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The Impact of Corporate Support Programs on Environmental and Social Innovation: Empirical Insights from the Food and Beverage Industry

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The Impact of Corporate Support Programs on Environmental and Social Innovation: Empirical Insights from the Food and Beverage Industry

Abstract

Purpose- We analyze the influence of corporate support programs on managers' environmental and social innovation behaviors. To offer a more comprehensive understanding of these relationships, we also account for the moderating role of technological reflectiveness and business moral values.

Design/methodology/approach- We adopt a scenario-based experimental study to test the impact of corporate support programs on environmental and social innovation behaviors. After running a pre-test to verify the effectiveness of alternative scenarios through 100 respondents with managerial experience residing in the UK and EU countries, we collected data from a sample of 220 senior managers of firms from the Australian food and beverage industry for the main study. We used one-way ANOVA with Dunnett's test to investigate direct relationships and the PROCESS Model to test the moderating role of technological reflectiveness and business moral values.

Findings- Our findings reveal time provision, budget provision, and advice provision as salient forms of corporate support programs that positively impact managers' environmental and social innovation behaviors. We find that technological reflectiveness positively moderates the link between time provision and managers' social innovation behavior and negatively moderates the link between advice provision and managers' social innovation behavior. Furthermore, we find that business moral values positively moderate the relationships between time and budget provisions and managers' environmental innovation behavior and between budget and advice provisions and managers' social innovation behavior.

Originality/value- We contribute to innovation and operations management research by adopting a behavioral operations management perspective and empirically analyzing the influences of managers' technological reflectiveness and business moral values on the relationship between organizational corporate support programs and managers' environmental and social innovation behavior in the context of the food and beverage industry.

Keywords

Business Moral Values; Corporate Support Programs; Environmental and Social Innovation; Food and Beverage Industry; Technological Reflectiveness

Paper type

Research Paper

1. Introduction

Businesses are increasingly implementing corporate support programs—systematic organizational sustenance and resource provision for specific work behaviors—for their managers to meet economic objectives through innovation (Engelen *et al.*, 2018). Recent innovation literature acknowledges the vital role of corporate support programs in incentivizing and promoting managers' innovation behavior (Bäckström & Bengtsson, 2019; Engelen *et al.*, 2018). Meanwhile, it is an established fact that today's business environments are inundated with a wide range of environmental and social challenges (Andrade-Valbuena & Torres, 2018; Schweitzer *et al.*, 2015). Hence, some recent studies have highlighted that managers' innovations can provide a key lever in addressing these emergent challenges beyond achieving economic objectives (Martí, 2018). As such, while corporate support programs have thus far been analyzed in relation to economic innovation (Engelen *et al.*, 2018), there is an untapped potential to investigate their role in environmental and social innovation.

Past operations management (OM) studies have recognized the importance of innovation within firms but have mainly focused on aspects and drivers of innovation at the organizational level while providing fewer insights into the drivers of innovation at the manager level (Cai & Lee, 2018; Dai *et al.*, 2015). Specifically, extant literature provides few insights into the behavioral aspects of innovation and offers limited knowledge of the factors that drive managers to engage in innovation (Kunz & Linder, 2013). As Massu *et al.* (2018, p. 329) recognize, “scholars and practitioners are calling for the identification of the underlying factors of managerial innovation and investigating its processes...very little research concentrated on managers' willingness to step aside from their current practices with the intent to innovate”. As such, a lack of such studies within the OM literature reveals a notable gap.

Moreover, while corporate support programs are found to be positively associated with managers' innovative behavior (Engelen *et al.*, 2018), it is unknown whether this linkage can be maintained when organizations' managers seek to develop environmental and social

innovation (ESI). Likewise, while corporate support programs can be a major extrinsic driver of managers' innovative behavior, little is known about how such programs interact with managers' intrinsic characteristics in daily operations, such as technological reflectiveness—the propensity to ponder the societal impact of innovations—(Schweitzer *et al.*, 2015) and business moral values-personal moral values of individuals in relation to their business interactions (Jiang *et al.*, 2011, p. 239). The extant research has yet to account for the boundary conditions of the link between corporate support programs and ESI behaviors that are intrinsic to managers who might be expected to leverage corporate support programs for innovative solutions and the betterment of their environment and society.

It is important to address these research gaps in view of the profound challenges the world faces that entail innovative solutions and transformative approaches (George *et al.*, 2016; Martí, 2018) through a holistic account of intrinsic and extrinsic factors. The environmental and social challenges the world faces, and particularly those that are related to climate, water and land pollution, food security, social inequality, and inclusive development, can be addressed via ESI in daily operations (Dai *et al.*, 2015; Desmarchelier *et al.*, 2020; Horbach, 2008; Kusi-Sarpong *et al.*, 2019). Especially in line with the argument that big changes start with small steps, it is important to understand whether corporate support programs lead to ESI behaviors in the behavioral OM context, and under what conditions such a link is stronger or weaker. This approach also supports the view that OM, where strategy meets daily operations through people (Fahimnia *et al.*, 2019) and abstract ideas/strategies come to fruition, is a harbinger of environmental and social sustainability (Abdul-Rashid *et al.*, 2017; Bendoly *et al.*, 2021).

Against this backdrop, our paper aims to delve into the influence of corporate support programs on managers' innovation behavior and the moderating role of technological reflectiveness and business moral values in the linkages between corporate support programs and ESI behaviors. Driven by this core objective, we pose the following important yet

unanswered research questions: 1) *How does the provision of a) time, b) budget, and c) advice through corporate support programs influence managers' ESI behavior?* 2) *Does managers' technological reflectiveness moderate the impact of a) time, b) budget, and c) advice provision on their ESI behavior?* 3) *Do managers' business moral values moderate the impact of a) time, b) budget, and c) advice provision on their ESI behavior?*

To address these research questions, we conducted a scenario-based experimental study drawing on a sample of 242 senior managers of firms in the Australian Food and Beverage Industry (AFBI). The food and beverage industry (FBI) is one of the few industries globally that has a profound role in the daily lives of all humans (Ali & Gölgeci, 2020). Given its large logistics footprint worldwide, this industry can play a key role in food security and safety (Lawrence, 2017) and environmental sustainability (e.g., Zhao *et al.*, 2020). The significance of the FBI has been further re-established by recent developments, where it has emerged as a key strategic industry in ensuring a sustained supply of food amid rising uncertainties (e.g., Lawrence, 2017). The organizations in the AFBI have recently experienced a plethora of challenges accompanied by structural, technological, and operational alterations in business operations (Ali & Gölgeci, 2020).

However, despite its relevance and challenges ingrained in the FBI, the industry has not received as much attention as it deserves, especially regarding the role of innovation in tackling environmental and social challenges. Our paper focuses on this pertinent industry in view of its importance and the environmental and social challenges it faces and brings in the key intrinsic factors of business moral values (Jiang *et al.*, 2011) and technological reflectiveness (Grint & Woolgar, 2013; Schweitzer & Van den Hende, 2017).

