016). For example, Larry Fink, the CEO of BlackRock, recently urged public-company CEOs to engage with social issues and move financial priorities from short to long term (Morrell, 2018). He spoke on how the financial sector continues to pressure companies to acknowledge how environmental and social challenges may influence their profitability and outlined several firm-specific environmental actions to shareholders.

Education. With the increase in integrating sustainability subjects into management and executive education programs (Wright & Bennett, 2011), the importance of understanding what skills are relevant at which stage of the career and which skills should be focused on for which level of employees opens up new avenues for learning about the consequences of knowledge-based management roles, and, thereby, helps educators to refine their curriculum.

Policy. Given the increasing integration of business and politics (Okereke et al., 2012), the results of this study are not only limited to corporations and can equally be extended to governmental bodies. Committing significant resources, e.g., by assigning a key executive as a dedicated sustainability officer, indicates genuine concern for environmental issues (Strand, 2013). In a similar vein, consulting firms and governmental organisations, such as the Sustainability Accounting Standards Board (SASB), are working to create an equal solution to the unbalanced connection between management and external stakeholders when it comes to environmental data in an attempt to guide organisations on a transition towards a better CSR performance (Peters et al., 2018).

4.5.3 Limitations and future research

While the skill matrix paints a diverse picture, it is important to note that companies displayed here are most likely larger corporations with the size and resources to build diverse teams. Sustainability managers in smaller organisations are expected to exhibit a broader range of skills. Future studies may examine small or medium-sized companies specifically.

Methodologically, it is important to acknowledge the potential limitations and areas for improvement of the LDA analysis. One significant challenge in employing LDA is selecting the optimal number of topics (K). An inappropriate value for K may lead to either overly broad or overly specific topics, affecting the interpretability and

usefulness of the results. However, the number was limited due to the entries in the candidate database and the skills indicated by individuals. Refining the method for choosing K through techniques like model selection, cross-validation, or employing advanced topic modelling methods that infer the number of topics automatically could improve the outcomes for future studies aiming to employ this method.

Another potential limitation is the assumption of topic independence in LDA, which may not always hold true for real-world data. In practice, topics can be related or hierarchical, and capturing these relationships could offer additional insights. To address this issue, future studies could explore extensions or alternative models, such as the Correlated Topic Model (CTM) or Hierarchical Dirichlet Process (HDP), which can account for topic dependencies. Moreover, incorporating additional information or domain knowledge, such as metadata or expert-derived labels, could enhance the model's performance and interpretability.

Moreover, missing performance data precludes this study from drawing inferences on the actual impact of the CSO appointment, hence limiting the comparability to performance-based studies (e.g., Kanashiro & Rivera, 2019; Wiengarten et al., 2017). To address this limitation, future studies may consider a subset of the sample and match CSO appointments with financial or environmental performance data. Specifically, it would be worthwhile to examine how firm attachment and the associated tasks (e.g., risk prevention versus crisis management) impact performance. Lastly, CSOs have been defined as C-suite members dedicated to environmental or sustainability-related topics. However, given the diversity of this role, some executives may also be associated with health and safety (i.e., EHS manager) or other CSR-related responsibilities. An interesting avenue to pursue would be to examine the nuances associated with CSOs and potentially shed light on the differences between environmental leaders and CSR managers in general.

4.6 Conclusion

In the 1960s, virtually no company in the US has appointed a CFO to their C-suite (Zorn, 2004). In the early 2000s, all Fortune 500 organisations employed a CFO. Ongoing climate change and increasing pressure from customers, employees, and society as a whole have since led companies to increase environmental awareness and modify their top-management structures to be more sustainability focused. The analysis of 10,007 executives and environmental leaders across 29 countries shows that ten per cent of companies already consider a CSO essential to their leadership. With eyes on the UN 2030 agenda for sustainable development (Tsalis et al., 2020) and the necessary transition towards a greener society, the findings presented in this study offer some hope that companies are taking action and that CSO appointments are not simply done to signal conformity but are rather made deliberately and include a wide range of distinctive responsibilities. Understanding the career histories of CSOs and the skill sets needed to excel in their position illustrates the complexity of diverse leadership teams and hopefully encourages researchers and practitioners to acknowledge the importance of this role and stimulate further investigations into the predictors and outcomes of effective, sustainable leadership.

5 | Greenwashing and employer branding

5.1 Overview

In the era of the "war for talent" (Michaels et al., 2001), both organisational leaders and scholars emphasise that job seekers are more likely to reject companies with a negative image (Klimkiewicz & Oltra, 2017). Montgomery et al. (2003), for example, found that an organisation's green reputation is critical for attracting MBA graduates. With the consistent risk of facing negative information and increased stakeholder scrutiny, maintaining a stable employer brand therefore becomes an important aspect to many organisations. As a result, companies are increasingly trying to portray themselves as a sustainable employer to stay competitive and attract greater numbers of candidates (Bin Magbool et al., 2016; Jones et al., 2010; Story et al., 2016). The increased use of green marketing strategies may, however, also incline some organisations to disingenuously present themselves as a green employer. Deceptive green marketing is often referred to as 'greenwashing', a term that originates from consumer research and is a frequently cited concern of policymakers (Manrai et al., 1997; Terra Choice, 2010).

Even though greenwashing is a common research topic, most studies examine purchasing decisions (Bhattacharjee et al., 2014). Thus, the degree to which greenwashing affects long-term decisions such as choice of employer remains understudied. Job choices represent a distinct type of decisions that are vastly different from day-to-day consumer choices as they often involve multiple steps, cannot be bought, and have more far-reaching consequences. It is therefore of great interest to shed light on the interacting effects of marketing, perceived brand image, and environmental identity on job intentions. In fact, there is a present call for more research to identify and catalogue the varieties of green employer branding and measure its impacts on organisational perceptions and recruitment success (Lyon & Montgomery, 2015).

Accordingly, this research explores the effects of greenwashing on employer branding and job pursuits. Through the lens of signalling theory, this chapter specifically examines the interaction of deceptive green marketing and perceived green organisation image, aiming to highlight the conditions under which job seekers disregard the authenticity of job advertisements. Across four field experiments, using a total of 941 actual job seekers, results reveal that genuine green marketing leads to the highest attraction scores. However, when the perceived green identity of a company is low, green marketing can lead to an even lower number of applications than no green marketing. Thus, green marketing does not increase job attraction per se. It is rather a function of identity and ad campaign design. Results also show that amongst participants with high environmental attitudes, the negative effects of greenwashing are amplified, resulting in even lower job-pursuit intentions. On the contrary, job seekers with high P–O fit appear to be unaffected by deceptive marketing. This study is amongst the first to incorporate the notion of inauthentic green employer branding in job advertising and, in doing so, provides a new theoretical viewpoint of how perceptions of employers are built and modified. The results aim to show to employers that providing misleading information harms job attraction and provide insights on how to reduce greenwashing practices in the recruitment domain.

5.2 Literature review

5.2.1 Perceived green image on talent attraction

When searching for a new position, job seekers build impressions of prospective organisations based on incomplete information that they learn throughout the application process (Nyilasy et al., 2014; Rynes & Miller, 1983). According to signalling theory, organisations convey information about their working conditions, ethics, and conventions and job searchers use these cues to evaluate whether their standards of possible employers are met with the organisational offer (Turban & Greening, 1997). Notably, research indicates that job-related attitudes and beliefs are impacted by more than just job tasks and organisational features like salary and location (Chapman et al., 2005) but also intangible factors such as employee well-being, wealth, and green reputation (Behrend et al., 2009; Lievens & Highhouse, 2003). Job seekers thus interpret a wide range of signals as predictors of future employment relations (Wanous et al., 1992). Corporate identity, also referred to as employer brand or image therefore plays a crucial role in complex job search situations where it is difficult to distinguish between similar job descriptions (Garavan et al., 2012; Mudambi et al., 1997; Rampl & Kenning, 2014). It is described as a job seeker's mental picture of an employer brand and contains symbolic implications that refer to the specific characteristics of the brand (Chen, 2010; Ryu et al., 2012). In addition, green corporate identity entails a set of perceptions about the sustainability efforts reflected by a company's environmental performance (Nyilasy et al., 2014).

Over the last two decades, researchers have increasingly examined green reputation and corporate identity to determine successful CSR practices. A number of studies found that environmental performance scores were strongly linked to reputation scores (Backhaus et al., 2002; Brammer & Pavelin, 2006; Cho et al., 2012; Jones et al., 2014; Tsai et al., 2014). Additionally, the green reputation exposed to individuals can

significantly impact subsequent purchasing decisions and pro-environmental behaviours (Chen, 2008; Dowling, 1986). In the recruitment domain, researchers found that job seekers are more likely to apply for positions with companies that they consider environmentally responsible as opposed to firms with a poor perceived green identity (Alniacik et al., 2012; Tsai et al., 2014). Importantly, a high perceived green image increases not only employer attractiveness but also actual application numbers and hires (Bin Magbool et al., 2016; Jones et al., 2010; Story et al., 2016).

Linking this to signalling theory, candidates who are looking for a new position attempt to match the job offer with their aspiration of a suitable prospective employer (Wanous et al., 1992). In return, job seekers may assume that employers who claim to protect the environment might also take good care of their employees. Green reputation therefore signals important job attributes (Cable & Turban, 2003). The first hypothesis builds on the idea that employers have an inherent green identity that is perceived either positively or negatively by potential employees. For instance, younger generations consider working for a sustainable clothing company as more attractive than working for an oil company, simply due to an industry stigma (Klimkiewicz & Oltra, 2017). Building on this, it is expected that:

Hypothesis 1 (H1): *Companies with a high perceived green identity attract a greater number of job seekers than companies with a low perceived green identity.*

Perceived corporate identity has a particular importance for this research as it represents the current mental picture a candidate makes of a prospective employer (Balmer & Greyser, 2009). However, Fukukawa et al. (2007) note that to successfully attract talent, firm identity ('what we really are') is supposed to be aliened with messages ('what we say we are'). Talent attraction thus depends on the nexus between the perceived image and corporate communication (Gray & Balmer, 1998). Accordingly,

when studying the effect of perceived company identity on job-pursuit intention, it is crucial to investigate *how* employers communicate about environmental subjects.

5.2.2 The benefits of green human resources marketing

In recent years, spending on sustainable marketing and social campaigns has increased substantially (Forbes, 2012; Nyilasy et al., 2014). To this end, many companies apply pro-environmental marketing methods hoping to build the impression of an environmentally-conscious brand, which in turn would lead to more favourable employer image and attract a greater number of candidates. This strategy can be beneficial since corporate marketing is frequently found to contribute to building a better organisational appearance and candidate opinion (Gray & Balmer, 1998; Hoeffler & Keller, 2002). In fact, even relatively little information about a company's social performance can have a positive impact on a company's reputation (Behrend et al., 2009), and actively promoting sustainable practices has been found to attract more talent (Boudreau & Rynes, 1985; Van der Wal et al., 2008). Green corporate communication therefore plays a vital role in creating a pro-environmental employer brand (Balmer et al., 2007; Fukukawa et al., 2007). Accordingly, it is proposed that:

Hypothesis 2 (H2): *Companies using active green marketing attract a greater number of job seekers than companies without green marketing.*

5.2.3 The dilemma of green human resources marketing

While green advertising can increase the perceived employer brand, not all companies are rewarded for communicating environmental practices. Organisations that claim to be environmentally conscious are typically subjected to higher scrutiny from governments, competing organisations, consumers, and, potentially, job seekers (Easterling et al., 1996; Nyilasy et al., 2014). The inflation of green messages makes it more difficult for job seekers to assess the integrity of marketing messages or, in other

words, to distinguish between reputation and rhetoric (Bernstein, 2009; Fukukawa et al., 2007). Furthermore, this situation could lead to a prisoner's dilemma whereby the benefits of falsely promoting green practices are higher than the payoff for being honest, yet all organisations receive a lower payoff if all companies lie rather than being honest (Parguel et al., 2011). As a result, even truly responsible companies often question the potential benefits of green marketing and may even refrain from promoting green practices all together. As espoused by Kotler (2011) and Willness and Jones (2013), further research is needed to help us better understand the benefits and potentially adverse effects of green recruiting marketing and employer branding campaigns.

5.2.4 Disingenuous green marketing: Greenwashing

In the last decade, greenwashing has become an increasingly important topic in psychology research due to its growing commercial use and its considerable ethical harm (Davis, 1992; Lyon & Montgomery, 2015). In recognising greenwashing as a deceiving communication technique regarding environmental topics, many studies have tried to determine how and why companies engage in greenwashing (see e.g., Chen & Chang, 2013; De Vries et al., 2015; Du, 2015; Testa et al., 2018). To date, the greenwashing literature provides much qualitative and anecdotal evidence that firms often "do not do what they say" (Alves, 2009; Furlow, 2010). According to Walker and Wan (2012), organisations aim to communicate or signal their green values to stakeholders by engaging in symbolic actions or "green talk" (Connelly et al., 2011). As a result, researchers suggest investigating the origin of greenwashing based on an expected interaction between advertising and actual environmental performance (Alves, 2009; Chen et al., 2020; Delmas & Burbano, 2011; Furlow, 2010; Paladino & Pandit, 2012; Ramus & Montiel, 2005; Terra Choice, 2010). As will be demonstrated, job attraction is a function of advertising and perceived company image. Consequently,

greenwashing is defined as candidates' reactions to situations where green advertising messaging and perceived green identity interact.

In the current literature, there is still controversy as to whether individuals succumb to deceptive marketing techniques or effectively detect misleading information. While Horiuchi et al. (2009) argue that individuals often have difficulties determining the trustworthiness of green initiatives, the majority of greenwashing literature states that individuals can successfully detect disingenuous advertising claims. Most empirical studies indicate a strong negative impact of a company's alleged irresponsible acts on attitudes towards the firm (Folkes & Kamins, 1999; Murray & Vogel, 1997). With young professionals and policymakers becoming more discerning and sceptical about the integrity of corporations, green advertising may become more of a liability than a benefit, especially when firms underperform environmentally (Du et al., 2010; Easterling et al., 1996; Pomering & Johnson, 2009). As a result, organisations may be more inclined to refrain from using green marketing techniques.

This research aims to provide a more nuanced view to this contradiction. It is proposed that while job seekers may react in a sceptical way to discrepancies between talk and action, genuine marketing can benefit from the aforementioned increase in perceived employer attractiveness and application numbers (Bin Magbool et al., 2016; Jones et al., 2010; Story et al., 2016). Accordingly, when companies are genuinely pro-environmental, it is predicted that marketing will attract more talent due to combined benefits of identity and advertising. In other words, the impact of green advertising depends on whether the claim is considered genuine and fits into the candidate's view of the organisation. Thus, it is argued that green advertising in general is not a universally bad strategy, and genuine green image positively influences job seekers' attitudes towards an organisation and job-pursuit intentions.

Hypothesis 3 (H3): *Perceived corporate identity and green marketing interact such that job-pursuit intentions are higher when the perceived corporate identity is high and lower when identity is low.*

This is not to say that companies should generally employ green marketing strategies to attract candidates. However, when a company with a low green identity intentionally advertises its contributions to the environment and, to a degree, presents misleading information (such as Exxon Mobil in 2012, Plec & Pettenger, 2012), green marketing can have adverse effects on talent attraction. It should therefore be considered as an interaction of corporate green identity and marketing practices.

In summation, green marketing is expected to have both positive and negative effects on job-pursuit intentions. Studying these could help organisations to conquer their fear of using green marketing and help policymakers and managers to make more educated branding decisions. Moreover, while the negative effects of disingenuous green marketing are unambiguous and often cited, few studies examine the positive effects of environmental performance communication (Brown & Dacin, 1997; Mohr & Webb, 2005). Lastly, the majority of greenwashing literature is consumer focused, which limits the number of studies investigating this interaction in the realm of recruiting.

5.2.5 Factors that enhance or reduce the effect of greenwashing

Despite its often-cited negative consequences, it is striking that many companies are still engaging in greenwashing (Delmas & Burbano, 2011; Shahrin et al., 2017; Wu et al., 2020). Consequently, it was of interest to examine additional drivers of greenwashing to potentially identify factors that enhance or reduce its effect. Previous research has identified various drivers of greenwashing, including political, organisational, economical, and ethical factors (for an overview, see Delmas & Burbano, 2011). For instance, while the lack of political regulations such as sanctions and financial pressure to stay competitive incentivise greenwashing, pressure from employees and

NGOs may decrease the use of misleading information (Torelli et al., 2020; Yu et al., 2020).

Drawing from consumer research, it can be inferred that some people are more prone to falling for greenwashing, for instance, consumers with low environmental attitudes (Chen & Chang, 2013; Delmas & Burbano, 2011). On the contrary, environmentally-conscious consumers indicate that they are willing to change brands solely based on a lack of conformity with their environmental values (Gan et al., 2008). This is further supported by Snyder and DeBono (1985), who found that people with strong environmental identities place greater emphasis on the green image portrayed than in the quality of the advertised product. Lastly, research indicates that ecologically-conscious consumers tend to show more scepticism towards advertising claims (Shrum et al., 1995). All of the above indicate that the effect is not consistent across all individuals.

Applying this to the recruitment domain, it is likely that the perception of greenwashing depends on the candidate's environmental attitude. This notion extends the previous hypotheses that propose that job seekers are generally able to detect inauthentic job advertisements and that this detection leads to lower employer attraction and job-pursuit intentions. It is expected that people with a high environmental attitude (a) place an even higher value on sustainable practices (Belk, 1988; Christopher et al., 2005) and (b) that job seekers' positive environmental beliefs make them more sceptical towards organisational claims, which in turn improves their ability to identify deceptive marketing content (Szabo & Webster, 2020). Thus, it can be hypothesised that:

Hypothesis 4 (H4): *There is a three-way interaction between perceived company identity, marketing, and environmental attitude.*

The aforementioned results make a strong case for a significant relationship between attitude and job-pursuit intentions. However, it is important to note that results are somewhat contradictory. Follows and Jobber (2000), for instance, found no value congruence between environmental stance and organisations advertising green products. In their study, the positive environmental impacts of sustainable products were outweighed by the individual purchasing preferences, such as convenience, accessibility, scarcity, and product quality. Accordingly, it is assumed that environmental attitude is not the only factor impacting job-pursuit intentions. Prospective applicants interpret the characteristics of the organisation based on a range of individual expectations and values (Cable & Judge, 1994, 1996). This range is often summarised under the umbrella term of 'person–organisation fit'. In simple terms, candidates are particularly attracted to employers that are aligned with their values. Previous research supports the relation between organisational fit and job choices (Behrend et al., 2009; Turban & Greening, 1997), and a meta analysis by Chapman and colleagues (2005) determined P–O fit as a key predictor of career decisions.

As a result, the values impacting job-pursuit intentions potentially go beyond sustainability aspects, making job seekers' organisational fit an assessment of individual values and expectations of employer characteristics (Chapman et al., 2005; Kristof, 1996). Building on this idea, a three-way interaction between identity, marketing, and P–O fit is expected whereby participants with a low organisation fit assess the authenticity of the job descriptions more critically and, as a result, detect misleading or disingenuous information correctly. However, job seekers with a high P–O fit may be less affected by the presentation of disingenuous information as their intention to work in a respective field outweighs trustworthiness. Accordingly, it is proposed that participants show greater approval of job ads – even when being dishonest – as long as their P–O fit is high enough.

Hypothesis 5 (H5): *There is a three-way interaction between perceived company identity, marketing, and P–O fit.*

5.2.6 Overview of the present research

Four large-scale experiments were conducted to examine whether the perceived green identity of a company affects employer attractiveness and job-pursuit intentions. Across all studies, samples of actual job seekers were used. Studies 1 and 2 investigate the most straightforward prediction that companies with a higher perceived green identity attract a higher number of applications (H1). The treatments varied in order to generalise the findings, increase external validity, and potentially shed light on the differences between industries and company types. Study 3 examines the main hypothesis that green advertising and perceived green identity interact to impact job attraction. This research aims to show that green marketing can have both positive and negative effects, depending on the company's perceived green identity (H3). Finally, study 4 extends previous findings by determining under what conditions green marketing is more or less effective. Specifically, building on the idea that job decisions are made under a number of influencing factors (Athanasou, 2003; Highhouse et al., 2007), such as predispositions towards a prospective employer (Dineen et al., 2002; Zhang & Gowan, 2012), this research further tested for a three-way interaction by introducing the additional variables of environmental attitude (H4) and P–O fit (H5).

5.3 Study 1: Preferences in job intention by green company identity

The objective of the first study was to compare two companies with distinct green identities (sustainable clothing company versus oil company) in order to examine

differences in the perceived green identity and job-pursuit intention. Due to general preferences of green over non-green employers (Bin Magbool et al., 2016; Jones et al., 2010; Story et al., 2016), it was expected that the sustainable clothing company attracts more job seekers than the oil company.

5.3.1 Procedure

One thousand eight hundred and sixty members of an international talent pool of a large Chinese HR company were invited by e-mail to participate in the study on a voluntary basis. After completing the consent form, participants were randomly assigned to one of two advertising conditions (high and low green identity) for a between-subjects experiment. The first question asked the participants to what degree they are open for new positions on a five-point scale; only participants indicating a three or higher were included in the experiment. Subsequently, participants were presented with descriptions of organisations (the treatments). Participants were aware that the job ad was not real, but the advertisements were closely modelled after actual ads posted on known job boards and approved by managers at the HR company for credibility, accuracy, and appropriateness prior to their use (Weske et al., 2019). After reading the ad, participants were asked to answer a post-experiment questionnaire including questions about the perceived green identity of the organisation (the treatment check) and their attraction to the organisation (DV).

5.3.2 Material

The treatments shared a 'common core' based on the common core values found by Van der Wal et al. (2008) that contained fictional descriptions of organisations (such as providing a wide range of products and services) and information about what the organisation offers (including flexible work hours and a competitive salary). The manipulation was achieved by using different versions of the company descriptions.

Moreover, the visual design of all organisation descriptions was kept to a minimum and was the same for all groups. The DVs were the perceived green identity of the employer and job-pursuit intentions. Unless otherwise noted, all measures used a seven-point scale ranging from 1 = 'strongly disagree' to 7 = 'strongly agree'.

Perceived green identity. Company green identity was assessed with seven items adapted from Chen (2008). Two sample items are 'The reputation of this company about environmental management is stable' and "This company is well-established about environmental management". The mean reliability coefficient was α = .86.

Job-pursuit intention. Job-pursuit intention was measured with 11 items adapted from Highhouse et al. (2003). Sample items are 'If I was invited to interview for this job, I would go' and 'I would exert a great deal of effort to work for this company'. The mean reliability of this scale was α = .88.

5.3.3 Results and discussion

A total of 77 candidates (M_{age} = 32.17 years, SD_{age} = 5.54; 45% female) participated in the study. The oil company received significantly lower green identity scores (M = 3.21, SD = .66) than the sustainable clothing company (M = 4.98, SD = .57), $t(76)$ = -12.650, $p < .001$, r = .82. This indicates that the manipulation of green identity was effective. The first main hypothesis predicted that participants are less likely to apply for a job at a company with a low green identity. An ANOVA on the DV yielded a main effect of company identity on job-pursuit intention, $F(1, 76)$ = 142.796, $p < .001$, η^2 = .914. Participants presented with a company with a high green identity indicated significantly higher job-pursuit intentions (M = 5.76, SD = .79) than those in the non-green company condition (M = 2.26, SD = .85).

The above analysis confirmed the prediction that companies with high perceived green identity attract higher numbers of job seekers than companies with a low green identity. These results correspond with current literature on corporate sustainability and applicant attraction (Bin Magbool et al., 2016; Jones et al., 2010; Story et al., 2016), demonstrating that perceived company identity is an important factor in talent attraction. In addition, results show that the treatments successfully manipulated the participants recognition and appraisal of the companies' green identity.

5.4 Study 2: Perceived green identity across different industries

Study 1 provided initial evidence that job-pursuit intentions are dependent on the green identity of an organisation. Studies 3 and 4 experimentally assess the relationship of perceived identity and green marketing. Before doing so, however, the findings are sought to be replicated using different scenarios. This allows to interpret results on a wider scale of company types and ensure that the identity appraisals that emerged were not based on idiosyncratic characteristics of the two particular company preferences selected in study 1.

5.4.1 Procedure and material

A total of six different industries have been selected (namely retail, finance, travel, natural resources, automotive, and architecture), each of which includes a green and non-green condition. The selection was based on the United Nations Environment Program's list of green industries (Schulte et al., 2010) and the classification of green jobs was taken from the US Bureau of Labour Statistics (Sommers, 2013).

Participants ($N = 156$, $M_{\text{age}} = 28.58$ years, $SD_{\text{age}} = 4.21$; 51% female) could choose up to three desired industries and were randomly assigned to either a green

Table 5.1: Descriptive statistics on job-pursuit intentions and perceived green identity.

			Perceived green identity				Job intentions			
	N	%	Mean	SD	t-value	p-value	Mean	SD	t-value	p-value
Retail	26	16.7								
Discount fashion	11	7.1	3.46	1.02			3.74	0.66		
Sustainable fashion	15	9.6	4.91	.72	-4.266	.000	4.24	.71	-1.827	.080
Finance	22	14.1								
Non-green hedge fund	7	4.5	4.06	1.24			4.06	.39		
Green hedge fund	15	9.6	4.71	.70	-1.573	.131	5.09	.24	-.074	.942
Travel	27	17.3								
Low-cost airline	16	10.3	3.62	.84			3.66	.81		
Eco-friendly travel	11	7.1	4.85	.95	-3.563	.002	4.08	.99	-1.208	.238
Natural resources	33	21.2								
Oil	18	11.5	3.44	1.11			3.78	.93		
Wind energy	15	9.6	4.82	.50	-4.443	.000	4.33	.91	-1.721	.095
Automotive	26	16.7								
Classic car manufacturer	15	9.6	3.74	1.03			4.04	.86		
Electric car manufacturer	11	7.1	4.35	1.04	-1.493	.149	4.74	.45	-2.447	.022
Architecture	22	14.1								
Luxury building designer	13	8.3	3.63	1.11			4.28	.92		
Green building designer	9	5.8	4.76	.85	-2.570	.018	4.03	.90	.627	.538

or non-green condition. Based on these two conditions, 12 job descriptions were created for treatment. The green companies included a sustainable fashion retailer (10%), eco-friendly travel agency (10%), green hedge fund (7%), wind energy company (10%), electric car manufacturer (7%), and green building designer (8%); the non-green companies were a discount fashion retailer (10%), low-cost airline (10%), non-green hedge fund (7%), oil company (10%), classic car manufacturer (7%), and luxury building designer (8%).

5.4.2 Results and discussion

For the six conditions combined, the perceived green identity for non-green companies ($M = 3.62$, $SD = 1.03$) was significantly lower than for green companies ($M = 4.74$, $SD = .78$), resulting in $F(154, 1) = 59.531$, $p > .001$, $\eta^2 = .272$. Using independent t-tests, results show that four out of six industries reveal significant differences (see Table 5.1). The two conditions with insignificant results were companies in the finance and automotive industries. A potential explanation for this result may lie

in the conflicting views on their environmental impact. For instance, while electric car manufacturers can have a particularly strong green identity (such as Tesla, Mangram, 2012), most automotive companies are now offering electric cars, making the gap between the two conditions fairly small. Moreover, the production and installation of batteries can be considered harmful for the environment (Larcher & Tarascon, 2015), leading to a blurred green identity and an unsuccessful manipulation. As for the finance condition, investment companies often switch their portfolio (Patton & Ramadorai, 2013), which might conflict with a consistent green identity. For studies 3 and 4, only those conditions with highly significant differences ($p < .001$) were used. Job intentions also differed significantly between low and high identity companies ($M = 3.90$, $SD = .87$ vs. $M = 4.25$, $SD = .84$, respectively), resulting in $F(154, 1) = 6.466$, $p < .01$, $\eta^2 = .040$. This indicates that green companies are generally considered to be a more attractive employer across industries.

The main purpose of the second study was to replicate the results and evaluate whether the revealed main effect occurs across industries. The findings provide evidence that the scenarios were effective in creating variance in the green identity variable and demonstrated that job attraction differs across industries.

Together, studies 1 and 2 successfully tested the material and confirmed that candidates are generally more attracted to organisations with a high perceived green identity (H1). While green identity was successfully manipulated using a company's organisational characteristics and general reputation, the employers did not actively advocate their sustainable practices in the job ads. Yet, nowadays many employers use job ads as a direct marketing tool to portray a desirable employer brand (Botha et al., 2011; Sokro, 2012). In fact, many recruiters are well aware that green marketing can be an effective technique in attracting candidates (Jones & Willness, 2013; Vinerean et al., 2013). The following part is concerned with the effectiveness of such strategies

and specifically aims to uncover potential limitations or even adverse effects of green marketing (i.e., implications of greenwashing).

5.5 Study 3: Interaction of identity and marketing on job intention

Having established that job seekers generally prefer employers with a high perceived green identity, study 3 explores whether active green marketing enhances or damages this tendency. Specifically, the potential interaction effects between identity and marketing on job-pursuit intentions were examined, predicting that green marketing can increase the number of applications when companies are considered as having an authentic green identity. However, when a company with a low green identity actively advertises its environmental practices, the information is considered as misleading or disingenuous, resulting in even lower application numbers than neutral marketing.

5.5.1 Procedure and material

Three hundred and ten job seekers (M_{age} = 25.02 years, SD_{age} = 3.89; 41% female) participated online as part of their entrance into a global talent pool. Using a between-subjects design, each participant is presented with one hypothetical job advertisement to read. Only companies that were reliably judged by the pilot study (study 2) to have a strong perceived green identity were selected. Moreover, participants were randomly assigned, were assured confidentiality, and received the same information about what the organisation offers across all conditions.

In contrast to the previous studies, the job descriptions have been adjusted by adding phrases that emphasise green practices and values (i.e., active green marketing), resulting in a 2 (green vs. non-green identity) × 2 (green vs. non-green marketing)

experimental design. Prior research is followed to manipulate green marketing in terms of corporate sustainability practices in the treatments (e.g., Greening & Turban, 2000; Jones et al., 2009). Corporate sustainability concerns whether the organisation takes precautions to minimise any potential negative influence on the environment, emphasises sustainable practices in the workplace, and promotes investments in green initiatives. These particular practices are used because (a) they are consistent with common definition of CSR, (b) they relate to the attractiveness of an organisation (Backhaus et al., 2002), and (c) they represent highly discretionary aspects of green identity.

This was applied by presenting the values of the organisation (the symbolic benefits), which reflected both an organisation's internal and external orientation. The information was presented under the headings 'our key values', 'our employees about us', and 'our goal'. These three headings used different formulations to emphasise the same set of values. The purpose of this was to ensure that the participants noticed the importance of these values for the organisation. For example, in the non-green marketing condition, participants were told, "We always put our customers first. We strive to maximise our cost-benefit ratio and to be more successful than our competitors. To achieve it, we do not hesitate to do what it takes to create the best services [products] – at any costs." Whereas in the green marketing condition, participants were told, "We're in business to save our home planet. As the climate crisis deepens, we see an inevitable need to protect the environment. For us, sustainability means providing more and cleaner energy solutions in a responsible way [durable products while using less resources]."

After each ad, participants again completed items assessing their perception of the green identity of the company as well as their interest in and intention to apply for the position. Moreover, a one-item variable asking for the perceived authenticity of the company is added as a further manipulation check: 'One a scale from 0-10,

how authentic and trustworthy do you think this company is?' Lastly, participants answered demographic questions and were debriefed.

5.5.2 Results and discussion

Before conducting the moderation analysis, tests for a successful manipulation were conducted. Participants correctly detected the difference between high and low green companies, $t(308)$ = -15.761, $p < .001$. All the subsequent analyses used ANOVAs with company identity and marketing as between-subjects factors. As expected, companies with high green identity received higher job-pursuit intentions than low green identity companies ($M = 4.53$, $SD = .95$ vs. $M = 3.24$, $SD = .82$, respectively), $F(1, 308) = 164.252$, $p < .001$, $\eta^2 = .346$. Green marketing also resulted in higher job intentions (with $M = 3.99$, $SD = .78$ in the green and $M = 3.80$, $SD = 1.29$ in the non-green marketing condition), resulting in a marginally significant main effect $F(1, 308) = 3.897$, $p < .05$, $\eta^2 = .042$.

Critically, the analysis revealed a significant interaction effect between identity and marketing on job-pursuit intention, $F(1, 308) = 27.528$, $p < .001$, $\eta^2 = .083$. Simple effect tests show that for companies with a high green identity job-pursuit intentions were significantly higher in the green marketing condition ($M = 4.67$, $SD = 1.04$) as opposed to the non-green marketing condition ($M = 4.35$, $SD = 0.79$), $F(1, 153) = 4.264$, $p < .05$, $\eta^2 = .027$. Furthermore, when companies use green marketing strategies, despite having a low perceived green identity, job-pursuit intentions were even lower ($M = 2.93$, $SD = .84$) compared to the non-green marketing group ($M = 3.63$, $SD = 0.59$), $F(1, 153) = 34.417$, $p < .001$, $\eta^2 = .184$, thus confirming H3.

Results show that job seekers favour companies with a consistent green image and hesitate to apply for companies with inconsistent or disingenuous branding. It is possible that job seekers evaluate the authenticity of a job ad before submitting an application. In order to determine whether this effect is an actual result of authenticity,

participants were further asked to rate the trustworthiness of the ad. Results show a close similarity between the trustworthiness and job-pursuit intention scores (r = .287**). Companies with inconsistent branding – non-green companies with green advertising – received the lowest trust scores, $F(1, 153) = 8.762$, $p < .001$, $\eta^2 = .028$ (see Figure 5.1). This further suggests that job seekers are sensitive to sustainability aspects presented in job ads and can spot misleading information, again hinting towards the negative effects of greenwashing.

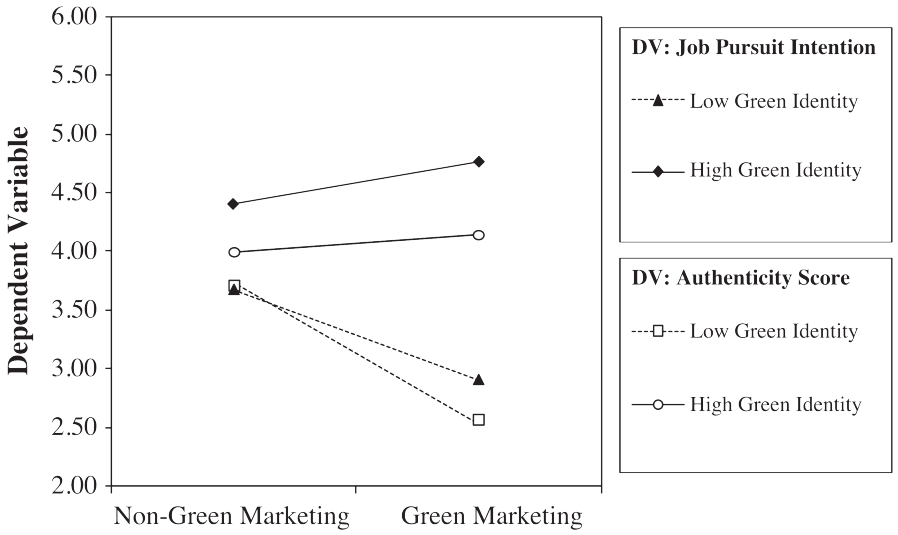

Figure 5.1: Interaction means plot for DVs – job-pursuit intentions and trustworthiness.

Study 3 provides further insights into the effects of green identity on job-pursuit intentions by detecting the moderating effect of green marketing. Consistent with previous findings, results indicate that companies with a high perceived green identity are again favoured over low green identity companies. Interestingly, job attraction scores were even higher when employers with a high perceived green identity emphasise their sustainable practices via green marketing. On the contrary, the interaction also illustrates that job seekers can detect misleading marketing, such as when employers with a low green identity disingenuously try to advertise their green policies. It can be concluded that job ads attract job seekers when being consistent

with the perceived company image. However, when the green identity of a company is low, green marketing can lead to an even lower number of applications than no green marketing. Thus, green marketing does not increase job attraction per se. It is rather a function of identity and ad campaign design.

5.6 Study 4: Factors that enhance or reduce the effect of greenwashing

Studies 1–3 consistently establish that green employers are more attractive than non-green employers and that falsely portraying oneself as a green employer negatively affects talent attraction. Despite its often-cited negative consequences, it is striking that many companies are still engaging in greenwashing (Delmas & Burbano, 2011; Shahrin et al., 2017; Wu et al., 2020). Consequently, the final section questions whether there are particular conditions under which greenwashing passes for legitimate, truthful marketing.

Specifically, the final study examined whether (a) the effect of greenwashing on talent attraction is stable across different types of job seekers and (b) certain individuals are more prone to conceiving misleading information as trustworthy. It is attempted to replicate the patterns previously observed while considering the candidates' predispositions more thoroughly. The negative effects of greenwashing on job attraction are expected to be amplified when candidates have a high environmental attitude. On the contrary, when job seekers exhibit a high P–O fit, job-pursuit intentions remain unaffected from communicative integrity.

5.6.1 Method

Four hundred current job seekers ($M_{\text{age}} = 28.61$ years, $SD_{\text{age}} = 4.26$; 38% female) participated online. Given the primary interest in how actual job seekers

would make their job decisions, and to make studies comparable, all participants were recruited using the same method as described in study 3. Participants were again randomly allocated to one of the conditions. The same job advertisements and between-subjects design were used. Each participant received one job advertisement to read. In addition to the items assessing job pursuits and perceived green identity, participants completed three items assessing P–O fit (Cable & Judge, 1996), e.g., 'To what degree do you feel your values match or fit this employer?', all of which showed adequate reliability levels with alphas ranging from .80 to .86, and four items assessing attitude (Whitmarsh & O'Neill, 2010), e.g., 'I think of myself as someone who is very concerned with environmental issues', alphas ranged from .90 to .94.

5.6.2 Results and discussion

Similar to study 3, results reveal a significant interaction effect of company identity and marketing on job appeal, $F(1, 399) = 20.426$, $p < .001$, $\eta^2 = .049$. The highest job-pursuit intentions were found in the green marketing and green company condition ($M = 5.12$, $SD = 1.79$) and the lowest in the green marketing and non-green company condition ($M = 2.89$, $SD = 1.49$), again confirming H3.

Environmental attitude. There is a significant three-way interaction of company identity, marketing, and environmental attitude on job-pursuit intentions, $F(1, 399) = 7.343$, $p < .01$, $\eta^2 = .018$. In the green company condition, participants with high attitude reported greater attraction to green job ads ($M = 6.50$, $SD = 0.55$) than non-green ads ($M = 5.19$, $SD = 1.02$), $t(98) = -7.914$, $p < .001$, $d = .59$. In the non-green company condition, participants with high attitude favoured non-green ($M = 3.32$, $SD = 1.11$) over green ads ($M = 2.65$, $SD = 1.57$), $t(98) = 2.474$, $p < .05$, $d = .24$. Lastly, companies with a low green identity received significantly higher job intentions from participants with low attitude ($M = 3.40$, $SD = 1.28$) than with high attitude ($M = 2.98$, $SD = 1.39$), $t(198) = 2.201$, $p < .05$, $d = .15$.