We seek to make several contributions. We make a chief contribution to the literature examining drivers of managerial innovation and, more specifically, the scarce behavioral OM literature on this topic, by revealing factors that lead managers to innovate in the pursuit of addressing environmental and social challenges. In addition, we aim to contribute to the

interface of innovation and OM literature streams. Specifically, our manuscript is one of the first studies to theorize and hypothesize relationships between corporate support programs and ESI behaviors, especially in the FBI. Furthermore, a key contribution of our paper comes from being one of the first to hypothesize and empirically analyze the influences of technological reflectiveness and business moral values on the relationship between corporate support programs and managers' ESI behavior.

2. Theoretical background and hypotheses

2.1. A brief overview of drivers of managerial innovation behavior

Behavioral OM has been a relatively strong research domain within the field of OM, with a growing acknowledgment that almost every context in OM contains people with emotions, values, dissonances, and preferences rather than hyper-rational actors with mechanistic actions (Fahimnia *et al.*, 2019). Behavioral OM literature reveals few insights into the factors that lead managers to engage in innovation, such as worker expertise and psychological safety (Lee *et al.*, 2011), cost uncertainty and the contract frame (Wuttke *et al.*, 2018), and tolerance for failure and monetary incentive schemes (Hutchison-Krupat & Chao, 2014) (see Table I for further details). However, these insights from OM research remain insufficient, and management literature offers somewhat stronger guidance on the specific drivers of managerial innovation behavior that the current study focuses on.

The impetus for managers to innovate can come from various sources. Various situations can prompt managers to develop new solutions or discourage them from doing so (Birkinshaw *et al.*, 2008; Hutchison-Krupat & Chao, 2014). To illustrate, Birkinshaw *et al.* (2008) suggested that managers tend to innovate when confronted with organizational changes, while they are less likely to innovate when they lack knowledge, time, energy, or cooperation from other firm employees (Anderson *et al.*, 2014).

Ettlie and O'Keefe (1982) emphasized the importance of investigating individuals' innovative behaviors within different organizational contexts. They found that individuals who

are queried regarding their intent to innovate in a general way are more likely to elicit a positive response because they perceive that being nominated as an innovative manager is socially desirable within organizations. Kunz and Linder (2015) focused on individual-specific attributes that lead managers to innovate and found that need for achievement influences managers' intentions to innovate, while the need for power does not. Moreover, managers' attitude toward new practices influences these relationships (Kunz & Linder, 2015).

Individual behavior within firms has traditionally been explained using the expectancy theory (Vroom, 1964). According to this theory, individual behavior and motivation within organizations are shaped by the individual's expectation that one's behavior will trigger a specific outcome and that the outcome is of interest to the individual (Grant & Ahsford, 2008). A different stream of research has relied on the theory of planned behavior to determine the factors that lead individuals to engage in certain behaviors (Fishbein & Ajzen, 2011). According to the tenets of this theory, attitude toward the behavior and perceived behavioral control influence the propensity to engage in the behavior. Consistent with this framework, Massu *et al.* (2018) found that attitudes toward innovative behaviors and perceived behavioral control influence managers' intention to adopt innovative behaviors.

In sum, past studies have focused on different factors external to the manager (e.g., organizational culture and power relations, firm size and market scope, the firm's economic and competitive situation, the centralization of decision authority) and internal to the manager (e.g., problem-solving style, attitudes, personality factors, and cognitive styles) as drivers of managerial innovation (Kunz & Linder, 2015). A noteworthy limitation of these streams of research is that these studies shed little light on the type of innovative behavior triggered by these various drivers. For example, Engelen *et al.* (2018) proposed that corporate support programs positively impact managers' innovative behavior but do not specify what types of innovative behavior can be supported. We seek to fine-tune this conversation and shed further light on the complexity of these relationships by examining the impact of various types of

corporate support programs (i.e., time provision, budget provision, and advice provision) on different types of innovative behavior (i.e., ESI behaviors).

2.2. Behavioral perspective of environmental and social innovation in operations management

The environmental and social challenges the world is increasingly facing represent a wide range of pressing, complex, and daunting problems that require both a systematic approach and operational conscientiousness (George *et al.*, 2016). Food security, climate change, and increased exposure to natural disasters are at the forefront of many environmental and social challenges (Lawrence, 2017). Hence, the FBI is one of the industries most vulnerable to such challenges (Ali & Gölgeci, 2020). Environmental and social challenges are therefore of prime relevance to the FBI. Despite the critical relevance of the FBI in this context, little is still known about how firms operating in the FBI tackle environmental and social challenges. We therefore focus on the FBI as a centrally relevant yet underexplored research domain *vis-à-vis* environmental and social challenges that could be addressed via ESI.

Defined as any product, process, or organizational “innovation that is able to reduce environmental impact and resource use” (Borghesi *et al.*, 2015, p. 669) and as “a novel solution to a social problem that is more effective, efficient, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals” (Phills *et al.*, 2008, p. 39) respectively, environmental innovation and social innovation are at the forefront of addressing environmental and social challenges. Accordingly, managers’ ESI behaviors can be important pillars of tackling environmental and social challenges.

Innovative managers engage in tasks that go beyond routine procedures and require significant persistence and creativity (e.g., Bäckström & Bengtsson, 2019). In the complex and convoluted circumstances surrounding ESI, it is therefore critical to understand what drives managers to engage in such innovative behaviors to determine the potential of management practices like support programs to increase such behavior (Engelen *et al.*, 2018). This aspect becomes more important as recent research in the OM field has also highlighted the importance

of behavioral aspects in strengthening the understanding of issues viewed through a narrow mechanistic lens (e.g., Fahimnia *et al.*, 2019).

Several OM studies have sought to uncover the various drivers of ESI. Theyel (2000) found that practices such as certification of suppliers, total quality management, research and development, and the involvement of employees could help improve environmental innovation. Geffen and Rothenberg (2000) found that partnerships with suppliers, in conjunction with appropriate incentive systems, helped spur environmental innovation. Likewise, firms face pressure from their competitors' success in ESI, which further prompts them to engage in various integration activities (e.g., internal, customer, and supplier) that positively influence ESI (Dai *et al.*, 2015).

Table I presents our study within the context of relevant research on ESI in addition to innovation in behavioral OM. As Table I demonstrates, interest in research around environmental and social issues in the OM domain is growing. For example, the research, has found that environmental innovation is driven by green business operations (Dai *et al.*, 2015), technological capabilities and competitive pressure (Cai & Li, 2018), interorganizational fit (Shou *et al.*, 2018), while social innovation is enabled by interorganizational collaboration (Kalkanci *et al.*, 2019) and co-creation (De Silva *et al.*, 2020). We seek to complement this stream of OM research by investigating both organizational (corporate support programs) and individual (technological reflectiveness and business moral values) drivers of ESI.