Results demonstrate that job seekers chose companies that are in line with their environmental attitude and that this effect can be amplified using green marketing. However, when employers advertise a green company image without having an authentic green identity, especially amongst environmentally conscious job seekers, ads can lead to adverse effects. In simple terms, green marketing can be highly effective when targeting the right candidates but harms employers with a low green image. In practical terms, many companies believe that they can attract environmentally-conscious talent by advocating a green policy (Willness & Jones, 2013). However, results show that (a) job seekers intentionally chose employers that are in line with their environmental attitude, (b) non-green ads are actually more effective amongst candidates with low attitude scores, and (c) job seekers can detect inauthentic green employer brands, resulting in even lower applications than neutral ads.

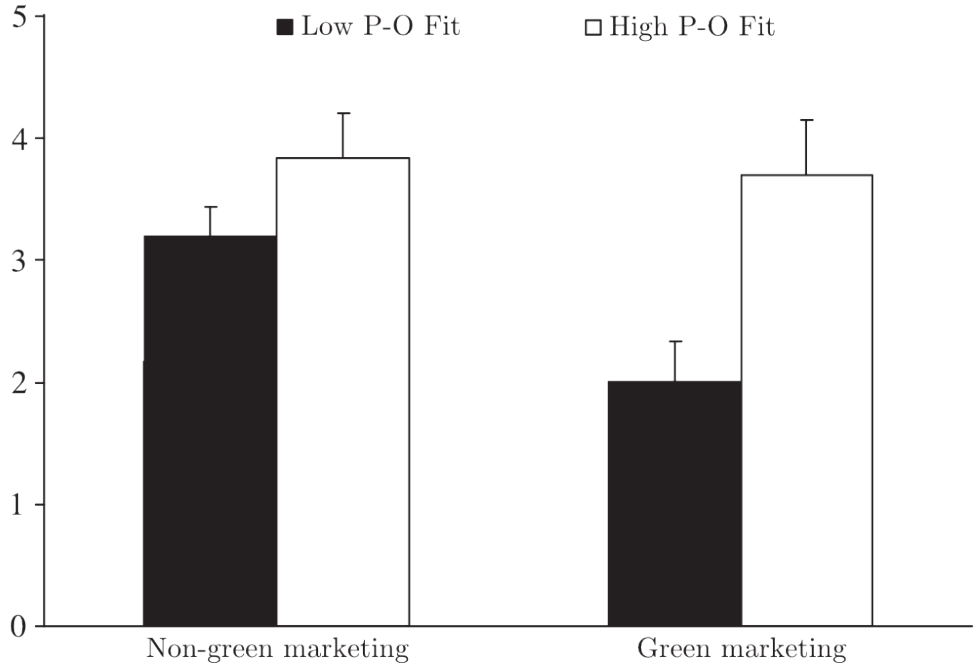

Figure 5.2: Interaction means plot for job-pursuit intentions in the non-green company condition.

Person–organisation fit. Besides environmental attitude, the moderating effect of P–O fit was further examined. Moreover, P–O fit positively correlates with

job-pursuit intention (r = .360**). Thus, candidates with a high identification with the organisation show higher attraction to the position. Next, it was examined whether this result can be reinforced when companies actively advertise their green policies (i.e., using green marketing). There is no significant three-way interaction between marketing, identity, and P–O fit. However, there is a significant two-way interaction between P–O fit and marketing on job-pursuit intention, $F(1, 399) = 30.891$, $p <$ .000, $\eta^2 = .068$. The lowest job intentions were found amongst participants with a low P–O fit in the non-green company and green marketing condition, and the highest intentions were found in the green company condition amongst participants with a high P–O fit. Job seekers are less attached to deceitful employers and potentially show a greater readiness to detect misleading information. Most importantly, in the non-green company condition, participants with a low P–O fit reported greater attraction to the non-green ads than to the green ads, $F(1, 196) = 10.928$, $p < .01$, $\eta^2 = .039$, whereas job seekers with high P–O fit were indifferent between green and non-green job ads (p > .05, see Figure 5.2).

Overall, P–O fit can be considered a significant factor in influencing job-pursuit intentions. Introducing P–O fit to the evaluation of ad authenticity and perceived green identity offers deeper insights into the conditions under which job seekers choose green (or non-green) employers. The first result confirms Cable and Judge's (1996) finding that P–O fit can increase job intentions and that participants with high P–O fit are indifferent towards company authenticity. More importantly, results demonstrated that high P–O fit can diminish the negative effects of greenwashing despite providing misleading or disingenuous information. This alternative account suggests that the effects of greenwashing on job appeal are not solely driven by green marketing and identity but can further be moderated by logical assessments of whether one's personal ideals and expectations match the organisation's description. Essentially, when the organisation fits within the expectations of the candidate, individuals tend to disregard or even miss the potentially misleading claims of sustainability

(i.e., greenwashing) and indicate high job intentions despite the green claims being disingenuous.

5.7 General discussion

This research addresses a simple question: Can genuine green companies attract as many job seekers as non-green companies pretending to be green? To find an answer, the studies experimentally assessed the effects of greenwashing on employer branding and job pursuit interests. Across four field experiments, various recruiting messages have been tested for their effectiveness on talent deception and employer attractiveness, all aiming to find ways to better understand why companies engage in greenwashing and how to potentially tackle the systemic use of greenwashing in employer branding.

It is a common-held belief that green companies attract more candidates (Albinger & Freeman, 2000; Barrena-Martinez et al., 2015; Greening & Turban, 2000; Jones et al., 2014; Tsai et al., 2014) and that explicitly communicating an interest in environmental issues creates a more favourable image than entirely neglecting the topic (De Jong et al., 2018). This research challenges these assumptions. It was proposed that the effects are more complex than previously reported (e.g., Greening & Turban, 2000; Turban & Greening, 1997). In fact, the studies contradict De Jong and colleagues' (2018) claims of greenwashing being a "myopic strategy" (p. 108) due to its ineffectiveness in influencing purchasing interests.

Further research was needed to understand what additional factors influence the translation of organisational attraction to job-pursuit intentions and, perhaps even more importantly, its limitations and adverse effects. By specifically manipulating the authenticity of marketers and strategically employing deceptive marketing techniques, this chapter uncovered the limitations and boundaries of green marketing that are

often neglected in the above-mentioned studies. Addressing this controversy makes this research one the first to examine the effects of greenwashing in talent attraction.

5.7.1 Theoretical implications

In keeping with calls for a more socio-cultural approach to understand the adverse effects of green marketing (see, e.g., Willness & Jones, 2013), the current work studies how green advertising and corporations' environmental identities impact job seekers' willingness to apply for a job. Overall, findings indicate that green recruiting messages have different effects on job-pursuit intentions depending on the perceived organisational identity, environmental attitude, and organisational fit.

The primary research goal can be confirmed by detecting an interaction between marketing and perceived identity on job appeal. When employers are considered as having a genuine interest in promoting sustainable practices, the communication on green policies makes them more attractive for prospective employees. This is consistent with research on consumer preferences, which has demonstrated that the success of environmental advertising is dependent on both company identity and marketing efforts (Follows & Jobber, 2000). Additionally, this finding is in line with several studies on the effects of green cues (Atkinson & Kim, 2015; Backhaus et al., 2002; Parguel et al., 2015; Spack et al., 2012) and therefore adds to signalling theory. When exposed to limited information about an employer, job seekers actively search for cues to complete the company image. The use of fictitious companies showed that recruitment ads are an important source of information and that job seekers are actively looking for green signals when evaluating an organisation, especially if an organisation is not particularly well known (Breaugh & Starke, 2000; Kulik & Roberson, 2008; Rynes et al., 1991). Lastly, the significant three-way interaction demonstrates that applicants' interpretation of a job advertisement is even stronger when the company's green identity correlates with the job seekers' environmental attitude (Grier & Brumbaugh,

1999; Mick & Buhl, 1992; Williamson et al., 2008) and therefore hints towards positive influencing factors that can amplify the effect.

The benefits of this favourable image may explain the wide use of green messages in advertising since the 1960s (Easterling et al., 1996). Interestingly, however, this use does not always translate into favourable candidate impressions. In fact, job seekers become increasingly sceptical of environmental claims made by some of these organisations (Skarmeas & Leonidou, 2013). The studies demonstrate that green marketing can also have negative effects on the perceived reputation of organisations and in turn harms their attractiveness to job seekers. Across all studies, the lowest attraction scores were found in the non-green company and green advertising condition, indicating that candidates attribute a negative appraisal towards their prospective employer when firms are not "doing what they preach" (Nyilasy et al., 2014).

Study 4 primarily focused on testing whether the ability to detect greenwashing can be reduced. Results show that participants with a high P–O fit positively react to green messages, regardless of their authenticity. This result is particularly interesting since green advertising is often considered risky (Nyilasy et al., 2014; Torelli et al., 2020) and potentially harmful (Newell et al., 1998; Vanhamme & Grobben, 2009; Webb & Mohr, 1998), which may discourages companies to employ such strategies. However, it can be concluded that for job seekers with high identification with the organisation, green signals appear to play a subordinate role. In other words, adding a green message in a company's job ad can increase job attraction, even for non-green companies, as long as the P–O fit is high. Revealing a potential benefit of using green marketing is an important amendment to most research suggesting that greenwashing has primarily negative consequences (Chen & Chang, 2013; Chen et al., 2014; Parguel et al., 2011). This result might also explain the widespread use of greenwashing by organisations. Understanding when greenwashing can have positive effects on talent

attraction is key to building a more nuanced knowledge of why it is still widely used (Nyilasy et al., 2014) and how to effectively detect and combat deceitful organisations.

Finally, the studies examine potential cultural differences between perceiving and evaluating green job advertisements in China compared to the West. Firstly, the concept of greenwashing may be perceived differently in China due to variations in environmental awareness and societal priorities. While the West has been focusing on sustainability and environmental issues for a longer period, China's rapid industrialisation and economic growth have only recently led to the focus on these concerns. As a result, a lack of environmental awareness among Chinese job seekers may result in less scepticism of green job advertisements and more acceptance of companies' environmental claims. Secondly, the traditional Chinese concept of "saving face" (cn. mianzi) might influence how greenwashing and deception are viewed (André, 2013; Hwang & Hwang, 2012). Maintaining a positive public image and social reputation is highly valued in Chinese culture, which could lead to a greater tolerance for greenwashing as a means to enhance a company's reputation. In the West, on the other hand, there may be more emphasis on authenticity and transparency, which could result in a more critical evaluation of green job advertisements. Moreover, linked to authenticity, enforcement of environmental regulations may be inconsistent with company performance in China. This could contribute to Chinese job seekers placing less importance on a company's adherence to environmental standards, as they might not expect strict enforcement in the first place.

In conclusion, this chapter makes several contributions to the literature on corporate sustainability: Firstly, it expands previous findings on greenwashing to employer branding and green recruitment. In fact, this research specifically builds on the idea that the choice of an employer is a deliberate decision-making process that depends on a number of influencing factors and their interactions (Branham, 2005; Ganzach et al., 2002). Compared to other greenwashing experiments (De Jong et al.,

2018; Nyilasy et al., 2014; Parguel et al., 2011) that mainly investigate inconsequential purchasing decisions, this chapter specifically adds to greenwashing literature by focusing on meaningful, long-term decisions. Moreover, this research is the first to incorporate the notion of inauthentic green employer branding in job advertising and, in doing so, provides a new theoretical perspective for how job seekers' organisational image perceptions are formed and modified. Looking more closely into the relationship between identity and marketing indicates that green marketing can be seen as both beneficial and harmful depending on the perceived identity. Lastly, by conducting experimental studies of actual job applicants, this chapter assesses the causal effects of green marketing on perceptions of green identity.

5.7.2 Practical implications

The findings suggest that organisations would be well served to carefully consider their perceived green identity before promoting sustainable practices. It was shown that job seekers can correctly evaluate the extent of truthfulness or deception in green job advertising. Providing misleading information about an organisation's green values in its recruitment ads has strong negative effects on applicant attraction. Yet, despite being intimidated by potential scepticism or scrutiny associated with promoting green policies, company owners should not avoid green marketing per se. Organisations with genuine green identities should incorporate green messages into recruitment campaigns as green identity and marketing interact to increase the number of job applicants. The findings are in line with Aiman-Smith et al. (2001) who inferred that employers with good pro-environmental policies could advertise themselves as a method of attracting talent and that individual talent values may have a moderating impact. Since job seekers build their employer perception based on signals in job ads, green advertisement could be a good area to start. Ultimately, it is important to note that that environmental values might not be the most important factor in the choice of employer, as shown by study 4. As long as the fit between the candidate and

employer is high enough from a job seeker's perspective, candidates may disregard environmental communication.

5.7.3 Limitations and future research

The studies are subject to several limitations that suggest directions for future research. All studies investigated fictitious organisations, which allows to control for confounding variables, such as predispositions towards brands. While the ads were further modelled as closely as possible on actual, real-life companies (such as Patagonia Inc., Exxon Mobil, and Shell). Not using real companies limits the applicability of the results. Artificial ads are appropriate to study given the exploitative nature of this research yet future studies are advised to use the experimental framework amongst well-known employers. Moreover, the second study revealed that not all industries show strong differences. The results are limited to selected industries. Future research should extend the studies by examining a wider set of company types. Lastly, results of study 4 hint that other factors may also influence the effects of greenwashing on job-pursuit intentions. As mentioned before, job decisions depend on a variety of factors. Accordingly, more research is needed to detect additional moderating variables on the effect of greenwashing. Future research is encouraged to examine factors, such as personality traits, and perhaps also vary the organisational offers, such as salary, career prospects, and job responsibilities, in their impact on disingenuous green employer branding.

5.8 Conclusion

In summation, the findings present a more nuanced view on both the positive and negative ramifications of greenwashing that go beyond what is mostly examined in consumer behaviour. Sustainability communication in HR becomes an increasingly important global issue, which calls for researchers to widen their views and welcome

sustainability research into their agenda. The results showcase that a firm's perceived green performance can either enhance or damage its reputation depending on whether the firm's sustainability claims are considered genuine or misleading. The negative effects of providing misleading information are found to have significant impact on job-pursuit intentions and help both researchers and practitioners to better understand greenwashing practices in the recruitment domain. Without a profound understanding of green marketing across domains, disingenuous sustainability communication will continue to constitute severe ethical and societal harms and hurt all corporations in the long run.

6 | Green entrepreneurship and knowledge spillover

6.1 Overview

As demonstrated so far in this dissertation, customers, employees, policymakers, and entrepreneurs alike demonstrate a willingness to actively work on sustainable solutions and help transition towards a greener society. This study explores which local factors affect the creation of sustainable or green start-ups in a geographical area. The analysis aims to provide regional legislators with nuanced views of regional economic and sustainable policymaking and help them transitioning towards a greener economy. Building on knowledge spillover theory, results from 4,301 companies across Europe show that the driving factors for the emergence of green start-ups go beyond monetary incentives. Knowledge exchange and industry networks are equally – if not more – important in attracting green entrepreneurs. Results also reveal that green start-ups are more likely than non-green start-ups to change their location. Of those who change their location, green founders prefer large cities and have a negative inclination to establish their companies in small cities. Companies in the sustainable information technology (IT) industry are less likely to change their location, whereas green manufacturing companies are more likely to change. In summation, results

indicate that the location choices and resulting evolution of clusters for green start-ups are based on a number of variables, including local knowledge stock and spillovers, company density, availability of educated talent, and industry affiliations.

6.2 Introduction and present study

With the ongoing climate change, researchers and policymakers are keen to find more effective ways to slow or reverse global warming. Most nations agree that corporate practices are an essential part of the cause of environmental hazards and that fundamental change is required to mitigate adverse environmental and socio-economic consequences (Jones, 2017; Ndubisi & Nair, 2009). In this debate on combating climate change, entrepreneurship is often cited as a panacea for current societal challenges. In fact, start-ups are often considered the *spark* needed to fuel innovation. In light of the rising demand for sustainability, many researchers propose that green entrepreneurship has the potential to shape the future of economic and social welfare and ultimately plays a crucial role in providing a cure for transitioning towards a greener society. However, there is still a considerable amount of ambiguity about the role of green entrepreneurship and how it may unfold (Hall et al., 2010; Lotfi et al., 2018).

As will be shown throughout this chapter, entrepreneurship – and green entrepreneurship in particular – is vastly different from established corporate operations. Sustainable businesses are often faced with greater challenges than purely economically oriented companies (Gast et al., 2017; Jones, 2017). For instance, while regular businesses are devoted to making a profit, achieving growth, or reserving assets (Nicholson & Anderson, 2005), green enterprises typically aim to increase social welfare in addition to achieving economic objectives. The dichotomy of reducing environmental impact while staying economically viable raises the demand for external funding. In fact, green companies often face extensive technological development in order to

achieve innovation, which prolongs a potential market entry and increases financial dependencies. Green firms also show a higher need for knowledge and talent than regular companies (Huang et al., 2020), and it is often expected that these individuals not only exhibit technical expertise or business acumen but also share ideological views with the company.

As a result of these challenges, sustainable ventures are often considered to having higher entry barriers, lowering the number of new firm entries and slowing sustainable progress. In an attempt to encourage innovation, policymakers frequently provide financial incentives either via subsidies on products (Moon & Hwang, 2018) or by offering funding to potential founders (Schaper, 2005). While these initiatives have demonstrated some success, this chapter argues that funding alone is not the only factor encouraging green entrepreneurship. Specifically, it is argued that sustainable firms are particularly dependent on their founding environment. Despite the potential for being a key accelerator in achieving the long-term change that entrepreneurship is often presented with, research on the relationship between start-ups and their entrepreneurial environment, particularly the factors that go beyond financial support, remains nascent.

Recently, some theoretical attempts have been made to explore why sustainable start-ups locate in a specific area (see, e.g., Cainelli et al., 2015; Giudici et al., 2019). Researchers argue that green firms have a high demand for knowledge and thus locate in regions with a better access to academic institutions. While these studies provide initial evidence of the importance of knowledge stock in sustainable entrepreneurship, most of these insights are hypothetical and more prescriptive than descriptive (Hall et al., 2010). It is yet to be thoroughly answered why green hubs are formed, what factors motivate entrepreneurs to move, and how to potentially leverage insights into effective policymaking (Demirel et al., 2019; Henry et al., 2020; Tiba et al., 2020).

To address these questions, it is crucial to examine cross-cultural migration patterns using actual data. Unfortunately, most studies on this subject either focus on a singular economy (such as Italy in the case of Giudici et al., 2019), which limits the generalisability and prevents evaluating the influence of national or bilateral policies (Cainelli et al., 2015), or are theoretical or hypothetical scenario-based studies (**fritsch2019regional**; Fuller-Love et al., 2006; Sinatti, 2019). As a result, Giudici et al. (2019) propose that scholars should "compare and contrast the creation of cleantech start-ups in the diverse European countries."

In response to this call, the fourth study in this dissertation explores the local factors that affect the creation of sustainable or green start-ups in a geographical area. A sample of 4,301 companies was extracted primarily from the start-up database Crunchbase as well as the statistical office of the European Union Eurostat. The novel dataset includes location choices and founder demographics from 21 European countries as well as a wide range of control variables. Contrary to most studies on green entrepreneurship, the wealth of the dataset further allows for examining industry-specific location choices and interactions with founders' career histories.

This chapter combines existing research on how local factors influence start-up development (e.g., Armington & Ács, 2002; Bonaccorsi et al., 2013; Colombelli, 2016; Glaeser & Kerr, 2009) with the emergent corporate sustainability research. To achieve this, the present study reconciles research on spillover theory and assumes that the proximity to universities and the density of existing firms play a crucial role in hub formation. Specifically, this study first attempts to identify prominent geographical influencing factors that distinguish green from non-green firms. Several local factors are considered: The availability of scientific and technical knowledge, the number of incumbent firms and start-ups as a potential indicator of sector-specific clustering, and access to both talent and funding as the main drivers attracting and agglomerating sustainable start-ups. Once these distinctions are made, rural areas are

considered in particular. Building on migration patterns of founders – namely whether they deliberately chose rural or urban areas to establish their companies – as well as industry effects within the sustainability sector, the likelihood and hazard of green firm creation in a geographically rural area are identified.

The findings show that regional access to scientific and innovative knowledge alongside access to funding and talent positively predict the number of green entrepreneurs in a given region. However, when comparing rural with urban areas, it was found that not all predictors have the same effect. While most green start-ups prefer to locate in urban regions, rural areas are not necessarily disadvantaged. Funding and start-up networks are important predictors of urban founders. Rural areas attract sustainable entrepreneurs when the technological output is high and the region displays a strong network of universities and incumbent firms. This study also found that migration patterns of green founders depend on the business sector or industry in which the company operates. While sustainable IT start-ups favour larger cities, despite a higher competition for talent and funding, sustainable manufacturing start-ups prefer to establish their companies in rural areas with arguably lower support structures for green ventures. This chapter concludes with a discussion on how policymakers can encourage this form of entrepreneurship in their local regions.

6.3 Literature review

When analysing the characteristics of entrepreneurship and its emergence, it is natural to start examining *where* such companies are founded. Start-ups and their regions are interrelated, as such that economic growth and innovation can be fostered by a region's legislature and in turn a thriving start-up culture can lead to regional development and increase economic welfare (Audretsch, 2007; Fritsch & Mueller, 2004; Harris, 2011). A considerable amount of research has investigated the

impact of entrepreneurship on a region (Audretsch & Keilbach, 2004; Baptista et al., 2008; Thornton et al., 2011), the relationship between academia and start-ups through knowledge spillovers (Ács et al., 2013; Ghio et al., 2015), as well as the formation of industry or technology clusters (Casper, 2007; Feldman & Francis, 2006; John S & Pouder, 2006) and spatial determinants of entrepreneurship (Capello, 2002; Ghani et al., 2014). However, the relationship between green entrepreneurship and a region is yet to be examined thoroughly.

6.3.1 Knowledge spillover theory

Start-ups often exhibit a high demand for technical and scientific knowledge. According to the spillover theory of entrepreneurship (Audretsch, 2007; Guerrero & Urbano, 2014), this knowledge likely spills over from research institutions and enterprises in a region, favourably influences the establishment of start-ups in that area, and fosters the development of innovative products and services (Bonaccorsi et al., 2013; Giudici et al., 2019).

Several scholars empirically illustrate the importance of university knowledge in promoting local innovation and entrepreneurship (e.g., Ács et al., 2013; Ghio et al., 2016). Due to regular face-to-face exchanges between researchers and practitioners, the effects of university knowledge spillover are often argued to be highly localised (Ghio et al., 2015; Ghio et al., 2016; Giudici et al., 2019). Bonaccorsi and colleagues (2013) show that the content of university knowledge spillover is strongly related to the universities' scientific expertise, and Bonnet et al. (2006) found a close relation between entrepreneurial tendency and education amongst undergraduate engineering students. The regional availability of universities focusing on traditional sciences, such as physics or chemistry, and technical majors, such as electronics or engineering, appears to be positively related to technology-based entrepreneurship in that area

(Giudici et al., 2019). Consequently, spillovers are specifically relevant for technology start-ups.

6.3.2 Spatial agglomeration and hub formation theory

As a prerequisite of specialised technological clusters, spillover theory provides the foundation for hub formation theory. Introduced by Marshall in the late 1800s, spatial concentration and agglomeration externalities have been identified as important components of innovation and economic progress (Lucas Jr, 1993; Nelson & Winter, 1982; Romer, 1990). Early interpretations of the theory explore the proclivity of information to disseminate, or *spill over*, to create regional benefits and strengthen industrial growth. Building on this, spatial economics research explains the choice of a firm location mostly through optimisation behaviour, which entails either reducing production costs (including workers and capital) or maximising potential profits (Capello, 2014). Since the introduction of the new economic geography (NEG) in the 1990s and the growing literature on agglomeration economies (Jacobs, 2016; Marshall, 2009; Porter, 1990), the importance of spatial concentration on the location choice of economic activities and the establishment of new businesses has been widely explored (Artz et al., 2016; Beaudry & Schiffauerova, 2009; Capozza et al., 2018; Rosenthal & Strange, 2003). To date, it is commonly believed that entrepreneurial activity is not fairly spread across geographical areas (Glaeser et al., 2010; Zheng & Du, 2020) and that spatial distribution of entrepreneurial activity is dependent on a range of local characteristics, including the availability of funding, access to knowledge and talent, industry networks, and public policies (Ács et al., 2009; Audretsch & Keilbach, 2004; Ghio et al., 2015; Ghio et al., 2016).

The benefits of being close to other businesses and the resulting formation of sector-specific hubs have been highlighted by a growing segment of theoretical and empirical entrepreneurial research (Ács et al., 2013; Corradini, 2019; Ghani et

al., 2014). This research builds on the idea that small-business innovation may be modelled as a function of the inventive activity and generation of new knowledge of incumbent enterprises and organisations (Ács et al., 2013). This clustering of akin businesses plays a central role in the formation of new technology-based enterprises since start-ups rely on access to knowledge and innovative ideas through spatially localised knowledge-spillover processes (Plummer & Ács, 2014; Qiu et al., 2017; Trippl & Maier, 2011; Zhao & Islam, 2017).

Despite the importance of localised spillovers, two opposite theories on the location of such hubs have been introduced. One theory posits that migration to technological clusters is often found in metropolitan areas with a higher population, such as San Francisco, New York, or London (Dahl & Sorenson, 2009). In Germany, for instance, entrepreneurs typically migrate to conurbations with a higher total number of other entrepreneurs, namely Berlin, Hamburg, and Munich (Scheuplein & Kahl, 2017). Urban regions can have several advantages, including having better access to funding, such as venture capitalists (Sorenson, 2018), closer connections to universities (Roche et al., 2020), culturally and ethnically diverse environments (Collins, 2003), and greater availability of talent (Adler et al., 2019; Duranton & Puga, 2001; Glaeser et al., 1992). All of these factors are expected to favour the likelihood for a start-up culture to emerge (Mayer & Motoyama, 2020).

Another perspective in the formation of hubs is put forward by the local embeddedness theory. It is proposed that entrepreneurs launch their businesses close to where they live or work (Andersson & Larsson, 2016; Fritsch & Storey, 2014; Shepherd, Williams, et al., 2015). Thus, despite being associated with a lesser thriving start-up culture, several studies suggest that smaller cities can equally attract start-ups. In Germany, cities like Essen, Duisburg, or Leipzig are demonstrating strong growth in the number of businesses and jobs in the technology sector (Brixy & Grotz, 2007; Fritsch & Wyrwich, 2014; Hofer & Potter, 2010; Voss & Mueller, 2009).

Part of the reason for the rise of new technological entrepreneurship centres are the rising expenses in metropolitan areas (Butler et al., 2020); this is the case for capital cities like London or Berlin with exceeding rent prices and higher wages. Alternatively, research proposes a local bias in entrepreneurship whereby founders prefer establishing their businesses in a familiar environment, either their home region or an area in which they have deep roots. Accordingly, founders facilitate their social and professional connections in their region (Martynovich, 2017) and take advantage of having better access to local resources, such as funding, talent, customers, and suppliers (Bau et al., 2019). Researchers also suggest that home regions lead to higher satisfaction and success of founders due to social ties and existing networks in their region (Dahl & Sorenson, 2012; Michelacci & Silva, 2007). Lastly, digital technologies nowadays allow start-ups to outsource certain tasks (e.g., cloud-based computing, Ross & Blumenstein, 2015), giving them less dependency on local talent and greater flexibility in selecting a location (Heger et al., 2011).

Together, these findings pose a puzzle: Are green entrepreneurs *better off* establishing their firms in their local regions or should they follow trends of migrating to urban areas? Understanding the importance of local entry barriers and examining why certain locations can attract and retain green entrepreneurs is crucial for explaining regional variation in entrepreneurial activity.

6.3.3 The formation of green hubs

As a form of sustainable entrepreneurship, green entrepreneurship is the process of developing and distributing marketable products or services with a focus on environmental preservation, programs, and processes (Zhao et al., 2021). As will be shown in the course of this chapter, different regions have different representations of sustainable businesses. Some initial research (e.g., Demirel et al., 2019; Giudici et al., 2019) has identified various geographical concentrations focusing on environmental

technologies. Corradini (2019), for instance, demonstrates that the number of green start-ups is not evenly spread, emphasising the relevance of local features. One potential explanation for this nuance is that sustainable start-ups are often associated with complex or novel technologies, resulting in high demand and fluid access to knowledge (Cooke, Morgan, et al., 1999; Mans et al., 2008; Tanner, 2014). Proximity to academic institutions as well as access to a broad range of talent and support organisations therefore provide an ideal breeding ground for green enterprises. As a result, green clusters are likely formed where these conditions are met.

Another hypothesis derived from previous literature builds on the difference between tangible and intangible location factors. Different regions have different abilities to recognise and respond to technology opportunities (Saxenian, 1990). Previous research has found that even after controlling for industry structure, labour qualification, and economic well-being, a significant portion of the attraction of new businesses between regions remains unexplained, highlighting the potential importance of intangible factors (Giudici et al., 2019; Mrkajic et al., 2019; Shrivastava & Tamvada, 2019).

These characteristics can likely define localised associative capacities and learning processes (Bathelt & Glückler, 2003; Moran et al., 2018; Storper, 1995). In other words, green start-ups are more likely to search for informal or intangible (value-driven) location characteristics rather than purely economic factors. In fact, sustainable businesses generally employ individuals with high environmental identities and social intelligence (Tuan, 2019). These components describe the collection of informal relational resources that enable idea sharing and recombination, which in turn result in more effective information transmission and increased capacities to take advantage of technical opportunities revealed by knowledge spillovers. This might lead to a regional environment with greater technical dynamism and more technological entrants.

6.3.4 Research hypotheses

In essence, spillover theory suggests that start-ups locate in areas where they can maintain close ties to research institutes and incumbent companies to leverage existing knowledge for their technological developments. Building on this, start-ups are likely to agglomerate into hubs with better overall access to that knowledge. Due to a range of challenges unique to green companies, this study argues that entrepreneurs in this realm have an increased demand for external support and are more likely to be embedded in their respective regions. As a result, the following hypotheses can be derived:

Funding. Compared to conventional start-ups, sustainable technology companies are often associated with ample research and development, prototyping, patenting, and manufacturing, as well as commercialisation expenses (Grubler et al., 1999). In fact, green entrepreneurs are faced with a two-fold challenge of catering to both environmental and technological externalities (Jaffe et al., 2002; Rennings, 2000). Accordingly, green start-ups are associated with substantial financial risks that may reduce overall investment opportunities. This is underlined by below-average investment returns in the sustainability sector (Bygrave et al., 2014).

Moreover, sustainable technology providers compete against established organisations (e.g., conventional power production or fossil fuels) that are well-oiled and well-connected, allowing them to potentially offer compelling pricing at the expense of hidden societal costs (Cohen & Winn, 2007). Investors or traditional financial institutions such as banks are also more likely to be inexperienced with innovative technologies, prompting them to provide investments at higher rates, again affecting sustainable business models (Wiser & Pickle, 1997, 1998). Lastly, access to funding, markets, and government protection are all dependent, in part, on the amount of cognitive or socio-political legitimacy a green start-up achieves (Aldrich & Fiol, 1994).

Legitimacy theory builds on the idea that entrepreneurs' perceptions of institutions and organisations can have a significant influence on their decisions and actions. Founders must learn to identify and behave in accordance with societal norms to obtain legitimacy and ensure the development and survival of their businesses (Bruton et al., 2010; DiMaggio & Powell, 1983). Green start-ups are particularly challenged to signal their value to stakeholders. As part of the legitimisation process of new businesses, green organisational identity, driven by the assumption of prospects, must match the expectations of a wide range of audiences in addition to entrepreneurs' values and views (O'Neil & Ucbasaran, 2016). As a result, pro-environmental behaviour might be viewed as a bid for legitimacy.

To cope with these challenges, it is expected that external funding is an essential factor in determining green entrepreneurs' location choices. Specifically, it is assumed that green start-ups locate in areas with higher funding availability.

Hypothesis 1 (H1): *There is a positive relationship between the number of green start-ups and access to funding in a given region.*

Scientific knowledge. Given that green start-ups can be considered a subgroup of technology start-ups (Bjornali & Ellingsen, 2014) and are often associated with high innovation and technological output, and building on spillover theory, it is expected that the regional availability of university knowledge positively relates to green entrepreneurship in a given region. Since green companies have a higher demand for technical expertise than average start-ups, they are expected to locate in areas with a higher potential for knowledge spillover.

Hypothesis 2 (H2): *There is a positive relationship between the number of green start-ups and number of universities in a given region.*

Human knowledge. One aspect linked to knowledge spillover is access to talent. This does not necessarily mean university graduates but talent on all levels. Simply put, innovation requires talent. Sustainable technologies generally demand a critical mass of knowledge, multidisciplinary skills, and interpersonal and organisational management resources that are complicated, cumulative, and most importantly expensive or difficult to obtain (Hamdouch & Depret, 2012).

Moreover, Parrish (2010) found that many entrepreneurs establish green businesses because they care about the environment and wish to improve society. As shown in chapter 5, employees can be equally sensitive toward the company's environmental identity. As a result, searching for suitable talent and finding a match may be more challenging since employees need to bring the required technical or managerial skills and should also exhibit a high P–O fit with the company's values to integrate their expertise, work attitudes, and professional conduct effectively. In this regard, significant efforts must be made to mobilise and train employees, acquire know-how, and educate employees about new green technologies and services, as well as their commercialisation (Muro et al., 2011).

Hypothesis 3 (H3): *There is a positive relationship between the number of green start-ups and number of educated talent in a given region.*

Marketable knowledge. While the number of universities and educated talent can provide an implicit measurement of a region's knowledge stock, researchers in the realm of spillover theory frequently cite the number of patents as a way to measure innovation output and marketable knowledge in a certain region (Chang et al., 2013; Fallah & Ibrahim, 2004; Xiang et al., 2013). Colombelli (2016), for instance, demonstrates that the number of patent applications filed by local businesses correlates with the local technological output. Building on this, it is anticipated that the amount

of technical knowledge available on the market, reflected in the number of patent registrations, will have a favourable impact on forming green firms on a regional level.

Hypothesis 4 (H4): *There is a positive relationship between the number of green start-ups and number of patents in a given region.*

Industry knowledge. While traditional approaches favour location choices with lower competition in order to increase market share (for a review, see Singh and Lumsden, 1990, and for the theoretical rationale, see Hannan and Carroll, 1990) in today's globalised economy, more companies are actively seeking industry collaboration to achieve a mutual added value (Dal Bello et al., 2021; Guiso et al., 2021). Building on spatial concentration theory, it is postulated that green start-ups favour regions with a high firm density over sparsely populated areas to create additional positive spillover effects from established companies.

Specifically, it is expected that green start-ups choose their locations based on the number of both established firms as well as other start-ups. The rationale for this hypothesis is threefold: Firstly, one key business model that green companies adopt is to address clients who aim to reduce the costs of their operations, minimise environmental hazards and carbon footprint, and adhere to relevant laws, regulations, and other environmental standards. This highlights the importance of customer proximity as demands and regulations can change from one region to another. Thus, being close to a higher number and broader range of potential customers may stimulate business development and sales. Secondly, a potential goal of new firms is to be acquired by a larger firm, again supporting the idea that proximity to a heterogeneous group of established companies is preferred over sparsely populated regions (Jacobs, 2016). Lastly, being close to other start-ups helps green start-ups to leverage existing infrastructure.

Hypothesis 5a (H5a): *There is a positive relationship between the number of green start-ups and number of incumbent firms in a given region.*

Hypothesis 5b (H5b): *There is a positive relationship between the number of green start-ups and number of non-green start-ups in a given region.*

6.4 Method

6.4.1 Data sources and variable construction

A novel dataset containing a broad range of company information was obtained via different online databases. The first source is an online directory of start-ups called Crunchbase. The database allows for the mining of company statistics, founding date, founding members, industry sectors, financing rounds, and employee biographies (used in recent prior work, Roche et al., 2020; Wu et al., 2020). The second set of data was collected from the global online talent database Experteer. Contrary to LinkedIn, the database is designed explicitly for high-ranking individuals and entrepreneurs, consists of 1.3 million individuals globally, and primarily focuses on talent in Europe rather than North America. Economic and macro data was collected via the statistical database of the European Commission Eurostat.

To collect a balanced sample of companies across regions and to account for Europe's geographic fragmentation, a multilayered random sampling method was employed. From the sample of 1.3 million individuals in the talent database, only current founders (i.e., people whose job title includes the keyword 'founder') were selected.[1] Additionally, only individuals who founded their companies in Europe were included, resulting in a total of 51,000 entries.[2]

[1] Synonyms like 'entrepreneur' and translation of the keywords in other languages were used to expand the data-mining process.

[2] Self-employed individuals, freelancers, and part-time entrepreneurs were excluded.

To address the primary research objective of finding differences between green and non-green companies, the next step filtered the sample based on their sustainability practices and business model. The goal was to select about 50% of the sample based on their focus on sustainable products or services. To determine which companies can be categorised as 'green', the pre-defined industry categories were used. Although the information is primarily user-generated, marketing and research specialists from the databases review them regularly. In addition, each company's website was carefully reviewed to see if its primary goods, services, and technology could be classified as green. This classification was based on current definitions of green enterprises provided by the Bureau of Labour Statistics in the US (US Bureau of Labor Statistics, 2013). The bureau's definitions give a clear, comprehensive, and quantifiable description of green activities, making the classification simple and unambiguous, for example, (a) "businesses that produce goods or provide services that benefit the environment or conserve natural resources" or (b) "businesses that use more environment-friendly production processes or use fewer natural resources than their peers" (for a detailed overview of this method, see Mrkajic et al., 2019). The second part of the sample served as a control group and was collected randomly without any industry filter being used.

The final dataset contains a total of 4,301 companies from 21 European countries. For several reasons, the sample focuses on companies operating in Europe. Firstly, countries in Europe are frequently ranked amongst the highest in sustainable development and progress towards achieving all 17 Sustainable Development Goals (SDG). In fact, in the 2021 ranking of the SDG performance of all 193 UN member states, 28 of the top 30 countries are from Europe (Sachs et al., 2021). Moreover, European countries are often described as having a high quality of entrepreneurship and extent and depth of supporting an entrepreneurial ecosystem (Ács et al., 2017). Lastly, based on the Environmental Performance Index published by the World Economic Forum, European countries dominate the top 10 when it comes to environmental

spending (Hsu & Zomer, 2014). The high prevailing sustainable attitude of its citizens and companies can ideally serve as a role model in developing an explanatory and regulatory framework for other regions. Examining the effectiveness of such policies in Europe constitutes an ideal empirical context in which green entrepreneurship is studied. The countries included in this study are Austria, Belgium, Bulgaria, Czech Republic, Denmark, England, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, and Switzerland. Due to the smaller population and size of the sub-sample, some countries have been merged; e.g., Denmark, Sweden, Norway, and Finland have been labelled 'Scandinavia'; see Table A2 for a full list. Industries in this sense include all secondary industries beyond being a green or non-green firm.