-----**Insert Table I**-----

Environmental and social challenges are heterogeneous, fragmented, and complex problems that require innovative behaviors rather than mechanistic, linear, and monolithic solutions (Martí, 2018). As managers are well-versed with ground-level issues and more capable of developing innovative solutions to challenging problems, firms are compelled to utilize the innovative behavior of their managers as a significant potential for innovation in their workforces (Engelen *et al.*, 2018). The managerial drivers for conducting specific business

practices, including ESI, can be examined through two major categories of drivers. These categories are intrinsic drivers—managerial behavior driven by internal values, expectations, and rewards—and extrinsic drivers—managerial behavior driven by external demands, support, and rewards (Amabile, 1993; Kuvaas *et al.*, 2017).

The extant research has extensively examined intrinsic and extrinsic drivers separately. That said, a growing number of studies have examined the interplay between the two (e.g., Kuvaas *et al.*, 2017). Some studies revealed that when intrinsic motivation was high, the role of extrinsic motivation diminished (Kuvaas *et al.*, 2017). Other studies have argued that “certain types of extrinsic motivation can combine synergistically with intrinsic motivation, particularly when initial levels of intrinsic motivation are high” (Amabile, 1993, p. 185). Concerning ESI, the extant research indicates that the combination of and synergy between two drivers results in greater ESI behavior, while an asymmetric emphasis on one driver may overshadow the role of the other driver (Li *et al.*, 2020). Thus, the joint leverage of both organizational (extrinsic) and intrinsic drivers of managers’ innovation behavior is vital to effectively address environmental and social challenges. Such joint leverage of intrinsic and extrinsic drivers of ESI can lead to synergies in tackling environmental and social challenges. We therefore examine the role of both corporate support programs as an extrinsic driver of managers’ ESI behavior and technological reflectiveness and business moral values as intrinsic boundary conditions.

2.3. *Corporate support programs*

The concept of corporate support programs as a pivotal extrinsic driver for managers is rooted in the research on organizational support (Eisenberger *et al.*, 1986; Rhoades & Eisenberger, 2002). Defined as the degree of systematic organizational encouragement and resource availability regarding managers’ specific work-related behaviors (Eisenberger *et al.*, 1986), corporate support programs can be an essential extrinsic driver of managers’ ESI behavior. In fact, corporate support is considered the foundation upon which managers thrive and are

empowered to pursue organizational and individual goals (Rhoades & Eisenberger, 2002; Van Yperen & Hagedoorn, 2003). In this study, we adopt a behavioral perspective on ESI, because it manifests an enduring concern with the allocation of time, budgets, and other resources. When examining corporate support programs, we concentrate on organizational incentives of time, budget, and advice provision toward managers' innovation initiatives.

In the context of managers' innovation behavior, support programs offer material and immaterial resources for enabling and encouraging managers' innovative initiatives. The extant literature has therefore stressed the importance of support programs to support innovative behaviors (Bäckström & Bengtsson, 2019; Engelen *et al.*, 2018), an approach to which our paper is drawn. It has already been stressed that it is important to consider ESI (e.g., Hall *et al.*, 2012; Von Schomberg & Hankins, 2019). We therefore argue for the analysis of ESI behaviors of the managers in relation to corporate support programs. Our argument has some roots in recent OM research that has highlighted the importance of these support programs, especially in the transition to sustainable supply chains and associated innovations (e.g., Kusi-Sarpong *et al.*, 2019).

Drawing on Birdi *et al.* (2016) and Engelen *et al.* (2018), we argue that corporate support programs can be an important lever for managers' ESI behavior. Corporate support programs can be categorized by providing time, budget, or advice (Birdi *et al.*, 2016). Time provision allows managers to autonomously dedicate a specific part of their usual worktime to innovative projects. Budget provision comprises access to dedicated funding for financing or obtaining a workforce to pursue innovation endeavors (Engelen *et al.*, 2018). Advice provision entails supervisors or other relevant managers offering expertise and guidance to support managers' innovative endeavors (Van Yperen & Hagedoorn, 2003). The essence of such support programs is that they are provided by design either universally or based on red-tape-free and easily available approval processes.

2.4. Technological reflectiveness and business moral values

Although the extrinsic drivers of ESI behaviors can be critical, solely exploring the role of extrinsic drivers in managers' ESI behaviors may not lead to a fuller picture of how firms tackle environmental and social problems. Accordingly, we examine the role of technological reflectiveness and business moral values in the relationship between corporate support programs and managers' ESI behavior.

Technological reflectiveness represents managers' tendency to analyze the past influences of technological products on society and plan technological solutions' potential effects on society (Schweitzer *et al.*, 2015; Schweitzer & Van den Hende, 2017). "Technological reflectiveness is related to a cognitive, inquisitive and introspective effort using experiences and reflections for an understanding, judgment, and evaluation of the impact of a novel artifact or a new technological release" (Andrade-Valbuena & Torres, 2018, p. 85). The stress on the influences of technological solutions on society is strongly linked to the importance of this characteristic of managers in the context of addressing environmental and social challenges (e.g., Grint & Woolgar, 2013). Technologically reflective individuals have a natural inclination to analyze both technical and social systems, as well as their interactions (Andrade-Valbuena & Torres, 2018). Their reflections on the linkage between technology and society strengthen their understanding of the potential societal impact of a specific technology or technological product (e.g., Schweitzer *et al.*, 2015). Such managers can further see the interlinkages and potential of certain technologies that others, who only focus on their daily routines or a domain (field) specific knowledge, may miss. Some previous studies focusing specifically on social innovation have highlighted the importance of such individuals in this context, as they can better link the largest societal issues with technology rather than merely focusing on the operation aspects (e.g., van Wijk *et al.*, 2019). Such managers can therefore be instrumental players for concept generation and refinement in ESIs. They are also good at self-learning from previous experiences, which is an important characteristic in the context of social (Desmarchelier *et al.*, 2020) and environmental (De Marchi, 2012; Horbach, 2008) innovations.

Personal moral values are predicated on the criteria by which individuals judge whether a behavior is morally right or wrong when interacting with other people (Jiang *et al.*, 2011). These criteria are grounded in four fundamental principles of (a) personal integrity and truthful communication; (b) upholding one's own rights and not meddling with others' rights; (c) respecting life and acting responsibly; and (d) abiding by rules and principles of justice (Scott, 2000). The concept of business moral values builds on the insights provided by research on personal values (Schwartz, 2005; Scott, 2000) and is defined as "the personal moral values held by individuals who are engaged in business interactions" (Jiang *et al.*, 2011, p. 239). Accordingly, trustworthiness, respect, responsibility, fairness, caring, and citizenship are important aspects of business moral values (Schwartz, 2005). On the other hand, unethical behaviors in the business context that may compromise personal and organizational integrity include stealing trade secrets, using worktime for personal matters, taking undue credit for other colleagues' work, absenteeism and procrastination, fabricating and altering reports, and bribery with important implications for the managers and the firm (McDonald & Zepp, 1988). Consequently, given their relevance to individual and organizational effectiveness (Jiang *et al.*, 2011), business moral values could be an important boundary condition, influencing how organizational drivers translate into managers' ESI behaviors.