Dependent variable. The main DV of interest is dummy-coded and indicates whether a company is considered green based on the aforementioned criteria. As Table A1 shows, 45.7% of the companies in the sample fit in this category. The remaining 54.3% of companies serve as a control group and take a value of zero.

Independent variables

Building on the hypotheses outlined above, six predictor variables are included in the analyses. All variables were constructed from the raw data provided by Eurostat. Specifically, the database has a wide range of statistics and indices. What makes this dataset unique is that it measures these statistics on the city level, allowing to draw data from a total of 1,100 cities across Europe (Eurostat, 2022).

The first variable of interest, funding, was adapted from the 2020 European survey on the amount of funding that enterprises received for R&D or other innovation activities. The variable has been log-transformed to account for the large difference between regions.

Table 6.1: Description of variables.

Variable	*Description*
Dependent variable	
Green start-ups	Number of environmental start-ups in the region (source: Experteer and Crunchbase)
Independent variables	
University index	Students in higher education per city divided by population of the city (year: 2020, source: Eurostat)
Education index	Adults aged 25-64 with a university degree per city divided by population of city (year: 2020, source: Eurostat)
Employment	Number of employed individuals devided by economically active population in the city (year: 2020, source: Eurostat)
Company density	Number of companies in the city (year: 2020, source: Eurostat)
Start-up density	Percentage of start-ups in the city (year: 2020, source: Eurostat)
Patents	Number of patent applications per 1,000 inhabitants in the city (year: 2020, source: Eurostat)
Additional variables	
Location change	Dummy variable that equals one if the founder has changed the location (>50km) when establishing the company and zero otherwise
Changed to small	Dummy variable that equals one if the founder has changed the location to a small city (population <50,000) when establishing the company and zero otherwise
Changed to large	Dummy variable that equals one if the founder has changed the location to a large city (population >250,000) when establishing the company and zero otherwise
Changed country	Dummy variable that equals one if the founder has changed the country when establishing the company and zero otherwise
Distance (log)	The distance in km between the previous and founding location (log-transformed)
Control variables	
Gdp per capita	Gross Domestic Product per capita of the region (year: 2020; source: Eurostat)
Population density	Population per square kilometer in the region (year: 2020; source: Eurostat)
Country	Country of residence of the founder
Industry	Industry affiliation, beyond being a green or non-green company
Founder gender	Male, female, or unidentified
Founder age	Measured in years
Founder education	Ranges from 1 = vocational college to 4 = PhD
Founding year	Indicates the year in which the company was established (source: Experteer)

The second predictor, universities, is used to measure the potential for knowledge spillover effects from academic institutions. The variable is measured using the number of academic institutions including vocational colleges, universities, and

business schools as listed by Eurostat and is divided by the region's population. Using the university quota as a relative value rather than the total amount of universities for each region allows to control for effects that arise merely due to larger populations, for instance, in metropolises.

On the contrary, the third variable, education, takes an absolute value that counts the number of individuals on the job market with at least a bachelor's degree in 2020. This variable aims to quantify the educated talent on the market.

To measure the level of technical output the number of patents registered in a given region is further included in the analyses as indicated by Eurostat in 2020. Previous studies have commonly utilised the number of authorised patents as a proxy for innovation when measuring spillover effects (Levin et al., 1987; Mowery et al., 2001; Zucker et al., 1998).

The final two predictor variables measure company density on two levels. Firstly, the number of incumbent firms per capita is measured using companies that are older than five years in a given region per 1,000 citizens living in the region as of 2020.[3] The result is a quota that aims to operationalise firm density in a region. This measure is commonly used in entrepreneurial literature (see, e.g., Arych & Darcy, 2020; Mitic et al., 2018; Peter & Keil, 2013). The variable, start-ups, counts enterprise birth rates in each region between 2018 and 2020.

Location factors

To account for a potential regional bias and to determine migration patterns, a range of location variables were further constructed based on the location choices made by founders.

[3]The Eurostat database defines several milestones for the survival of a start-up and the categorisation of an incumbent firm. Taking the longest estimate, after five years, a company is no longer considered a start-up.

Location change indicates whether a founder has changed the location (>50km) between the previous employment or educational institution and founding location.

Change to small or large city are two dichotomous variables that indicate whether a founder has changed to either a small or large city upon the inception of the company. The city size is measured using the total number of citizens living in a city in 2020. As defined by the Cities in Europe Report (Dijkstra & Poelman, 2012), a small city in Europe is characterised by having a population of <50,000 citizens and a large city is defined as having a population of >250,000.

Changed country indicates whether the founder changed the country upon inception.

Distance (log) calculates the distance, in logged km, between the previous and the founding location.

Control variables

Several control variables that might impact green entrepreneurship were further taken into account. The likelihood of becoming a green entrepreneur is found to be influenced by a firm's age and country (Hockerts & Wüstenhagen, 2010; Pinkse & Groot, 2015); hence this study controlled for founding year and country, both dummy-coded (Coad et al., 2016; Shrivastava & Tamvada, 2019). Personal characteristics can also impact green entrepreneurial behaviour. Thus, demographic control variables were included in the analyses, namely age, gender, and education. As shown in Table A1, the founders included in this analysis are 45 years old on average, 75.9% are male, and 70% have at least an undergraduate degree. International venturing further varies across industries (Zahra, 1996). Thus, the analyses controlled for industry affiliations. Industries were categorised regardless of the green or non-green label. For instance,

a company can belong to the IT sector and also be categorised as either green or non-green. There are no green-only companies in the dataset. Lastly, following Giudici et al. (2019), the regression models control for population, GDP per capita, and employment rate at the country level, all of which were collected from the Eurostat database.

6.5 Results

The research hypotheses are tested in a two-stage process. In the first stage, a series of ANOVAs is conducted to assess whether a significant difference between green and non-green companies can be found. The results show that the percentage of green companies is significantly higher in areas with more funding, a higher number of universities per capita, higher educational level of the workforce, higher number of registered patents, as well as a higher number of incumbent companies and start-ups, $F(1, 4299) = 299.947$, $p < .001$, $\eta^2 = .065$, $F(1, 4299) = 49.679$, $p < .001$, $\eta^2 = .011$, $F(1, 4299) = 157.404$, $p < .001$, $\eta^2 = .035$, $F(1, 4299) = 222.662$, $p < .001$, $\eta^2 = .049$, $F(1, 4299) = 1876.189$, $p < .001$, $\eta^2 = .304$, $F(1, 4299) = 995.003$, $p < .001$, $\eta^2 = .188$, respectively. These results provide preliminary support for the hypotheses. To understand the magnitude of the effect, examine interaction effects, and account for possible confounding variables, several OLS regressions are conducted in the following part.

Table 6.2 shows the results of the OLS regression estimates. The DV in each model is green firm; a dummy-coded variable takes a value of one if the company is considered green and zero otherwise. Models OLS 1–4 entered the primary variables of interest to address the hypotheses, and the final model includes all variables of interest. Each model further added regional and economic control variables, namely GDP per capita, population, and employment rate, as well as the founder demographics of

Table 6.2: Location factors for green versus non-green start-ups.

	Models				
DV: Green firm	OLS-1	OLS-2	OLS-3	OLS-4	OLS-5
Gdp per capita	.049***	.070***	.086***	.029***	.017
	(.001)	(.001)	(.001)	(.001)	(.000)
Population	.215***	.232***	.223***	.027	.022
	(.001)	(.001)	(.001)	(.001)	(.001)
Employment	.067***	.063***	.087***	.084***	.064**
	(.653)	(.658)	(.685)	(.635)	(.677)
Funding	.088***				.087***
	(.001)				(.000)
University density		.063***			.097***
		(.001)			(.000)
Education		.059***			.142***
		(.001)			(.001)
Patents			.061***		.048**
			(.001)		(.000)
Incumbent firms				.237***	.231***
				(.001)	(.001)
Start-ups				.028**	.128***
				(.001)	(.001)
Demographics	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Founding year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Obs.	.131	.138	.128	.178	.198
R-sq.	4301	4301	4301	4301	4301

Note: All models include *green start-up* as the main dependent variable. The dummy-coded variable takes a value of *one* if the start-up produces a green product or service and *zero* otherwise. Before entering the main variables of interest, the models first enter *country*, *industry*, and *founding year* fixed effects as well as founder demographics gender, age, and education as control variables. Model (OLS-1) further enters the the number of green start-ups in a given region. The second model (OLS-2) enters the number of universities in a given region. Model (OLS-3) indicates the population density in a given region. Model (OLS-4) indicates how much green investment is provided in a given region. The final model enters all of the above mentioned variables. Each observation corresponds to a given start-up(i). All regressions use OLS. Significance noted as: p-value $< .10$ = *, p-value $< .05$ = **, p-value $< .01$ = ***.

gender, age, and education, as control variables. To account for trends that may be specific to the industry affiliation, the country in which the founder is located, and the year in which the company was founded, industry, country, and founding year fixed effects ($f_{Industry}$, $f_{Country}$, and $f_{Founding\,year}$) were also added.

The first variable of interest examined whether sustainable start-ups indicate a higher demand in funding compared to conventional firms. Model OLS-1 revealed

that funding positively predicts the number of green firms ($\beta = .088$, $SE = .001$, $p < .001$). Based on the log odds ratio, green start-ups are 8% more likely to locate in areas with more funding available than non-green start-ups. Thus, a higher amount of capital available in a given area has a favourable impact on the number of green businesses that are created there (Samila & Sorenson, 2011). This finding complements research hypothesising that green start-ups exert a higher dependency on external funding (Freudenreich et al., 2020).

The second model examined the importance of university density to find support for potential scientific and technical knowledge spillover effects. The first coefficient is positive and significant, thus supporting H2. In regional contexts, the presence of universities facilitates the formation of green start-ups. In other words, the more knowledge stock is available in local settings, the more green start-ups there will be. This confirms Lans and colleagues' (2014) theorising that higher education and green innovation may complement one another and provide the academic foundation for the establishment of sustainable start-ups.

The second variable entered in model OLS-2 is education. Beyond counting the percentage of academic institutions in the region as a proxy for fresh knowledge, this predictor aimed to detect the relevance of education in the workforce (i.e., amount of educated talent quantified by the individuals with at least a college degree) for the job market. Results show that the coefficient is strong in magnitude and positive at the 1% significance level. Notably, the education coefficient ($\beta = .059$, $SE = .001$, $p < .010$) is smaller than the university coefficient ($\beta = .063$, $SE = .001$, $p < .001$) in the individual model. However, when including all variables of interest in the final model (OLS-5), the magnitude and the significance of both predictors increased significantly. Interestingly, the education coefficient ($\beta = .130$, $SE = .142$, $p < .001$) becomes even stronger in magnitude than the university coefficient ($\beta = .097$, $SE = .001$, $p < .001$). In conclusion, strong support is found for the hypotheses H2 and H3.

These results support previous research that has acknowledged the roles of universities in knowledge spillover for sustainable (Wagner et al., 2021) and green companies (Demirel et al., 2019). Thus, results indicate a potential interdependency between available talent and location choices. It can be concluded that green firms choose locations with more talent, and in return more talent will be made available in areas with higher demand. The results on education are in line with current market research indicating that green enterprises have become increasingly attractive to younger and highly educated individuals as a result of rising awareness of climate change (Bin Magbool et al., 2016; Grigorescu et al., 2020; Sohn et al., 2015).

A second way of measuring the importance of technological spillover effects on sustainable start-ups is illustrated in model OLS-3. The number of patents registered in a region also positively predicts the creation of green firms. This suggests that the number of green start-ups in a given location positively relates to the local pool of technical knowledge measured in patents (H4).

For variables related to industry spillovers, results provide support for the hypothesis concerning the positive effect of the local density of existing organisations on green entrepreneurship (H5a). The local presence of established firms is a relevant determinant for the creation of green start-ups. In all estimates, the company-density variable is positive and significant at the 1% level. Interestingly, start-up density is found to be a positive but small predictor of green entrepreneurship ($\beta = .028$, $SE = .007$, $p < .05$) in model OLS-4 and a strong positive predictor ($\beta = .128$, $SE = .001$, $p < .001$) in model OLS-5. Thus, results provide evidence for the importance of start-ups in attracting green firms in a given geographical area (H5b). These findings indicate that green companies are more likely to emerge in areas with a diverse industrial network. Spillover effects and industry networks can impact entrepreneurial outcomes, thereby supporting the spatial agglomeration and hub formation theory. Furthermore,

existing start-up hubs or areas with a higher quota of other entrepreneurs positively affect the location choice of green entrepreneurs.

Lastly, in most models, the three control variables entered first positively predict the formation of green start-ups. Compared to conventional ventures, the number of sustainable firms appears to be higher in regions with higher GDP, higher population density, and lower unemployment. This indicates that green entrepreneurship is more likely to emerge in wealthier regions. However, it is notable that when entering all predictors, the employment rate becomes considerably lower in magnitude and population and GDP become non-significant. These results indicate that macroeconomic indices may help getting a rudimental understanding of the location choices of green entrepreneurs yet confound with factors that may be the actual cause for entrepreneurial behaviour. For instance, the positive and significant effect of being located in a highly populated region may imply that proximity to large urban agglomerates significantly increases the chances of creating a green start-up (Giudici et al., 2019). Given that population becomes insignificant in OLS-4, the model in which the company and start-up density predictors were entered, indicates that the density of companies, particularly start-ups, plays a more substantial role than population density.

Together, these results provide suggestive evidence of a robust relationship between location factors and green start-ups. The proximity to and the number of universities in the region as an indicator of a potential scientific knowledge spillover depicts a positive and statistically significant effect on green start-ups. This is supported by the connection between the number of patents registered on the likelihood of a green technological entry. Access to funding and educated talent further present a favourable location factor for green start-ups. Lastly, the positive and significant effect of both start-ups and established companies indicates that a diverse and dense industry network incentives green entrepreneurs to set up their firms in such an environment.

6.5.1 Location choices amongst green entrepreneurs

Reflecting on the results, it would be reasonable to infer that more green start-ups are located in metropolitan or urban regions as these regions are typically associated with more funding, universities, and talent available (Florida, 2006). However, does this mean that rural legislators are inherently inferior in attracting green entrepreneurs?

Taking funding, for example, a number of studies have proposed that green companies are located in areas where there is more funding available, whether this is at a national (Demirel et al., 2019) or regional (Mrkajic et al., 2019) level, which emphasises the role of financial incentives in location choices. A follow-up question that emerges from the first regression analysis is whether funding is the panacea for stimulating green entrepreneurship, as it is often assumed by legislative bodies, and more importantly what location factors motivate sustainable founders to forgo better funding opportunities in a certain region and instead establish the company in a rural geographical area. To provide more nuanced insights on the role funding plays in firm creation, the following analysis examines the distinct location patterns and illustrates the conditions under which green start-ups potentially forego funding opportunities for other location benefits.

Table 6.3 examines the likelihood that founders of green start-ups change their location upon establishing a company and, if so, what location they choose. Each observation corresponds to a given start-up$_i$. The DVs Y_i represent the location choices. The first model examines the dummy-coded variable location change, indicating whether a founder has changed the location (>50 km) upon inception. Models OLS-2 and OLS-3 further split the group and examine whether those who did change chose a small or large city to found in. Having firms from over 20 countries also allows for investigating who changed the country upon inception, which is measured in OLS-4. To account for the close regional proximity of countries in Europe compared to countries

Table 6.3: Location choices among sustainable founders.

	Models				
	OLS-1 Location change	OLS-2 Changed to small city	OLS-3 Changed to metropolis	OLS-4 Changed country	OLS-5 Distance (log)
Green start-up	.045***	–.156***	.202***	.085***	–.078***
	(.015)	(.012)	(.012)	(.011)	(.075)
Demographics	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Founding year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Obs.	4301	4301	4301	4301	4301
R-sq.	.163	.141	.108	.040	.036

Note: Model OLS-1 examines whether a person has changed the location (of >50km) to set up the company. The outcome in model OLS-2 is a dummy-coded variable that equals one if the founder has moved to a small city to establish the company and zero otherwise. Model OLS-3 indicates whether a founder has moved to a metropolis to establish the new company. Model OLS-4 indicates whether the founder has change the country to found the company. The outcome in model OLS-5 measures the actual distance in km between the previous and the current company location. Country, founding year, and industry fixed effects as well as founder demographics are added. Standard errors are clustered at the country level and are represented in parentheses. All regressions use OLS. Significance noted as: p-value $< .10$ = *, p-value $< .05$ = **, p-value $< .01$ = ***.

with larger geographical areas, such as China or the US, another perspective is added to location choices by examining the distance (in km) between the previous and current employment locations in model OLS-5. Given the skewed distribution of distances, this variable is log-transformed. All models entered green firm as the primary predictor and included the same control variables and fixed effects as used in Table 6.2

Overall, founders of green start-ups are about 13% more likely to change their location upon inception compared to non-green entrepreneurs ($\beta = .045$, $SE = .015$, $p < .001$, model 1). Of the 2,336 non-green founders, 729 (31.21%) decided to change their location as opposed to 883 (44.94%) of the 1,965 green founders. Amongst those who changed, the coefficient for changes to large cities is strong in magnitude, positive, and significant at the 1% level. This indicates that green founders are more attracted to metropolises than non-green founders. Changes to small cities are equally significant yet the coefficient is negative, indicating that green founders are less likely to establish their firms in a small city. Amongst the green founders who changed their

location, 611 (69.20%) chose a large and 272 (30.80%) chose a small city. Thus, large cities are the preferred founding location for green start-ups. Green entrepreneurs are also more likely to change the country upon inception but tend to move smaller distances.

These results support the argument put forward by Tien et al. (2020), who propose that rural areas are at a disadvantage when it comes to attracting sustainable entrepreneurs. In contrast, the overall flexibility to change the location indicates that green start-ups are less bound to a particular region and potentially make their location choices deliberately, which is a good indicator for rural legislators. Thus, it is interesting to examine what factors potentially motivate or discourage a founder from setting up a new firm in a rural area.

The third regression analysis includes all predictors introduced in Table 6.2 in an attempt to identify rural location choices and derive potential policy implications. The DVs are the location choices, similar to Table 6.3. Contrary to previous models that focus on the distinction between green and non-green firms, Table 6.4 focuses only on green start-ups. All coefficients were entered in the same model to control multicollinearity amongst the predictors. The same control variables, demographics, and fixed effects were entered.

Model OLS-1 examines the founder's willingness to change the founding location. Amongst green founders, higher funding, university density, patents registered, and the number of companies per capita all positively predict location changes. This again supports the notion that green founders are not indifferent to their chosen location and that several factors can influence migration patterns.

Of those who changed their location (OLS-2), the number of universities, the technological output (i.e., patents), and the incumbent firm density appear to be significant and positive predictors of stimulating changes to rural areas. Notably, neither

Table 6.4: Location choices among sustainable founders.

	Models				
Filter: Green only	OLS-1 Location change	OLS-2 Changed to small city	OLS-3 Changed to metropolis	OLS-4 Changed country	OLS-5 Distance (log)
Funding	.123***	–.021	.148***	.053*	.086***
	(.001)	(.001)	(.001)	(.002)	(.001)
Universities	.078***	.113***	–.001	.022	.075***
	(.001)	(.001)	(.001)	(.001)	(.004)
Education	–.020	.021	–.037	–.021	.003
	(.000)	(.001)	(.000)	(.000)	(.000)
Patents per capita	.337***	.078**	.305***	.234***	.331***
	(.000)	(.000)	(.000)	(.000)	(.000)
Firm density	.112***	.141***	.016	.120***	.123***
	(.001)	(.001)	(.001)	(.001)	(.001)
Start-up density	.032	–.037	.062*	–.044	–.001
	(.001)	(.001)	(.001)	(.001)	(.000)
Demographics	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Founding year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Obs.	1965	1965	1965	1965	1965
R-sq.	.140	.079	.082	.047	.093

Note: Each observation corresponds to a given start-up$_i$. Only green start-ups are included in the analysis. IVs are similar to Table 6.2. Founder demographics (gender, age, and education) as well as country, founding year, and industry fixed effects are included in all models. Standard errors are clustered at the country level and are represented in parentheses. All regressions use OLS. Significance noted as: p-value $< .10$ = *, p-value $< .05$ = **, p-value $< .01$ = ***.

start-up density nor funding positively predict changes to small cities, potentially indicating the futility of such location factors. Instead, a rural area attracts green founders with high technological output and a strong network of universities and incumbent firms.

Interestingly, metropolises reveal a somewhat different outcome. Green entrepreneurs are stimulated to set up their companies in urban areas when funding, patent output, and start-up density are high. Increased funding may only be relevant for urban areas as operational costs are generally higher in larger cities thus incentivising founders to move when financial support is given. Additionally, higher start-up density

may highlight the importance of start-up hubs and communities, often found in larger cities, to motivate green founders to choose an urban environment.

Separating small and large city founders reveals several important nuances in the migration patterns of green entrepreneurs, which policymakers can consider when designing a legislative strategy to attract founders. In summary, technological output, measured by the number of patents registered in a region, is a strong positive predictor of attracting green founders regardless of the city or country size. While patents may be considered a proxy for the technological advancement of a region rather than a direct factor considered by entrepreneurs, it supports the assumption that green firms are keen to settle down where innovation is thriving.

Additionally, rural areas are not at a disadvantage per se. In fact, a significant number of green founders chose small cities over metropolitan areas, potentially based on an extensive university infrastructure and company network. This result sheds light on the fact that some green founders might value quality over quantity. More specifically, while urban regions often offer better funding opportunities, more universities, and more educated talent, the results of OLS-2 imply that some rural areas may be specialised in a particular technology or sector, which constitutes an attractive location factor.

Lastly, while funding can incentivise a location change, it only attracts urban founders. Since this coefficient is non-significant rather than negative for rural founders, funding can be considered a non-essential factor. This result has two interpretations: Either rural areas are less attractive, despite having higher funding opportunities, or green entrepreneurs potentially forego better funding opportunities in urban areas and instead emphasise academic and professional networks when deciding to found in rural areas.

6.5.2 Location choices based on industry affiliations

The last section of the analysis focuses on location choices across industries. Four location choices are entered as DVs. The primary predictors are green firm and industry affiliation. Two distinct industries were chosen to determine potential sector-specific preferences: IT and manufacturing. The rationale for choosing these two industries lies in the nature of their business model and the required resources to establish their business. When establishing a new company, most industries share a similar set of tangible and intangible resource requirements. Comparing a sustainable restaurant versus a sustainable fashion retailer, for instance, both companies need to acquire start-up capital, pay for a storefront, and hire talent (Dahl & Sorenson, 2009). However, the two industries chosen in this study can be found on two opposite sides of the spectrum of the required resources. Specifically, IT companies are typically characterised by having little to no inception costs (Parnell et al., 2000). Most resources needed to operate the business such as servers can be outsourced and talent can be hired gradually. In contrast, manufacturing companies often need to purchase a number of machines and typically need more space for production. Consequently, these two industries were chosen to detect differences between two opposite industries. The same set of controls and fixed effects were used. Due to the industry focus of this analysis, industry fixed effects ($f_{Industry}$) were excluded from the following models.

Table 6.5 joins ranks with previous findings showing that green founders are more likely to change their location. Moreover, green founders again show a higher tendency to move to large cities and a lower tendency to settle down in smaller cities compared to other founders. Founders working in the IT sector are more likely to found locally (i.e., not change their location upon inception), $\beta = –.131$, $SE = .043$, $p < .001$, compared to other industries. Furthermore, IT founders are less likely to change to small cities. Interestingly, results indicate a negative interaction between being green and working in the IT sector on changing the location ($\beta = –.048$, $SE =$

Table 6.5: Location choices by industry.

	Location change		Changed to small city		Changed to metropolis		Changed country	
Model	OLS-1a	OLS-1b	OLS-2a	OLS-2b	OLS-3a	OLS-3b	OLS-4a	OLS-4b
Green firm	.075***	.062***	–.143***	–.128***	.226***	.197***	.099***	.102***
	(.015)	(.016)	(.013)	(.013)	(.013)	(.013)	(.011)	(.012)
IT	–.131***		–.178***		–.003		–.093***	
	(.032)		(.026)		(.028)		(.024)	
Green firm × IT	–.048***		.014		.071***		–.013	
	(.041)		(.033)		(.035)		(.030)	
Manufacturing		.104***		.139***		–.005		.070***
		(.027)		(.022)		(.023)		(.020)
Green firm × manufacturing		.048**		–.085***		.022		–.050**
		(.039)		(.032)		(.033)		(.029)
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Founding year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	4301	4301	4301	4301	4301	4301	4301	4301
R-sq.	.156	.136	.091	.080	.098	.093	.035	.028

Note: The same location outcomes as those described in Table 6.3. Green firm is an indicator that equals one if the firm produces sustainable products or services and zero otherwise. The variable IT is dummy-coded and indicates whether firm is affiliated to the IT sector. Manufacturing indicates whether firm is affiliated to the manufacturing industry. The same set of controls and fixed effects are used, excluding industry fixed effects. Standard errors are clustered at the country level and are represented in parentheses. All regressions use OLS. Significance noted as: p-value < .10 = *, p-value < .05 = **, p-value < .01 = ***.

.041, $p < .001$). Working in the sustainable IT industry makes founders stay in their current location thus reducing the tendency of green founders to change their location. Descriptive statistics indicate that 29.44% of green founders in the IT industry are willing to change, as opposed to 25.35% of non-green founders in the IT industry. A positive interaction on changes to large cities indicates that the preference of green founders to choose larger cities can be amplified when these founders are also working in the IT industry.

Founders in the second industry of interest, manufacturing, are more likely to change their location ($\beta = .104$, $SE = .027$, $p < .001$). The positive interaction between being a green founder and working in the manufacturing industry underlines their similarity and indicates that sustainable manufacturing founders are even more likely to change their location than green founders in other industries. Notably, the negative interaction between being green and working in the manufacturing industry on changes to small cities ($\beta = –.085$, $SE = .032$, $p < .001$) shows that the location preferences of green founders can be significantly influenced by industry affiliation. In this case, green founders are more likely to change to smaller cities when working in the manufacturing industry.

Taken together, the results reveal several important insights into the location choices of sustainable entrepreneurs. While green founders generally prefer to change their location, those working in the IT industry prefer to stay local. In contrast, sustainable manufacturing founders are even more likely to change than average green entrepreneurs. Moreover, green founders' low preference for rural areas can be reversed when founders work in the manufacturing industry and reinforced when working in the IT sector.

There are several potential explanations for these findings. Firstly, IT start-ups often have lower founding costs than companies in the manufacturing industry

(Butler et al., 2020). For instance, internet companies usually have much lower infrastructure demands like machines and can deploy resources remotely (Ross & Blumenstein, 2015). As a result, IT founders are more flexible in choosing a location and can literally set up the company from the garage or home office. Secondly, technology start-ups are often founded during the time a founder is at university (Roche et al., 2020), resulting in a lower percentage of location changes. For manufacturing firms, however, higher change rates may be explained by the fact that production generally takes place in areas that cater to the industrial output, for example, by providing low-cost industrial spaces, lower average salaries for workers, and a specialised pool of skilled but not necessarily highly-educated workers (Zhang, 2020). The likelihood of having ideal production conditions in the founder's current region is relatively low, potentially explaining the higher change rate. Thus, IT entrepreneurs have more freedom in their location choice for new ventures than those depending on tangible resources.

In summary, sector-specific orientation in green entrepreneurship is not universal. Results show significant interaction effects between two fundamentally different industries: Green manufacturing and green IT.

6.6 Discussion

Today, it is unclear what role regional clusters play in stimulating sustainable entrepreneurship. Several researchers highlight the increasing demand for research on the interactions between green ventures, industries, governments, universities, and NGOs in order to guide them to work together more effectively, resolve pressing environmental issues in the long term, and develop necessary technologies in a competitive way (Demirel et al., 2019; Farinelli et al., 2011; Muo & Azeez, 2019). However, in the current literature, the relation between sustainable development and entrepreneur-

ship is mostly prescriptive rather than descriptive and exceedingly optimistic (Hall et al., 2010). As a result, it is unclear to what extent entrepreneurs can contribute to the transition towards a greener economy, how they are motivated and incentivised, whether there are structural barriers to sustainable ventures capturing economic rents, and whether sustainability-oriented entrepreneurs differ from traditional entrepreneurs. More studies are needed to gain a better understanding of the impact of public policy and how it might influence the occurrence of sustainable entrepreneurship (Hall et al., 2010).

This study emphasises the importance of both academic and industrial spillovers in attracting sustainable entrepreneurs. It was hypothesised that besides funding, green firms indicate a higher demand for industry collaborations, exchange with research institutes, and integration into existing start-up communities. As a result, spillover effects are expected to go beyond scientific and academic knowledge originating from universities and equally spill over from incumbent firms close to the green venture. This research provides an important nuance to rural green entrepreneurship and the development of sustainable technological clusters through the lens of spillover theory.

Results show that most green start-ups prefer to locate in urban regions. However, rural areas are not at a disadvantage per se. In fact, green founders value different location factors depending on whether they choose a small or large city to set up their business. A high number of universities motivate a location change and specifically encourage green founders to move to a rural area. Building on the previously discussed hub formation, it is probable that green founders are specifically searching for technological or sector-specific clusters to which they are willing to move despite their general preference for urban areas. Across Europe, specialised universities and research institutes are often found in non-metropolitan areas. For instance, the Fraunhofer organisation, one of the primary industry research institutes in Germany,

has offices across 83 locations, and only eight of them are located in larger cities (Fraunhofer Institute, 2022).

Moreover, while funding and start-up networks are the important predictors of urban founders, rural areas can equally attract sustainable entrepreneurs when the technological output is high and the region has a strong network of universities and incumbent firms. This presents an opportunity for rural legislators to determine their focus in designing legislative agendas when firm networks, number of universities, and technological output are high. As a result, the formation of high-tech or sector-specific hubs gains importance due to this result.

Lastly, the migration tendencies of green founders can either be enforced or reversed depending on the industry subsector. The preference for larger cities is even higher when green founders work in the IT industry. However, entrepreneurs working in green manufacturing are more likely to establish the firm in rural areas, contrary to the general aversion to such locations.

6.6.1 Theoretical implications

This study adds to the theoretical literature in several ways. Firstly, the current findings highlight the importance of knowledge spillover theory. As green enterprises can be considered a subset of technology-based start-ups (Bjornali & Ellingsen, 2014), results extend our understanding of the theory by showing that the availability of university knowledge in close proximity has a positive impact on the number of green start-ups in a given region. In a nutshell, sustainable start-ups have an above-average demand for technological expertise, funding, and talent. Areas with a tight network of academic institutions and industry experts increase the likelihood that sustainable firms settle down and eventually form a hub.

Results also support the recombinant knowledge hypothesis (Antonelli et al., 2010), which states that information is derived through the availability of a variety of distinct types of regional knowledge. Congruent with previous studies (Scott et al., 1995; Zhao et al., 2021), the results of this study deliver strong evidence that knowledge is multi-dimensional. To date, this study is amongst the first that holistically extend knowledge spillover theory to sustainable entrepreneurship. This is particularly important for advocates of spillover theory as green start-ups are not only a critical research domain but, as shown throughout this chapter, face several unique challenges compared to conventional start-ups. Understanding how different facets of knowledge spillover, namely academic knowledge, marketable knowledge, and industry knowledge, favour the formation and migration of green entrepreneurs therefore provides important extensions to our current understanding of how knowledge networks are formed and transferred.

Furthermore, this chapter adds to research in spatial economics that explains that location preferences are made by optimisation behaviour that involves either minimising the costs of moving inputs and outputs or minimising the production costs (including wages and capital), which results in maximising potential profit (Capello, 2014). Thus, it can be concluded that the decision of where to create a start-up is influenced by a location's ability to reduce costs, generate growth signals, and acquire key resources, amongst other factors. This research provides an essential contribution to this notion as founders in different industries vary in their location preferences. Access to knowledge, innovative technology, and high-quality talent – typically found at a higher rate in metropolitan regions – is central in choosing a founding location for IT entrepreneurs. Nonetheless, manufacturing start-ups are often characterised by high operating costs, making cost reduction a key location factor.

Lastly, this chapter advances our knowledge on aggregated metropolitan economic indicators as well as individual-level factors in examining individual location

choices (Butler et al., 2020; Dahl & Sorenson, 2009; Figueiredo et al., 2002) and is amongst the first to transfer the idea of green entrepreneurship to the local level across a range of different industries and different European countries.

6.6.2 Practical implications

Policymakers and society as a whole are becoming increasingly concerned about the mounting environmental ramifications (OECD, 2015). Green start-ups have the potential to contribute to long-term technological advancement and to lead the transition towards a green economy (Zoboli et al., 2014). Thus, understanding what factors foster the establishment of pro-environmental firms is critical to practitioners and policymakers.

Sustainable start-ups, as well as sustainable firms in general, exhibit significant differences compared to conventional companies. As a result, traditional policy approaches may not suffice when aiming to attract green entrepreneurs, and especially rural areas often struggle to provide favourable infrastructure to attract those firms. The primary goal of this chapter is to outline the challenges faced by sustainable ventures to raise awareness for a reconsideration of policy priorities, both in the EU and abroad, and provide educated implications for sustainability communication and legislative development.

In revealing what local factors foster green entrepreneurship, this chapter addresses and integrates two research issues that to date have received limited attention: Where green start-ups are created and what factors encourage the formation of sustainability clusters. Thus, this study offers important insights for understanding the paths of transition to the green economy.

One of the most important levers that policymakers can employ to stimulate local development is increasing local networks (Colombelli, 2016). As knowledge

spillovers from universities enhance the creation of innovative green start-ups in regional contexts, policymakers are advised to strengthen academic networks and offer opportunities for founders to interact with researchers. An important contribution found in this study shows that spillover effects can go beyond scientific and academic knowledge originating from universities and can equally spill over from incumbent firms close to the green venture. Therefore, this study provides practical implications that can aid policymakers in determining how and under what conditions established organisations in a region can be leveraged to foster strategic collaborations with green start-ups.

This research can also assist supranational governing bodies. The EU, which is in the centre of this study, allocates funding to different regions to advance innovation and entrepreneurship and promote the shift towards a greener society. Critically, results indicate that external funding is not the only factor in attracting green entrepreneurs. In fact, sustainable founders in rural areas are not attracted by funding and instead value science–industry connections. Rather than making funding available directly to founders, legislators in these less-populated areas can, for instance, use grants to enhance the knowledge exchange between academic institutions and green firms by organising local events such as innovation summits or by inviting more incumbent organisations to scientific conferences.

Moreover, the perception of the sustainability industry may be more complex than often assumed (Porter & Derry, 2012). This study shows that green founders can follow opposite migration patterns depending on their industry affiliation. For example, the higher willingness of sustainable manufacturing founders to move can prompt policymakers to look beyond regional borders and even potentially attract founders from other countries. Marketing efforts and regional branding should be conducted on a national rather than provincial level. Additionally, since founders in the IT industry tend to establish their companies locally, the transition from university

to the industry and the barriers upon registration should be made as effortless as possible; policymakers can consider establishing entrepreneurial courses for technical PhD students to close the gap between scientific research and industry entrants. This can also prevent talent from leaving a particular region and contribute to forming a technology hub.

6.6.3 Limitations and future research

This chapter offers important insights into how complementing policy initiatives at the regional levels might assist the creation of new European laws. However, additional studies are needed to assess the efficacy of the European policy to stimulate the development of green start-ups and determine if the new policies will be sustained over time. Furthermore, this study focuses on European countries due to their high environmental performance and entrepreneurial culture. This is intended to catalyse insights and derive a managerial road map for other regions and legislators. However, it would be fruitful to apply the findings in regions with lower environmental or entrepreneurial advocacy. Specifically, this study invites researchers from other continents, such as Africa or Asia, to build on the experimental framework and extend results cross-culturally.

While the breath of data allows for covering a wide range of demographics and regional differences, it also constrains the inclusion of specific policy measures since not all regions publish government spending and funding data made available specifically to sustainability start-ups. Detailed information concerning the environmental policies issued at the regional and provincial levels would be beneficial for future research. In addition, this study only considered the industry affiliation to characterise green start-ups. Future studies should consider adding performance measures to examine which locations provide an ideal breeding ground for the success of green ventures as well as their environmental outcome (Branzei et al., 2004).

Lastly, this research introduces a foundation for additional case studies or detailed investigations into the relationships between green start-ups and universities or research institutions. By linking spillover theory with green entrepreneurship on a theoretical level and providing evidence on the importance of universities for the establishment of green firms, future research might consider taking a deeper look at the form and extent of their relationship (e.g., by assessing joint research projects and collaboration contracts). Thus, future studies could take the results and design case studies or qualitative interviews to verify the notions derived in this research.

6.7 Conclusion

Entrepreneurship is frequently considered unsustainable (Lans et al., 2014), diminishing its capacity to contribute to and provide answers for long-term regional development. Combining the two theories helps researchers and policymakers consider green entrepreneurship a fruitful yet complicated source of business opportunity. Finding solutions for rural areas' development requires an understanding of the motivation of green entrepreneurs and environmental factors that can benefit a firm success.

Research from European regions reveals that local knowledge spillovers can explain the agglomeration of green start-ups but does not provide a panacea for all green start-ups. The fact that founders' career histories and industry affiliation determine, at least in part, the location chosen for the firm inception, specifically in some cases away from typical hubs, shows the versatility of founder decisions.

7 | General discussion

The final chapter brings this thesis to a close by describing how the four empirical studies address the central research question. It considers the doctoral project as a whole, with a specific focus on the theoretical and practical contributions it makes to the scientific discourse and political sphere. The general discussion does not reiterate the arguments outlined in the previous chapters, but rather presents the dissertation's main contributions and lessons learned about corporate sustainability and the role that sustainable communication plays in effectively shaping organisational environmental advocacy. The goal of this final chapter is to translate the key results into a comprehensive communication framework and answer the central question of how organisations can achieve legitimate environmental advocacy through corporate sustainability communications. The chapter closes with a description of the limitations of the thesis and future research directions.

7.1 Motivations and objectives of the thesis

Only about 100 companies are responsible for two-thirds of global carbon emissions (Riley, 2017), and yet, as recently as 2009, only around 2% of research on pro-environmental behaviour was conducted in organisational settings (Davis & Challenger, 2009). With the planet moving towards irreversible environmental damages, it becomes

clear that organisations play a key role in both causing and fighting climate change and that there are still considerable gaps in the corporate sustainability literature. Understanding corporate sustainability is crucial in the transition towards a sustainable society (Leal et al., 2016).