2.5. Hypotheses

2.5.1. Direct relationships. The positive link between corporate support programs and innovative behaviors has previously been examined. In their study, Engelen *et al.* (2018) find that there is a positive relationship between corporate support programs and managers' innovative behavior. This study explores whether the overall relationship between extrinsic corporate support programs and innovative behaviors holds up regarding ESI behaviors, and how intrinsic drivers moderate such linkages to tackle environmental and social problems.

Environmental and social challenges may compel managers to act and provoke them to develop innovations that address such problems. However, with their pressing daily work

routines and tasks, managers often need external support if they are to devote sufficient time and effort to developing innovative solutions to the problems they and their community face (Eisenberger *et al.*, 1986; Rhoades & Eisenberger, 2002). As manifested in terms of time provision, budget provision, and advice provision, support programs can be an instrumental means of communicating the value of such innovations across the firm and facilitating managers to engage in innovative endeavors toward environmental and social challenges (Engelen *et al.*, 2018). Such programs may also allow managers to think independently about and pursue innovative endeavors and establish environmental and social collaboration within the work environment. Likewise, corporate support mechanisms like time provision, budget provision, and advice provision can empower managers, enhance their confidence in the value and relevance of their environmental and social pursuits, and enable them to deal better with the complexities and uncertainties of their innovative behaviors.

On the other hand, it is possible that corporate support programs may be constrained or do not work as intended if they do not match managers' values and priorities (Engelen *et al.*, 2018). At times, they might also be too costly to run, and their costs may outweigh their potential benefits for managers. Some support programs come with caveats (e.g., Oliffe *et al.*, 2020) such as being vulnerable to misuse, ineffectiveness, scaling limitations, and the possibility of backfiring. Some firms may be unable to craft effective support programs for their managers. Even if they do, these programs may not work as intended because of operational constraints, the lack of top management commitment (Bendoly *et al.*, 2021), and other possible factors outside firms' control. As such, corporate support programs are not failproof packages that will universally solve environmental and social problems, but their value may be contingent on numerous factors that may either foster or derail these programs.

That said, it has already been argued earlier that support programs are an important factor in the transition to sustainable supply chains and associated innovations (Kusi-Sarpong *et al.*, 2019), especially in the context of firms operating in the FBI that face severe and

occasionally overwhelming environmental challenges (Ali & Gölgeci, 2020; Zhao *et al.*, 2020), linked with the important social challenge of hunger/food supply (e.g., Bilali, 2019); corporate support programs can be the lifeblood of managers' ESI behaviors. We therefore propose:

H1: *The provision of a) time, b) budget, and c) advice through corporate support programs will have a positive impact on managers' environmental innovation behavior.*

H2: *The provision of a) time, b) budget, and c) advice through corporate support programs will have a positive impact on managers' social innovation behavior.*

2.5.2. Moderating role of technological reflectiveness and business moral values. As stated above, while support programs can provide conducive ground for ESI behaviors to flourish, the strength of this relationship is likely to be influenced by intrinsic factors (Amabile, 1993; Kuvaas *et al.*, 2017; Li *et al.*, 2020). It is possible that the inherent values of technological reflectiveness and business moral values positively moderate and complement the role of corporate support programs in managers' ESI behaviors.

The essence of technological reflectiveness is a holistic and in-depth reflection on both the positive and negative aspects of technological innovations and their implications for society and the natural environment (Schweitzer *et al.*, 2015). Technological reflectiveness encompasses the perception of a new framework when rethinking the situation for society, extrapolating personal experiences and diligently evaluating the pertinence and utility of the adoption of technological innovations by the members of that society (Andrade-Valbuena & Torres, 2018). Technologically reflective managers are thus often more grounded and stronger in acting on ESI possibilities when provided with the necessary opportunities through corporate support programs. Managers with high technological reflectiveness may depend less on the extrinsic stimuli of support programs (cf. Kuvaas *et al.*, 2017). Nonetheless, it is probably more likely that technological reflectiveness act as a catalyst for the role of support programs in managers' ESI behaviors. As technological reflectiveness embodies an individual's motivation for reasoning about technology–society associations (Schweitzer *et al.*, 2015), technologically

reflective managers may be better positioned to utilize various opportunities such as time provision, budget provision, and advice provision. It is possible that technologically reflective managers may not necessarily need corporate support programs to take environmental and social sustainability initiatives. However, they may have a greater tendency to make use of such support programs to realize their ideas for environmental and social sustainability more effectively.

Our theoretical arguments are grounded in the technology diffusion theory (Eaton & Kortum, 1999). This theory seeks to explain why, how, and at what rate new ideas and technology spread. According to the tenets of this theory, an individual's awareness of the need to innovate influences the decision to engage in innovation (Ghezzi *et al.*, 2013). Managers characterized by a high level of technological reflectiveness are more in tune with the latest technological developments (Andrade-Valbuena & Torres, 2018) and are thus more aware of the need to innovate to remain competitive. Hence, we posit:

H3: *Managers' technological reflectiveness positively moderates the impact of a) time provision, b) budget provision, and c) advice provision on their environmental innovation behavior.*

H4: *Managers' technological reflectiveness positively moderates the impact of a) time provision, b) budget provision, and c) advice provision on their social innovation behavior.*

Business moral values constitute the bedrock on which responsible and sustainable business practices are built and applied (Schwartz, 2005). They represent fundamental intrinsic drivers for acting responsibly and pursuing goals that matter to the environment and society. Managers with high moral values are more prone to expose illegal behaviors in the firm, avoid giving gifts or benefits for favorable treatment in interorganizational relationships, eschew gossiping and being absentminded during working hours, do their best to accomplish their work, devote their worktime fully to their work, and abstain from cheaper components that may harm the environment and society (Farh & Cheng, 2000; Jiang *et al.*, 2011). Accordingly, business

moral values can be an instrumental catalyst to realizing the full potential of corporate support programs when pursuing ESI.

Managers who have greater business moral values than their colleagues are more likely to be willing to use and leverage support programs to their fullest extent to tackle the challenges they and their community face. For example, moral values that underlie abstinence from low-quality and environmentally hazardous ingredients in the FBI can prompt managers to find more effective ways to leverage the support programs that are at their disposal for ESI. Likewise, as managers with higher moral values are more likely to utilize their worktime more effectively (Farh & Cheng, 2000), they can better leverage time provision than their colleagues with lower moral values. Furthermore, high moral values indicate greater integrity and respect for colleagues and supervisors (Scott, 2000), enabling greater access to and better absorption of advice provision for ESI.

Our arguments are consistent with moral identity theory (Hardy, 2017). Individuals with higher morals will find that their beliefs are aligned with corporate support programs intended to induce positive changes and will be more likely to support ESI-related initiatives “because doing otherwise would create an unpleasant situation of cognitive dissonance (Pletti *et al.*, 2019, pp. 435–436). However, managers with higher moral values may not be keen on leveraging support programs for ESI if these programs are not consistent with the overall organizational strategy/policy. In such cases, managers may perceive support programs as hypocritical or futile, because they do not serve the overarching organizational identity and mission, leading to cognitive dissonance and conflicts with their own moral values. That said, on balance, we expect that:

H5: *Managers’ business moral values positively moderate the impact of a) time provision, b) budget provision, and c) advice provision on their environmental innovation behavior.*

H6: *Managers’ business moral values positively moderate the impact of a) time provision, b) budget provision, and c) advice provision on their social innovation behavior.*

Our conceptual framework is depicted in Figure 1.

-----Insert Figure 1-----

3. Methodology

3.1. Pre-test study

As we adapted scenario-based experimental study to test the impact of corporate support programs on ESI, we recruited 100 respondents—who resided in the UK and the EU countries, were at least college graduates, and worked in managerial positions—from Prolific in exchange for monetary compensation (£0.87 for each participant for about 6 minutes of their time) to conduct a pre-test to ensure the effectiveness of our scenarios (manipulations). We adapted our four different corporate support programs scenarios (no support, time provision, budget provision, and advice provision scenarios) from Engelen *et al.* (2018). In the pre-test, we tested whether each manipulation/scenario worked as intended. We asked respondents to read the scenarios carefully and imagine themselves in the manager's role in the scenario. Previous studies have successfully implemented this approach for pre-testing (e.g., Aloysius *et al.*, 2016; Bozkurt & Gligor, 2021). We eliminated one piece of missing data from the dataset; we ended up with 99 (54 Males, 44 Females, 1 prefer not to say, $Age_{mean}=30.66$) usable responses.

In this pre-test, each participant was randomly assigned to one of the four conditions. We asked a manipulation check question to check whether the manipulations worked as intended. For example, we asked the participants, “Which of the following best describe the scenario you have just read above?” The Chi-Square tests results revealed that 96% of respondents in the no support condition, 88% of respondents in the time provision condition, 92% of respondents in the budget condition, and 91.7% of respondents in the advice condition accurately described the scenario they read, which results in successful manipulation test ($\chi^2=238, 896, p<0.001$)¹.

¹ In this study, the significance level is set at 0.10. Also, we used a one-tail test for all our directional hypotheses.

In this pre-test, we also included two items designed to evaluate the extent to which the scenarios were believable and realistic. These two items were evaluated using a seven-point bipolar scale (1=extremely unbelievable/unrealistic, 7=extremely believable/realistic). We adapted this scale from Bozkurt and Gligor (2021). The participants found all scenarios realistic and believable, as the means for the no support, time provision, budget provision, and advice provision conditions were 4.76, 5.02, 5.00, and 4.98 respectively. The results provided additional evidence that the manipulations were realistic and believable.

3.2. *Main study*

This study examined the impact of four different forms of corporate support programs (no support, time provision, budget provision, and advice provision) on managers' ESI behaviors. This study also explored whether technological reflectiveness and business moral values moderated the impact of corporate support programs on managers' ESI behaviors. An experimental scenario-based survey was implemented to capture respondents' views on four different types of corporate support. The key advantage of an experimental design is the robust causal inferences provided by controlled manipulation of treatment variables and randomization (Aguinis & Bradley, 2014; Salonen *et al.*, 2021). Experimental design has high explanatory power and enables direct causal conclusions to be drawn by relying on interventions. It also helps generate better causal explanations (Salonen *et al.*, 2021). We therefore chose a scenario-based experimental research design, because it enabled us to explore relationships that could be intuitive but difficult to isolate in contextually rich field studies. It also enabled us to better capture managers' reactions to support programs in relation to ESI (cf. Aloysius *et al.*, 2016).

As mentioned earlier, the data were collected from senior managers from the AFBI, which is Australia's largest manufacturing sector, significantly contributing to the national economy and employment. The firms in the industry have globalized business operations with export of foods and beverages to more than 40 countries at a value of about \$49 billion annually

(Australian Food & Grocery Council, 2019). Australia produces far more food than consumed domestically; it exports around 65% of total food products (Bellotti, 2018). This makes Australia among the major suppliers of food and beverages worldwide. Australia's FBI has an excellent international reputation for supplying premium quality and clean food – clean and green food production.

The AFBI has been experiencing a series of pervasive and persistent challenges, *inter alia*, climate change, droughts, bushfires, and floods. For example, research shows that constantly changing climate conditions mean the number of hot days per annum has increased sharply over the past decade (Ali & Gölgeci, 2020). This has led to bushfires (e.g., the massive bushfires of late 2020) and droughts and floods, severely eroding the business operations and environment (Ali & Gölgeci, 2020). The existing challenges have been further compounded by the recent Covid-19 crises, such as border closures, mobility restrictions, and food supply shortages. Such challenges could seriously disrupt the operations of the AFBI and thereby exacerbate the global food supply shortage, hunger, unemployment, and malnutrition. The organizations in the AFBI have thus constantly been undergoing various structural, technological, and operational transformations of business operations, maintaining the continuity of business operations amid multiple challenges. We therefore find the AFBI to be an interesting and relevant context to answer this study's key research questions.

Furthermore, while the Covid-19 pandemic already disrupted the global food markets, the Russia-Ukraine war has disrupted food supply chains and increased the risk of food insecurity worldwide. To illustrate, the recent war has already slashed the export of wheat and other food commodities (e.g., corn, sunflower), increasing the risk of food insecurity in almost 50 import-reliant countries (NIESR, 2022). Such recent developments underscore the criticality of the FBI and unprecedented challenges organizations currently face in the FBI, further stressing the relevance of the research context.

Following the pilot study, 978 questionnaires were distributed among the firms' senior managers in the AFBI using Qualtrics software. The respondents' contact details were purchased through a registered/authentic broker in Australia. The data collection was launched on February 23, 2021, and closed on March 25, 2021. Participants were assured their responses were anonymous, and that there were no right and wrong answers, which helped mitigate social desirability bias. After four email reminders and several follow-up telephone calls, we received 210 usable online responses. To further increase the response rate, 35 questionnaires were physically distributed. In doing so, a researcher of this study dropped in questionnaires (along with a brief letter of request and a business card addressed to respective managers) on the front desks of the target firms. On confirmation of completion from the front desk, the questionnaires were collected. Thirty-two completed questionnaires out of 35 were received. We therefore ended up with 242 responses.