This research pursued due to a desire to make sense of corporate communication and provide a comprehensive behavioural framework for genuine climate change advocacy in organisational contexts. The motivation for this theme lies in the dissonance between organisations taking a genuine environmental stance versus those who adopt a symbolic or selective ceremonial conformity. A wide range of communication tactics employed in the field (such as greenwashing or symbolic hiring decisions) has sparked a debate on how to detect illegitimate marketing practices (e.g., Garcia & Greenwood, 2015; Guo et al., 2017; Olsen et al., 2014).

To address this debate, the studies in this thesis centre around environmental leadership across a wide range of organisations, discuss the opportunities offered by different communication strategies and provide a roadmap for their implementation. Together the chapters make a compelling case that large-scale organisational change is not only necessary but also imminently possible. This thesis showcases that a holistic approach to understanding corporate sustainability communication can help transcend unsustainable dichotomies perpetuated in organisational literature in which primarily hypothetical delineations fail to explain the methods and practices applied in the field.

In more concrete terms, this final chapter accumulates the results from the individual chapters and channels them into a comprehensive communication framework aimed at providing both organisational scholars and business leaders with a theoretical roadmap of effective corporate sustainability communication across different levels of stakeholder interactions. By bringing these various threads together, these papers contribute to our understanding of contemporary corporate sustainability, particularly

focussing on the role of legitimacy in environmental leadership and sustainability communication. Throughout this dissertation, both the moral and strategic imperatives for corporate sustainability efforts are examined theoretically and empirically to investigate the role of legitimacy in corporate sustainability communication. This thesis showcases that genuine environmental advocacy requires effective leadership and governance at the national, regional, and local levels. Thus, a holistic approach to understanding sustainable organisations that considers the triangular relationship between the internal stakeholder, external stakeholder, and socio-cultural factors is needed.

7.2 Summary of findings and development of a comprehensive communication framework

This thesis began by exploring the origins of corporate sustainability. Since its first conceptualisations in the 1700s, the concept of sustainability has evolved significantly. Over the last two decades, organisational climate change and corporate sustainability research have gained significant attention (Siew, 2015).

To sort through the increasing number of publications and provide a conceptual and theoretical foundation, chapter 2 lays out the theoretical basis for the empirical chapters. Specifically, the literature review shows that emotional and societal issues – such as climate change – require organisations to obtain legitimacy in their communication practices. Based on the guiding principles of net yields, triple bottom line, and ESG, chapter 2 thus canvasses the topic of legitimacy in sustainability communication. It reviews the corporate sustainability and communication literature and highlights that different paradigms and approaches exist to understand the legitimacy of sustainability claims. It was outlined that conventional theoretical rationales, logic, and practices have played a pivotal role in establishing the ideological framework that

legitimises the compilation of corporate activities that have led to the current understanding of sustainability transformations. This is especially relevant in organisational contexts, with large companies being the main catalyst for environmental outcomes – both positive and negative.

Critically, however, most models examining legitimacy in environmental communication remain disconnected from each other (Wahlberg, 2001). In fact, the diversity and ambiguity around the term 'legitimacy' have resulted in various definitions and applications in the field (e.g., Amsler, 2009; Joseph, 2012; Lawton et al., 2000; Michelon et al., 2019; Van Bommel, 2014). While individual studies have made some valuable contributions (for recent reviews see, Opferkuch et al., 2021; Vieira Nunhes et al., 2021), this dissertation adds to the literature by showing that legitimacy theory has the potential to cut through the heterogeneity of climate change communication and by proposing an integrated communication framework of stakeholder interaction, where internal, external, and socio-cultural factors are merged to analyse and predict the advancement of corporate legitimacy. Reforming corporate communication is critical for attaining a holistic understanding of genuine environmental advocacy (O'Brien & Sygna, 2013). By featuring a visual theoretical summary of corporate sustainability communication from various angles, including emotions, leadership, talent attraction, and entrepreneurship, this thesis makes its first contribution to the literature.

A persistent theme throughout this thesis has been the notion that legitimacy in the context of corporate sustainability communication is complex, multi-faceted, and best understood by combining and integrating three key dimensions, namely; micro (e.g., internal stakeholders), meso (e.g., external stakeholders), and macro (e.g., socio-cultural) factors. Building on this, Figure 7.1 introduces a novel framework that synchronises the key results in this thesis. The model can be divided into four categories that vary between internal and external as well as direct and indirect communication. To verify the applicability and reach of a new framework, it is critical

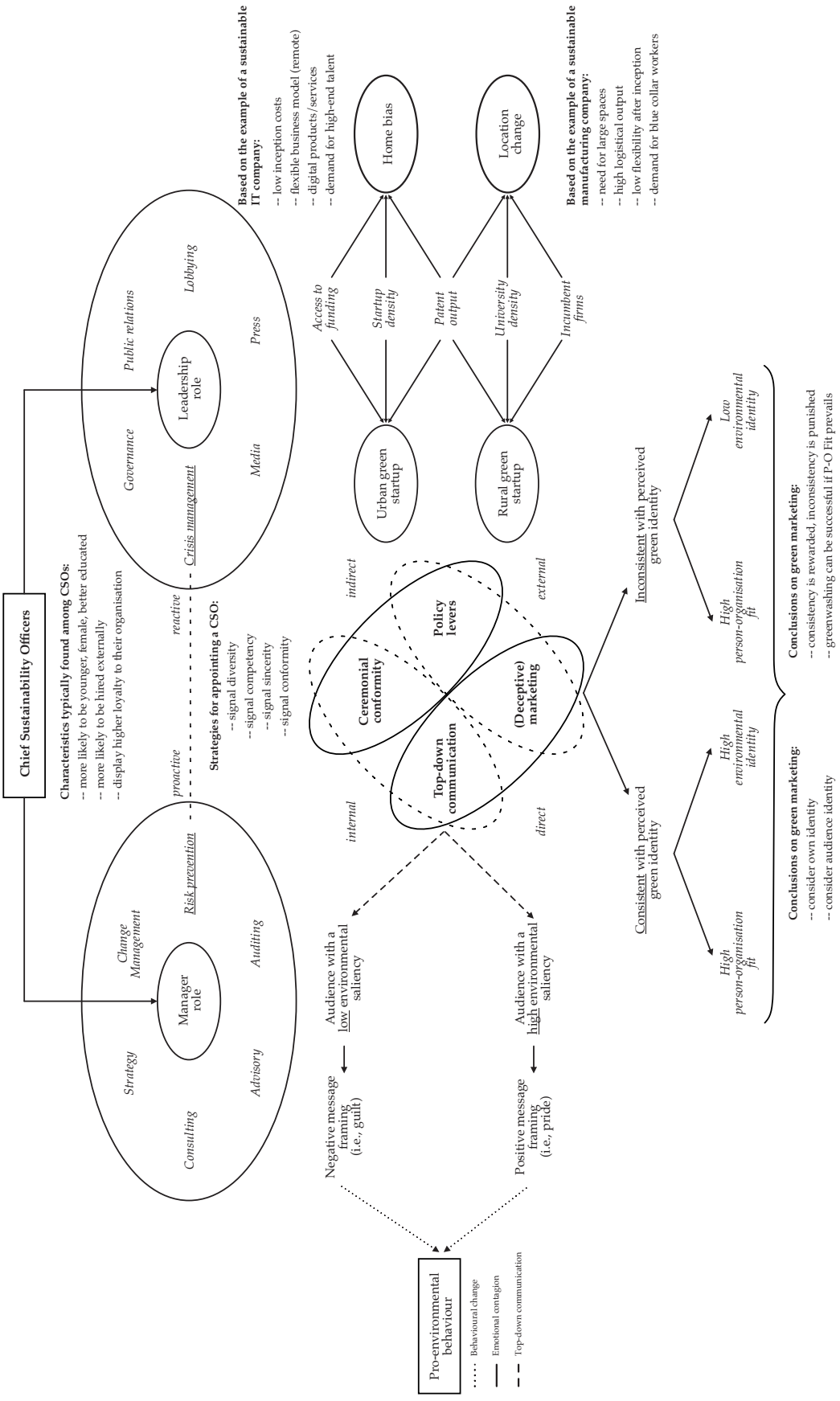

Figure 7.1: Communication framework.

to evaluate the theoretical and empirical evidence of previous models as well as their limitations (Van der Linden, 2016). Thus, the following subsections illustrate the contributions of each part of the model in detail and set the context for theoretical and practical contributions that legitimacy theory makes to the corporate-sustainability-communication and environmental-advocacy literature.

Merging the results into a comprehensive model has several objectives. Firstly, systematically varying between three levels of stakeholder interactions allows for advancing a more integrated and comprehensive understanding of climate change communication in organisations and as such likely increases the saliency of behavioural research in the mitigation debate, especially in light of a growing demand for more evidence-based public policy. Results aim to provide organisations and policymakers with practical tactics to raise genuine environmental advocacy and allow interventionists to design better targeted and more informed behavioural change campaigns. Secondly, the collective evidence presented in this thesis also enables broader conclusions about efforts to use legitimacy theory for more effective corporate sustainability communication. The framework presented in this thesis presents a unique and theoretically cohesive explanatory assessment of how these factors are conceptually associated across a variety of communication techniques. Ultimately, this section evaluates the extent to which the central research question has been answered.

7.2.1 Contribution 1: The role of power and emotions

The first empirical contribution that this thesis makes is highlighting the role of power and emotions in corporate sustainability communications. The main results are illustrated on the left-hand side of Figure 7.1. Overall, the results provide evidence that power can be a useful tool in appealing to those people who are usually less driven to behave sustainably and that speakers should consider the expected environmental identity of the audience before designing a speech.

More specifically, study 1 explored how leaders and high-ranking individuals should design environmental campaigns and found that powerful individuals are more effective than low-level employees in encouraging organisational pro-environmental behaviour amongst the workforce. This finding is particularly interesting as it contradicts the notion that same-level peers (such as colleagues, family, and friends) are more effective in evoking environmental advocacy (e.g., Lin et al., 2016). Especially in corporate settings, the results highlight the importance of top-level leadership teams and top-down communication. The study is among the first to examine and elucidate the circumstances under which powerful individuals can encourage pro-environmental behaviour and thereby potentially lays the foundation to extend the findings to various types of environmental leaders in powerful positions, including academics, politicians, or non-government officials.

Besides power, the first study also measured the moderating effect of environmental identity, which allowed controlling for individuals who are generally less likely to act pro-environmentally. Not testing and controlling for a predisposition towards the environment is a common limitation of behavioural studies, despite the risk of not knowing whether an audience may already be prone to environmental conformity or may be inclined to disregard the impacts of climate change. Essentially, the results show that positive emotional narratives are more effective amongst audiences with high environmental identity, whereas negative emotional messages are better suited for recipients with a low identity. Demonstrating these different effects extends our understanding of emotion contagion and potentially allows for narrowing the often-found gap between intention and behaviour in the context of environmental psychology (Kollmuss & Agyeman, 2002).

7.2.2 Contribution 2: The role of CSO appointments

The second empirical study extends the concept of leadership and communication by focusing on a specific role in today's top-level leadership teams. One major contribution to the leadership literature and to the question of effective sustainability communication is the difference between the internal and external roles of a sustainability executive. Having insights into an extensive list of skills and making use of a novel machine learning algorithm makes it possible to conclude that organisations likely appoint a CSO for one of two purposes, either to improve internal structures and lead strategic transformations (e.g., by displaying strong advisory, consulting, and auditing skills) or to become the public face of the firm's sustainability efforts (e.g., by displaying strong PR, communication, and lobbying skills). One way this chapter tried to conceptualise this observation is by proposing a dichotomous distribution of skills and responsibilities by conceptualising the role of a CSO to be either a 'manager' or 'leader'. (See upper half in Figure 7.1).

Given the central role of legitimacy for this dissertation, the second study also illuminates the important yet understudied concept of symbolic versus substantial communication. Generally, the results are multi-faceted and do not allow for a black and white answer. On the one hand, results imply that organisations employ a CSO to signal conformity. This reasoning builds on the finding that CSOs display less leadership experience and lower tenure compared to other C-suite members, and many are primarily associated with communicative tasks, such as PR and marketing. On the other hand, the diversity of skills and the nuances found amongst executives accentuate the distinctiveness of the role and premeditation of hiring and selecting a CSO. This corroborates the argument that the hiring decision of a CSO is made deliberately and that the individuals working in this role serve a dedicated and warranted purpose. Overall, the diversity of skills needed and tasks associated with CSOs, as well as the tendency to look outside of a company to hire one, strongly suggest that conformity

to societal expectations may be an added benefit to the actual objectives of CSO appointments.

Study 2 also makes several methodological contributions. Contrary to the previous study, the second investigation takes a meso perspective by addressing both internal and external stakeholders related to the organisation. Moreover, the study follows a different theoretical foundation by building on signalling theory, a concept that revolves around 'indirect' communication. Moving away from experimental settings allows for a broad collection of variables, which in turn adds various nuances to the implications of symbolic communication. With over 10,000 executives and 86,000 individual skills, this study collected one of the largest sets of career data and hiring decisions of CSOs to date.

7.2.3 Contribution 3: The role of greenwashing

Chapter 5 takes symbolic communication one step further by examining deliberately deceptive marketing. In addition to mapping and validating the key determinants of genuine environmental advocacy via sustainability communication, another major contribution of this thesis is an initial effort to explore the deliberate attempts to deceive the public by knowingly presenting false information about a firm's environmental representation. Thus far, the literature has only considered genuine environmental advocacy in its effect on talent attraction (e.g., Chen, 2010; Lyon & Montgomery, 2015; Montgomery & Ramus, 2003), but no attempt has been made to explore how job seekers react to illegitimate or misleading information presented in job descriptions or whether they are potentially unable to detect the validity of such sustainability claims. Accordingly, the fifth chapter explores a pressing issue in sustainability research – greenwashing – as a common communication strategy to signal environmental conformity and extends the concept to the domains of recruitment and employer branding.

Under the theoretical umbrella of signalling theory, a contribution is made by illustrating that green recruiting messages can have different effects on job-pursuit intentions depending on the perceived organisational identity, environmental attitude, and organisational fit. When exposed to limited information about an employer (Waples & Brachle, 2020), job seekers actively search for cues to complete the company image. Critically, green marketing can have both positive and negative effects on a company's attractiveness to job seekers depending on the authenticity of their advertisements. Across all studies, the lowest attraction scores were found in the non-green company and green advertising conditions, indicating that candidates attribute a negative appraisal to prospective employers when firms are considered illegitimate. Notably, the study also detected situations when external stakeholders disregard the disingenuity of job advertisements (i.e., when P-O fit and identity interact). Results showed that (a) job seekers intentionally chose employers that are in line with their environmental attitude, (b) non-green ads are more effective amongst candidates with low attitude scores, and (c) job seekers can detect inauthentic green employer brands, resulting in even lower applications than neutral ads.

As indicated in the lower part of Figure 7.1, consistency in the perceived green image and marketing efforts is rewarded, regardless of the message recipient. Understanding these boundaries of deception puts legitimacy theory to the test by addressing how far companies can go in misleading their audience and whether external stakeholders can effectively detect greenwashing. The fact that greenwashing can have positive effects on talent attraction is an important contribution to the literature that generally assumes negative effects of misleading communication (Nyilasy et al., 2014) and advances our understanding of how to detect and combat deceitful organisations.

7.2.4 Contribution 4: The role of rural entrepreneurship

Studies 1-3 centre around the strategic use of sustainability communication from a corporate perspective. Chapter 6 inverts this view by investigating how legislators and regional policymakers can foster their environmental image to attract sustainable organisations. Rather than asking for hypothetical location choices (e.g., Simarasl et al., 2021), the data in the final study is gathered retrospectively. Thus, by working backwards to identify attractive location factors for green entrepreneurs, the results provide a wealth of insights into the determinants of sustainability hub migration.

Results from 4,300 companies across 21 European countries show that funding, number of universities, patents, start-up density, and incumbent firms all predict the agglomeration of green start-ups (see Figure 7.1, right-hand side). Interestingly, these location factors are not equally distributed across all green entrepreneurs. Depending on the industry that founders work in and, as a result, the products or services they offer, attraction varies. Green manufacturing companies, for example, are more likely to respond to university density and incumbent firms, whereas sustainable IT companies favour regions with high availability of funding and prominent start-up culture.

The research question is addressed by transferring the notion of spillover theory to sustainability communication and emphasising the interplay of location factors in helping legislators to attract sustainable entrepreneurs to locate in their respective regions. The determinants of green hub formation are likely to be a combination of different location factors. Thus, this thesis further contributes to the literature on economic agglomeration and hub formation by analysing actual sustainable entrepreneurship clustering (Christaller, 1966; Gaspar, 2018). Entrepreneurs can benefit from sectoral knowledge, practices, culture, and legislation, which leads to sub-sector clustering in sustainable entrepreneurship (Delgado et al., 2010; Porter,

1990). Additionally, when advertising their region as a favourable ground for green entrepreneurship, legislators should not emphasise one criterion (such as financial incentives via subsidies, tax cuts, or funding opportunities for green tech) but rather consider a combination of different policy levers.

7.3 Theoretical contributions

Besides the individual contributions each empirical chapter makes to the corporate sustainability discourse, this thesis as a whole also makes several theoretical contributions to the literature. First and foremost, it extends legitimacy theory. Empirically investigating the legitimacy of corporate sustainability claims aims to advance our understanding of symbolic climate change communication in organisations. Using legitimacy theory as the constant theoretical foundation is essential in providing a more comprehensive and systematic explanatory account of a wide range of corporate sustainability communications. It achieves this by investigating legitimacy on three levels. It highlights the different perceptions of sustainability campaigns depending on the proximal relationship between the stakeholder and the organisation. Effective sustainability claims should therefore incorporate all three (internal, external, and socio-cultural) spheres.

Beyond legitimacy theory, this thesis builds on and extends the classical communication theory of signalling, social psychology constructs (including identity theory, social hierarchy, power, and emotions), and economic and management concepts (including spillover theory and upper echelon theory). The intersection of management and behavioural sciences plays an essential role, for instance, by providing insights into how sustainability claims are perceived, behaviours are encouraged, organisational leaders make management decisions, and investigating how policies are designed, implemented, and evaluated. To obtain a holistic understanding of the relationship

between convincing communication, message framing, and legitimacy, on the one hand, and stimulating genuine environmental advocacy and actual pro-environmental behaviours, on the other, requires merging findings from a wide range of disciplines. In fact, integrated research can help filter, balance, and combine diverse findings from multiple domains thus creating new insights and improving our present conception of the topic (Van der Linden, 2014).

Moreover, the cultural differences mentioned in Chapter 2 and 3 have important implications for experimental field research on power dynamics in China. It is crucial to consider the role of collectivist values in shaping the perception and effectiveness of top-level leaders and same-level peers in promoting pro-environmental behaviour. According to the social identity theory (Tajfel & Turner, 1986), individuals tend to identify with and conform to the norms and values of their in-group members. In a collectivist society like China, this could mean that individuals are more inclined to adopt pro-environmental behaviours if they perceive such actions as being endorsed by their peers or group (Li et al., 2019). Another important theoretical consideration when studying power in China is the concept of guanxi, or social networks, based on reciprocal relationships and trust (Chen & Chen, 2004). Guanxi plays a critical role in shaping Chinese social interactions and may influence the effectiveness of top-level leaders and same-level peers in promoting pro-environmental behaviour. For example, individuals with strong guanxi ties may be more likely to comply with the expectations of their leaders or peers, regardless of their formal authority, because of the strong sense of obligation and loyalty inherent in these relationships (Yang, 1994).