We used a four factorial design (corporate support programs: no support/time provision/budget provision/advice provision). As indicated above, we adapted the scenarios from the previous study and pre-tested them. Having read introductory scenarios in the survey, each participant was randomly assigned to one of the four conditions. Participants were told that their supervisor did not actively support their innovative initiatives in the no support condition. In the time provision condition, participants were told that their supervisor informed them that they could spend 30% of their time on their innovative projects. In the budget provision condition, they were informed by their supervisor that they could apply for and obtain a specific budget for their innovative projects. In the advice provision condition, they were told that their supervisor supported them with advice within the firm when they had an innovative idea (see Table II for full manipulations).

-----**Insert Table II**-----

As we did in the pre-test, we asked some manipulation check questions to check whether participants paid attention to the manipulations. A total of 22 respondents failed to describe

their scenarios accurately. To increase the quality of the data, we eliminated such responses from the dataset; we ended up with 220 (178 Males, 25 Females, 17 prefer not to say, $Age_{mean}=45.85$) usable responses. Table III shows the demographic properties in more detail.

-----Insert Table III-----

Finally, as we did in the pre-test, we included believability and reliability items in the primary survey to see whether the participants found the scenarios believable and realistic. The descriptive study results revealed that the participants found all the scenarios realistic and believable, as the means for the no support (N=52), time provision (N=56), budget provision (N=57), and advice provision (N=55) conditions were 5.11, 5.84, 5.97, and 5.56 respectively. The results provided additional evidence that the manipulations were realistic and believable.

3.2.1. Common Method Bias. Because we collected our data from one source, a common method bias may impact the results. We conducted Harman's one-factor test to check whether a common method bias was an issue in our study. We used the SPSS factor analysis routine to identify the first eigenvalue from the data matrix in this test. Common method bias may be problematic if the first eigenvalue (e.g., the first component or factor) accounts for most of the variance. The results showed that the first eigenvalue or factor only accounted for 43.64% of the total variance, which does not account for most of the total variance explained (100%). A common method bias is therefore unlikely to bias the results.

3.2.2. Constructs and measures. All the construct measures were drawn from the related literature. The two distinct constructs on ESI behaviors were measured with seven items for environmental innovation and five items for social innovation respectively, adapted from Engelen *et al.* (2018) and Lai *et al.* (2016). Technological reflectiveness was measured with seven items borrowed from Schweitzer and Van den Hende (2017), while the construct of business moral values was measured with 14 items drawn from Jiang *et al.* (2011). All items were assessed on a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7). All scales displayed high levels of reliability (all Cronbach's alphas ≥ 0.70 , exceeding the

recommendation cutoff point for alpha (Hair *et al.*, 2010; Nunnally & Bernstein, 1994). The items for each scale, along with their reliability, are presented in Table IV.

-----Insert Table IV-----

4. Results

4.1. Hypothesis testing

4.1.1. Main effects. To test whether a firm's corporate support programs positively affected managers' ESI behaviors, we used one-way ANOVA with Dunnett's test. We tested whether firms' various support programs such as time provision, budget provision, and advice provision (relative to no support provision) positively impacted managers' different ESI behaviors. As expected, the results showed that providing managers with time ($timeprovision_m = 6.18$, $noprovision_m = 4.13$, $p < 0.001$), budget, ($budgetprovision_m = 6.15$, $noprovision_m = 4.13$, $p < 0.001$) and advice supports ($adviceprovision_m = 5.24$), $noprovision_m = 4.13$, $p < 0.001$) had a positive impact on the managers' environmental innovation behavior. Similarly, all three types of corporate supports, time ($timeprovision_m = 6.16$, $noprovision_m = 4.13$, $p < 0.001$), budget ($budgetprovision_m = 6.12$, $noprovision_m = 4.13$, $p < 0.001$) and advice provisions, ($adviceprovision_m = 5.18$, $noprovision_m = 4.13$, $p < 0.001$) positively impacted managers' social innovation behaviors. As a result, corporate support programs positively impacted managers' ESI behaviors. H1a, b, c and H2a, b, c are therefore supported.

4.1.2. The moderating role of technological reflectiveness. To test whether managers' levels of technological reflectiveness moderated the impact of corporate support programs on managers' innovation behaviors, we used PROCESS Model 1 (moderation analysis) (Hayes, 2022). Because our independent variable was multicategorical, we used "indicator coding" as the coding system. With indicator coding, PROCESS uses the group with the numerically smallest code in the construct specified as an independent variable (X) as the reference group (Hayes, 2022). We had four conditions in the study, so there were g-1 paths, from independent variables

(corporate support programs) to dependent variables (ESI). We coded the “no provision” condition with 0, which was specified as the reference group. We coded “time provision,” “budget provision,” and “advice provision” with 1, 2, and 3 respectively. We then ran PROCESS Model 1 with 5,000 bootstrap samples and 95% confidence intervals by specifying the independent variable as a multicategorical independent variable and choosing the indicator coding system. PROCESS yielded three indicator codes (X1, X2, and X3), representing the four experimental conditions.

The PROCESS Model 1 results showed that none of the corporate support programs’ impact on managers’ environmental innovation behavior was moderated by technological reflectiveness. More specifically, providing managers with time (relative to no support) does not have a higher or lower impact on managers’ environmental innovation when technological reflectiveness is higher than when it is lower ($b=0.38$, $se=0.28$, $p=0.17$). Furthermore, technological reflectiveness does not moderate the impact of the budget provision on managers’ environmental innovation ($b=0.17$, $se=0.36$, $p=0.64$). The effect of advice provision on managers’ environmental innovation behavior also does not differ in the levels of managers’ technological reflectiveness ($b=-0.37$, $se=0.25$, $p=0.15$). H3a, b, c are therefore not supported.

We also tested whether the impact of all three types of support programs on managers’ social innovation behavior was moderated by technological reflectiveness. The impact of time and advice provision on managers’ social innovation behavior was moderated by technological reflectiveness. More specifically, providing managers with time (relative to no support) led them to display a higher level of social innovation behavior when their technological reflectiveness level was higher than when it was lower ($b=0.47$, $se=0.29$, $p=0.10$). H4a is therefore supported. Time provision’s impact on managers’ social innovation behavior was greater with high technological reflectiveness managers than with low technological reflectiveness. However, the results revealed that the impact of the budget provision on managers’ social innovation behavior was not moderated by technological reflectiveness

($b=0.35$, $se=0.38$, $p=0.35$), lending no support to H4b. Likewise, advice provision's impact on managers' social innovation behavior was lower with high technological reflectiveness than with low technological reflectiveness ($b=-0.48$, $se=0.26$, $p=0.07$), which was significant but ran counter to our expectation, failing to support H4c.

Although our results provided evidence of moderation, the significant interaction terms did not establish that corporate support programs affected managers' social innovation behavior for people with high (rather than low) technological reflectiveness and vice versa (Bozkurt, 2021; Bozkurt & Gligor, 2021; Hayes, 2022). To reveal such insights, we probed the interaction terms using the pick-a-point approach (also called spotlight analysis), which is the most popular approach to probing interaction (Bozkurt & Gligor, 2021; Rogosa, 1980). By following Hayes's (2022) recommendation, we used the 16th and 84th percentiles of the distribution when operationalizing relatively low and relatively high levels of technological reflectiveness. As can be seen in Figure 2, the pick-a-point approach showed that providing time provision (relative to no provision) has a positive impact on managers' social innovation behavior both for managers who have high ($\theta_{x \rightarrow y} | (W=6.52)=2.08$, $p<0.01$) and low ($\theta_{x \rightarrow y} | (W=5.57)=1.63$, $p<0.01$) technological reflectiveness (see Figure 2a). Importantly, the impact of time provision on managers' social innovation behavior is greater for managers with high technological reflectiveness than with low technological reflectiveness ($(b=0.47$, $se=0.29$, $p=0.10$).

-----**Insert Figure 2**-----

The pick-a-point approach further revealed that advice provision had a positive impact on managers' social innovation behavior, both for managers with high ($\theta_{x \rightarrow y} | (W=6.52) = 0.71$, $p=0.01$) and low ($\theta_{x \rightarrow y} | (W=5.57)=1.16$, $p<0.01$) technological reflectiveness (Figure 2b). As can be seen in Figure 2 and suggested by the negative interaction term, providing advice provision (relative to no provision) resulted in a higher level of social innovation behavior with low technological reflectiveness than with high technological reflectiveness.

4.1.3. The moderating role of business moral values. We used PROCESS Model 1 with 5,000 bootstrap samples and 95% confidence intervals by specifying the independent variable as a multicategorical independent variable and choosing the indicator coding system (Hayes, 2022). The results revealed that business moral values positively moderated both time and budget provisions' impact on managers' environmental innovation behavior. More specifically, the effect of the time provision was greater when managers' business moral values were higher ($b=1.17$, $se=0.64$, $p=0.069$). It also revealed budget provision had a greater impact on managers' environmental innovation behavior when managers' business moral values were higher ($b=1.20$, $se=0.67$, $p=0.07$). Contrary to our expectation, however, advice support's impact on managers' environmental innovation behavior was not greater or lower when managers' business moral values were higher ($b=0.96$, $p=0.63$, $p=0.13$). While H5a and H5b are supported, H5c is therefore not supported.

Because of the aforementioned reason, we probed the interaction terms using the pick-a-point approach. As shown in Figure 2, regardless of the levels of managers' business moral values, providing time (relative to no support) led to a higher level of environmental innovation behavior: The impact of time provision on managers' environmental innovation behavior was positive both for managers with high ($\theta_{x \rightarrow y} | (W=6.67)=2.61$ $p<0.01$) and low business moral values ($\theta_{x \rightarrow y} | (W=6)=1.83$ $p<0.01$) (Figure 2c). The positive interaction term suggests that the impact of time provision on managers' environmental innovation behavior was greater when managers' business moral values were higher ($b=1.17$, $p=0.64$, $p=0.07$).

The pick-a-point approach further revealed that the budget provision positively impacted managers' environmental innovation behavior, regardless of managers' business moral values. Specifically, the effect of the budget provision on managers' environmental innovation behavior was positive both for managers who had high ($\theta_{x \rightarrow y} | (W=6.67)=2.60$ $p<0.01$) and low ($\theta_{x \rightarrow y} | (W=6)=1.79$ $p<0.01$) business moral values (Figure 2d). The positive interaction term suggests that the impact of the budget provision on managers' environmental

innovation behavior was greater when managers' business moral values were higher ($b=1.20$, $p=0.67$, $p=0.07$) (see Figure 2d).

We also ran PROCESS Model 1 with 5,000 bootstrap samples and 95% confidence intervals to test whether managers' business moral values moderate corporate supported programs' impact on managers' social innovation behavior (Hayes, 2022). The results showed that while budget and advice provision's impact on managers' social innovation behavior was moderated by business moral values, the effect of time provision on managers' social innovation behavior was not moderated by business moral values. More specifically, the impact of time provision on managers' social innovation behavior did not differ by managers' business moral values levels ($b=0.96$, $se=0.67$, $p=0.15$). However, as expected, budget provision's impact on managers' social innovation behavior was greater when managers' business moral values were higher ($b=1.33$, $se=0.70$, $p=0.06$). In the same vein, the effect of advice provision on managers' social innovation behavior was greater when business moral values were higher ($b=1.12$, $se=0.66$, $p=0.09$). All in all, while H6a is not supported, H6b and H6c are supported.

For the reasons mentioned above, we probed the interaction terms using the same approach. The pick-a-point approach results revealed that the impact of the budget provision on managers' social innovation behavior was positive both for managers who had high ($W=6.67$)= 2.63 $p<0.001$) and low ($W=6$)= 1.74 $p<0.01$) business moral values (Figure 2e). The results further revealed that advice provision had a positive impact on managers' social innovation behavior both for managers who had high ($W=6.67$)= 1.62 $p<0.001$) and ($W=6$)= 0.87 $p<0.001$) low business moral values (Figure 2f). As a result, the results provide further support for H6b and H6c. Table V presents the summary of hypothesis testing.

-----Insert Table V-----

5. Discussion and conclusions

The environmental and social challenges are profoundly pressing ahead in nearly every corner of the world. Specifically, ongoing containment measures from Covid-19 have already driven

up food supply shortages and prices (IFPRI, 2022). Moreover, the poor harvest and reduced food supply are increasingly common sights compounded by the recent Russia and Ukraine conflict that has further escalated the risk of food supply and insecurity (IFPRI, 2022). This could push up already high food price inflation and leave serious repercussions for low-income food-importing countries.

Given these facts, both scholars and practitioners seek innovative and effective solutions to overcome problems with unprecedented levels of complexity and severity. Our position is that effective large-scale solutions to environmental and social challenges can be the aggregation of localized and micro innovations targeting small pieces of such challenges in a specific context. In particular, behavioral OM can be a relevant and practical domain, in which managers' innovative behaviors are realized and translated into operational initiatives to tackle environmental and social challenges. Hence, our study examines the role of corporate support programs, coupled with technological reflectiveness and business moral values, in ESI behaviors. In doing so, our research complements the previous scholarship on the significance of ESI in managing contemporary operational challenges.

Our findings recognize time provision, budget provision, and advice provision as salient forms of corporate support programs that positively impact ESI behaviors. Our study further finds that technological reflectiveness positively moderates the link between time provision and managers' social innovation behavior while negatively moderating the link between advice provision and managers' social innovation behavior. This finding underlines the linkage between time and advice provision and managers' social innovation behavior in the presence of their reflectiveness on the implications of new technology in the workplace. We also find that business moral values positively moderate the nexus between time and budget provisions and managers' environmental innovation behavior and between budget and advice provisions and managers' social innovation behavior.