The second contribution of this thesis revolves around the theme of symbolic conformity and deception. Sustainability communication was incorporated into the management literature soon after the conceptualisation of corporate sustainability (Verk et al., 2021). However, despite its four decades of academic history, most studies assume a general candour of environmental advocacy. In turn, disingenuous commu-

nication practices such as ceremonial conformity, decoupling, or greenwashing have been studied far less extensively (Donia et al., 2019; Marquis & Qian, 2014; Schons & Steinmeier, 2016; Walker & Wan, 2012). Consequently, disingenuous corporate sustainability communication – not least due to its complex and unethical nature – remains understudied (Collier & Esteban, 2007; Guerci et al., 2015; Hui, 2008). While many companies are enticed to display symbolic measures to position themselves as environmental advocates (e.g., DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Pfeffer, 1981), this dissertation accentuates the need to discuss and validate substantial policies to discern the genuine from the conforming approaches. Showing that modern organisations tend to hire specific executives with diverse skills complementing each other is one example of how the findings extend the existing literature on this issue. Despite there being a large number of theories and perspectives about general communicative practices, this thesis ventures beyond traditional communication approaches and situates itself at the intersection of genuine advocacy and symbolism.

This thesis also provides scholars with novel experimental methodologies to integrate behavioural investigations with economic metrics. The majority of behavioural studies on corporate sustainability communication thus far have been hypothetical, idiosyncratic, or intention-only (Moser, 2010; Steg & Vlek, 2009). Similarly, while there is currently no shortage of papers offering practical contributions to the field of corporate sustainability communication (e.g., Bai et al., 2015; Haywood et al., 2013; Lee, 2012; Siano et al., 2015), there is no systematic review of the theoretical and empirical discourse that explicitly investigates the legitimacy of corporate sustainability communication. Given the increasing public awareness of sustainability, managerial strategies and policies are often taken from industry publications, for instance, reports compiled by large management consultancies including McKinsey (2010), Deloitte (2021), or the Boston Consulting Group (2021) and financial institutions focussing on ESG reporting, such as Blackstone (2021), Goldman Sachs (2021), or Barclays (2021). From a practical standpoint, these reports prove their merits, yet scholars frequently

call for more behavioural, theory-driven approaches to corporate sustainability (Steg & Vlek, 2009; Van der Linden, 2014). This research provided both the theoretical examination and empirical investigation of legitimate corporate communication and thus helps merge behavioural science and corporate sustainability research.

On a related note, a central aim of this doctoral dissertation was to provide both scholars and practitioners with a methodological roadmap to create a bridge between behavioural research and managerial implications. Consequently, it is important to outline the several ways in which the papers in this thesis provide methodological contributions to their respective domain. The chapters provide a range of different methods, including experiments and field studies, database analyses, and machine learning analyses. For instance, this dissertation also provides behavioural researchers with a successful example of how more complex machine learning algorithms can be integrated to advance our understanding of human behaviour. To provide empirical yet practically significant implications, especially for managers and policymakers, it was important to recruit participants with strong industry backgrounds. Given the global impact of climate change and the likelihood that most strategic transformations extend beyond regional borders, the studies further contain populations from across the globe, with two studies conducted in China, one study focussing on the EU, and one study including participants from across the world.

7.4 Implications for policymakers

This thesis presents a business case for organisations to embrace environmental change while illustrating the challenges companies face and the opportunities that arise during this transition. Such a strategic transformation demands systemic change that extends well beyond symbolic actions, such as appointing a CSO or claiming to be a sustainable employer. The complexity surrounding strategic transformations found

particularly in chapters 3 and 4 underline that for most firms such a transformation entails senior leadership first articulating and shaping the organisation's objectives and purpose before moving on to strategy and implementation. Reconfiguring an organisation's DNA is an arduous and costly process (Karp, 2006). Exploring the impacts of leadership in the implementation of sustainability strategies provides several essential practical implications for organisational, political, or academic leaders. Thus, besides extending the theoretical discourse of corporate sustainability research, this dissertation also provides recommendations for individuals aiming to design environmental policies or encourage change amongst their constituencies. Several practical implications can be derived as follows:

a) *Effective communicators need the power, status, and resources to reach their respective audience.* As shown in study 1, powerful individuals are more effective in raising environmental awareness and behaviour amongst the workforce, and study 2 demonstrated that CSOs can foster strategic transformations not only because of their competence but also because they occupy high-ranking executive positions with sufficient authority. Thus, combining the theoretical advantages of powerful individuals with the hiring decisions of sustainability executives in the field demonstrates that establishing a formal senior executive role committed to managing the firm's environmental initiatives has a favourable influence on corporate environmental outcomes.

b) *Communicators should consider the environmental attitude of their audience.* Messages are received differently depending on the predispositions of the recipient (Holmes & Crocker, 1987). For instance, while power increased environmental behaviour across a wide range of participants, emotions showed significant differences depending on the environmental attitude of the audience. Policymakers and designers of environmental campaigns are advised to emphasise negative (e.g., guilt-inducing) emotions when they expect a critical or anti-environmental audience and use positive

(e.g., pride-inducing) emotions when the audience has a high environmental saliency. Moreover, when presenters and advocates of environmental policies expect an audience with rather low identification with the environment, the presenter's power is negligible. Policymakers are advised to consider the predisposition of their audience before designing environmental campaigns, as positive and negative emotions may have different effects.

c) *Communicators should consider their perceived identity.* By incorporating signalling and legitimacy theory into the policy discourse, this dissertation shows that organisations with genuine green identities should incorporate green messages into their recruitment campaigns as green identity and marketing interact to increase the number of applicants. On the contrary, companies who face higher public scrutiny about their environmental performance should be careful about promoting sustainability as stakeholders are keen to detect misleading communication. Simply put, consistency is rewarded, and inconsistency is punished.

d) *Communicators should consider their willingness to invest.* As shown in chapter 4, simply adding a sustainability officer to the board may not suffice to achieve a long-term outcome. The broad range of responsibilities associated with the role of a sustainability expert within an organisation highlights the diversity of subjects and challenges an organisation faces. Moreover, having an executive without the necessary support structure can automatically shift the executive from a substantial change agent to a symbolic representation of environmental efforts. In other words, substantive change requires considerable investment. Thus, CSOs should be accompanied by several sector-specific experts or mid-level managers that can carry out the implementation across different parts of an organisation. Importantly, not having a CSO in the leadership can cause a severe conflict of interest between core departments (operations or finance) and mid-level sustainability specialists. Since environmental initiatives are often intangible and costly (Eltayeb et al., 2011; Studer et al., 2006),

conventional chief executives without the necessary environmental background may favour traditional approaches over green initiatives (e.g., a COO who needs to weigh environmental demands and production efficiency).

e) *Communicators should consider stakeholder proximity.* If sustainability communication is primarily directed towards internal stakeholders, organisations are advised to incorporate sincere and measurable policies as employees and investors are likely to detect ceremonial actions. However, when aiming to create a favourable image outside of the company, symbolic actions may suffice. Since evaluations of external stakeholders are usually based on public information, the lack of performance data may be a cheaper and more effortless alternative, ethical and societal compliance notwithstanding. Chapter 2 outlines that external stakeholders may be unable to identify false claims correctly. Consequently, symbolic actions may be the cheaper option, at least in the short term. Yet, employing misleading communication has several caveats, such as loss of legitimacy amongst internal stakeholders. Building on this conundrum, companies are advised to thoroughly consider their intended core message and juxtapose it with current and anticipated stakeholder perceptions. The complex and multidimensional nature of sustainability perception suggests that public communicators should take an integrative approach; campaigns should not only cater to internal stakeholders such as employees but consider the role of media transparency and the long-term ramifications of image loss if the information is made public at some point.

7.5 Limitations and future directions

As with every academic study, this thesis also has several limitations. Similar to the previous sections, each chapter has already outlined the study-specific limitations

and future research directions. This section considers the research as a whole and aims to outline potential future research directions.

Firstly, several recent studies have stated that their limitations emerge due to low numbers of participants and location-specific constraints (e.g., Bin Magbool et al., 2016; Elijido-Ten et al., 2010; Ferreira et al., 2010; Wilmshurst & Frost, 2000). To make a significant contribution, most studies in this thesis consist of large-scale quantitative investigations aimed at reaching a high explanatory power and drawing conclusions across a wide spectrum of participants and contexts. Critically, this also leaves room for improvement as conclusions drawn from the data may be considered overly general or holistic and, at least in part, circumstantial. While the nature of these studies is explorative (i.e., allowing for a certain level of conjecture), it would be worthwhile to design and conduct in-depth investigations into the motives of a certain communication strategy. It would be interesting to investigate, for example, whether organisations use greenwashing with the clear intention to deceive job seekers or whether it is rather a relic of large organisations potentially not realising that they are misleading candidates. A second avenue for future studies is to conduct qualitative analyses or case studies to provide in-depth results that complement this thesis.

Secondly, the nature of deception limits the interpretability of some results. Especially for symbolic actions, it is difficult to distinguish between legitimate attempts and ceremonial conformity; and given the practical nature of field studies, it is most likely to be a combination of both objectives. It would be fruitful to conduct interviews with acting CSOs to get a first-hand account of their perception of the role and the tasks that they are associated with (i.e., whether they consider themselves as an integral part of shaping corporate strategy or rather serve a ceremonial purpose).

With two of the studies being conducted in China, there are several cultural limitations to consider when interpreting the findings, especially when attempting to

generalise the results to Western countries. In Chapter 3, for instance, China's unique cultural values and emphasis on authority, status, and collectivism, may have elevated the importance of power as a tool for behavioural change. In Western countries, on the other hand, individualism and egalitarianism are more prevalent, potentially lowering the effects of top-down communication. One potential reasons for the lower effect is the education systems in the West, which often encourage critical thinking, debate, and questioning of established norms (Paul & Elder, 2008). This approach to education may contribute to lower respect for authority, as individuals are trained to think independently and challenge traditional structures and beliefs. Thus, not being able to compare the results to Western populations limits the generalisability of the results.

Lastly, most studies in this thesis detect behavioural notions and communication effects without controlling for environmental performance. The primary focus for the investigations was to explore individual differences such as environmental attitude, emotions, identity, and firm perception rather than to test the actual performance, such as carbon footprint, environmental spending, or ESG valuations. Thus, it would be advantageous to combine environmental performance data with the communication strategies outlined in this dissertation. Specifically, future studies could design a longitudinal study that tests the effects of top-down communication and emotional narratives across different time frames (i.e., 3, 6, or 12 months). Scholars may also build on the skill matrix designed in chapter 4 and test the leader–manager concept across environmental or financial performance metrics. It would be interesting to see whether internal or external hires lead to better environmental outcomes and whether tenure and firm attachment mediate performance.

7.6 Conclusion

There is no doubt that corporations and organisational activity are responsible for the destruction of our planet. To promote regenerative corporate sustainability, there has to be a shift away from perceiving organisations as environments in and of themselves and towards understanding them as part of their socio-ecological systems. However, the complex nature of the subject often leads to policymakers failing to encourage environmental behaviour and organisations exploit the loopholes in environmental legislature. This doctoral dissertation provides a potential solution for this challenge by considering legitimate sustainability communication in organisational settings.

Appendices

Appendix A: Boolean search terms

CSO "Chief sustainability officer" OR "corporate sustainability officer" OR "vice president, sustainability" OR "vice president, corporate sustainability" OR "vice president, global sustainability" OR "vice president, sustainable development" OR "director of sustainability" OR "director of corporate sustainability" OR "director of global sustainability" OR "director of sustainable development"

Joint search ("Manager" OR "Chief" OR "President" OR "Vice President" OR "Leader" OR "Officer") AND ("CSO" OR "CSR" OR "corporate social responsibility officer" OR "corporate responsibility" OR "corporate sustainability officer" OR "Chief sustainability officer")

Sustainability terms "Green" OR "Environment" OR "sustainability" OR "sustainable" OR "CSR" OR "corporate social responsibility" OR "corporate responsibility" OR "corporate sustainability" OR "sustainability officer" OR "CR" OR "ESG" OR "EHS" OR "ESH"

Appendix B: Stop words

stop words = ["a", "about", "above", "across", "after", "again", "against", "all", "almost", "alone", "along", "already", "also", "although", "always", "among", "an", "and", "another", "any", "anybody", "anyone", "anything", "anywhere", "are", "area", "areas", "around", "as", "ask", "asked", "asking", "asks", "at", "away", "b", "back", "backed", "backing", "backs", "be", "became", "because", "become", "becomes", "been", "before", "began", "behind", "being", "beings", "best", "better", "between", "big", "both", "but", "by", "came", "can", "cannot", "case", "cases", "certain", "certainly", "clear", "clearly", "come", "could", "d", "did", "differ", "different", "differently", "do", "does", "done", "down", "down", "downed", "downing", "downs", "during", "e", "each", "early", "either", "end", "ended", "ending", "ends", "enough", "even", "evenly", "ever", "every", "everybody", "everyone", "everything", "everywhere", "f", "face", "faces", "fact", "facts", "far", "felt", "few", "find", "finds", "first", "for", "four", "from", "full", "fully", "further", "furthered", "furthering", "furthers", "g", "gave", "general", "generally", "get", "gets", "give", "given", "gives", "go", "going", "good", "goods", "got", "great", "greater", "greatest", "group", "grouped", "grouping", "groups", "h", "had", "has", "have", "having", "he", "her", "here", "herself", "high", "high", "high", "higher", "highest", "him", "himself", "his", "how", "however", "i", "if", "important", "in", "interest", "interested", "interesting", "interests", "into", "is", "it", "its", "itself", "j", "just", "k", "keep", "keeps", "kind", "knew", "know", "known", "knows", "l", "large", "largely", "last", "later", "latest", "least", "less", "let", "lets", "like", "likely", "long", "longer", "longest", "m", "made", "make", "making", "man", "many", "may", "me", "member", "members", "men", "might", "more", "most", "mostly", "mr", "mrs", "much", "must", "my", "myself", "n", "necessary", "need", "needed", "needing", "needs", "never", "new", "new", "newer", "newest", "next", "no", "nobody", "non", "noone", "not", "nothing", "now", "nowhere", "number", "numbers", "o", "of", "off", "often", "old", "older", "oldest", "on", "once", "one", "only", "open", "opened", "opening", "opens", "or",

"order", "ordered", "ordering", "orders", "other", "others", "our", "out", "over", "p", "part", "parted", "parting", "parts", "per", "perhaps", "place", "places", "point", "pointed", "pointing", "points", "possible", "present", "presented", "presenting", "presents", "problem", "problems", "put", "puts", "q", "quite", "rather", "really", "right", "right", "room", "rooms", "s", "said", "same", "saw", "say", "says", "second", "seconds", "see", "seem", "seemed", "seeming", "seems", "sees", "several", "shall", "she", "should", "show", "showed", "showing", "shows", "side", "sides", "since", "small", "smaller", "smallest", "so", "some", "somebody", "someone", "something", "somewhere", "state", "states", "still", "still", "such", "sure", "t", "take", "taken", "than", "that", "the", "their", "them", "then", "there", "therefore", "these", "they", "thing", "things", "think", "thinks", "this", "those", "though", "thought", "thoughts", "three", "through", "thus", "to", "today", "together", "too", "took", "toward", "turn", "turned", "turning", "turns", "two", "u", "under", "until", "up", "upon", "us", "use", "used", "uses", "v", "very", "w", "want", "wanted", "wanting", "wants", "was", "way", "ways", "we", "well", "wells", "went", "were", "what", "when", "where", "whether", "which", "while", "who", "whole", "whose", "why", "will", "with", "within", "without", "work", "worked", "working", "works", "would", "x", "y", "year", "years", "yet", "you", "young", "younger", "youngest", "your", "yours", "z", "und", "u.", "", '/', '++', '+', '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', '*', '>', '<', 'etc', "fehler", 'strong', 'direct', 'incl', 'ç¨', '¢', 'ä', 'äú', ',Ä†', ',â†', ',àö', '¬', '¬±']

Table A1: Descriptive statistics (dichotomous variables).

Variable	*Coding*	*N*	*%*
Male	male	3267	75.9
	female	1025	24.1
	total	4301	100
Green founder	founded green company	1965	45.7
	founded non-green company	2336	54.3
	total	4301	100
Metropolis	founded in small city	2373	55.2
	founded in large city	1928	44.8
	total	4301	100
Location change	founded in same location	2689	62.5
	changed location	1612	37.5
	total	4301	100
Changed to small	no change to small city	3551	82.6
	changed to found in small city	750	17.4
	total	4301	100
Changed to large	no change to large city	3439	80.0
	changed to found in large city	862	20.0
	total	4301	100
Changed country	founded in same country	3743	87.0
	changed to found in another country	558	13.0
	total	4301	100
Country	Germany	1645	38.2
	United Kingdom	868	20.2
	France	606	14.1
	Spain	256	6.0
	Scandinavia	208	4.8
	BeNeLux	205	4.8
	Switzerland	151	3.5
	other European countries	362	8.4
	total	4301	100
Industry	government and education	40	.9
	financial services	762	17.7
	manufacturing	717	16.7
	consulting	1177	27.4
	media and telecommunications	281	6.5
	pharma and life science	92	2.1
	research	236	5.5
	information technology	389	9.0
	clothing and retail	206	4.8
	tourism	134	3.1
	others	267	6.2
	total	4301	100

Note: BeNeLux includes the countries: Belgium, Netherlands, and Luxembourg. Scandinavia includes the countries: Denmark, Norway, Finland, and Sweden. United Kingdom includes the countries: England and Ireland. Other European countries include: Austria, Bulgaria, Czech Republic, Greece, Italy, Poland, Portugal, and Romania.

Table A2: Descriptive statistics (continuous variables).

Variable	*Coding*	*N*	*Min*	*Max*	*M*	*SD*	*p50*
Age	measured in years	4301	18	92	44.88	10.05	45
Education	ranges from 1=vocational collage to 4=PhD	4301	1	4	2.32	0.95	3
Competition	number of start-ups in the same region	4301	0	678	162.85	225.26	19
Universities	number of universities in the same region	4301	0	25	14.54	7.90	2
Funding	investment into start-ups in a given region in the same region	4301	3.25	65.49	50.12	13.62	48
Distance	between previous and founding location	4301	0	18488	773.56	2269.22	32

Table A3: Pearson correlation between variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
CSO	1												
External hire	.332***	1											
Firm attachment	–.126***	–.066***	1										
Change rate	–.207***	–.048***	–.029**	1									
Tenure (in role)	–.177***	–.063***	.289***	.159***	1								
Age at becoming CxO	–.072***	–.043***	–.258***	.096***	–.355***	1							
Leadership	–.093***	-.026	–.149***	.059***	–.136***	.375***	1						
Open for new positions	.009	.008	–.064***	.003	–.078***	.021	.098***	1					
Firm size	-.022	-.017	.015	-.001	–.087***	.129***	.437***	.024	1				
Gender	.030**	-.014	–.176***	.010	–.059***	.112***	.100***	.004	.074***	1			
Age	–.087***	–.032**	–.222***	.086***	–.210***	.782***	.489***	-.001	.186***	.137***	1		
Education	.057***	.016	–.149***	-.005	-.026	.055***	-.011	–.033*	–.043***	.077***	.043***	1	
Languages	.018	.015	–.285***	.115***	-.021	.073***	.013	–.086***	–.027**	.093***	.082***	.120***	1

Note: Significance noted as: p-value $< .10 =$ *, p-value $< .05 =$ ***, p-value $< .01 =$ ****.

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