Our research is relevant for scholars interested in advancing knowledge on the drivers of managers' ESI behaviors. It offers unique insights into the moderating role of managers' technological reflectiveness and business moral values in translating corporate support programs into innovative solutions for tackling environmental and social challenges. It thus provides a holistic view of the intrinsic and extrinsic drivers of ESI behaviors in a unique context.

5.1. Theoretical implications

Our findings allow us to propose several contributions to OM research as one of the few studies specifically and jointly addressing environmental and social challenges through investigating ESI drivers and enablers (e.g., George *et al.*, 2016). There is burgeoning research on the role of OM strategy and practices in achieving environmental and social sustainability (Abdul-Rashid *et al.*, 2017; Ali & Gölgeci, 2020; Bendoly *et al.*, 2021; Dai *et al.*, 2015). However, our research is the first to establish the link between corporate support programs and managers' ESI behaviors and its boundary conditions through a scenario-based experiment. We explored the drivers of ESI behavior in the AFBI, because it has been argued that such innovations mitigate environmental and social challenges (Von Schomberg & Hankins, 2019).

First, we make a noteworthy contribution to the behavioral OM literature. Past OM studies have examined various aspects of managers' behaviors but offered few insights into the drives of managers' innovation behavior. Extant OM studies addressing drivers of innovation have primarily focused on what prompts firms to innovate, not managers (e.g., Cai and Lee, 2018; Dai *et al.*, 2015). We augment this stream of OM literature by shedding some light on a mix of factors extrinsic and intrinsic to individuals that influence managers' propensity to engage in innovation. Specifically, our results show that corporate support programs positively influence managers' ESI behaviors in the form of time provision, budget provision, and advice provision. Furthermore, we unpack the complexity of these relationships by examining the moderating effects of managers' moral values and managers' technological reflectiveness. As

such, we offer an initial platform on which behavioral OM studies can build to expand the scarce literature examining the factors that lead OM managers to innovate.

Second, we complement the research exploring the antecedents of environmental innovation. Past studies have found that environmental innovation can be facilitated by various factors, including research and development cooperation with suppliers (De Marchi, 2012), improvement of technological capabilities (Horbach, 2008), and interorganizational fit (Shou *et al.*, 2018). However, the extant studies have primarily explored innovation at the firm level. While past studies have focused on what drives firms to engage in environmental innovation (Borghesi *et al.*, 2015; De Marchi, 2012; Geffen & Rothenberg, 2000), our study examines what leads managers to engage in such desirable behaviors. As detailed above, our results show that time provision, budget provision, and advice provision positively and significantly impact managers' willingness to engage in environmental innovation. Our research indicates that businesses in the FBI could leverage support programs to help address environmental sustainability-related issues of climate change and protect ecosystems, with profound repercussions (Ali & Gölgeci, 2020; Tylecote, 2019). Our research also has implications for OM research, because it connects insights from corporate support programs and ensuing environmental innovation possibilities with firms' daily operations performed by their managers.

Third, we augment the literature on social innovation (Desmarchelier *et al.*, 2020; Hall *et al.*, 2012; Schweitzer *et al.*, 2015). Recent research underscores the significance of OM in achieving social sustainability (Tong *et al.*, 2018; Walker *et al.*, 2014). However, although social innovation has a long tradition in practice, there is a scarcity of empirical studies examining its behavioral drivers, primarily within the business literature (George *et al.*, 2019). To this end, our study explicates corporate support mechanisms that lead to managers' social innovation behaviors. The importance of understanding the factors that lead individuals to engage in social innovation has been underscored by the former president of the European

Commission, José Manuel Durão Barroso, who has recognized that “if encouraged and valued, social innovation can bring immediate solutions to the pressing social issues citizens are confronted with” (Hubert, 2012, p. 6). As such, we advance research on social sustainability in OM (Tong *et al.*, 2018; Walker *et al.*, 2014) by providing insights into how corporate support programs can be leveraged to promote managerial innovation behaviors to address the social challenges firms face. In particular, social innovations driven by support programs in the FBI could be utilized to address the social challenges of worldwide hunger (food security) and extreme poverty (cf. Lawrence, 2017).

Fourth, we complement the research examining the link between corporate support programs and innovation at large (Engelen *et al.*, 2018). We augment this research stream in a two ways. We offer a more specific perspective on the types of innovative manager behaviors support programs can facilitate by considering the environmental and social dimensions of innovation (Borghesi *et al.*, 2015; George *et al.*, 2019). Our study offers a more detailed perspective on the relationship between corporate support programs and managers’ innovative behavior by revealing how time provision, budget provision, and advice provision could be implemented in the FBI to stimulate managers to engage in ESI.

Fifth, we also expand the literature exploring the moderating role of technological reflectiveness in the linkages between corporate support programs and ESI behaviors (Andrade-Valbuena & Torres, 2018; Schweitzer *et al.*, 2015). Andrade-Valbuena and Torres (2018) found that technological reflectiveness increased individuals’ disposition to innovate, while Schweitzer *et al.* (2015) suggested that technological reflectiveness contributed to social innovation. Interestingly, our findings indicate that while a high level of technological reflectiveness strengthens the positive impact of time provision on social innovation behavior, the opposite effect occurs for the impact of advice provision on social innovation behavior: The positive relationship between advice provision and social innovation behavior is stronger at lower levels of technological reflectiveness. This unexpected finding highlights that the

interaction between intrinsic (e.g., technological reflectiveness) and extrinsic (e.g., corporate support programs) drivers in explaining social innovation behaviors could be more nuanced and dualistic than assumed. In particular, it reveals that some extrinsic drivers like advice provision may not be as effective as expected in the presence of specific intrinsic drivers like technological reflectiveness (e.g., Kuvaas *et al.*, 2017). It is possible that technologically reflective managers do not necessarily need a soft form of corporate support like advice provision, as they may already be cognizant of their business practices and the technologies involved in such practices. However, they may need more tangible support mechanisms like time provision to realize their innovative initiatives for social responsibility. Nonetheless, a further in-depth examination of the interplay between the intrinsic and extrinsic drivers of social innovation is needed to test these inferences.

Sixth, we make a noteworthy contribution to the literature on business moral values. Past studies have attributed several desirable consequences to moral values, such as organizational commitment, superior job performance (Jiang *et al.*, 2011), and greater pro-diversity behavior (Ng & Sears, 2020). We find that the positive impact of time provision and budget provision on environmental innovation is stronger for individuals with high business moral values. Likewise, we find that the positive impact of budget provision and advice provision on social innovation behavior is stronger for managers exhibiting higher moral values. Our study complements the literature on business moral values by revealing that business moral values strengthen the positive impact of time provision, budget provision, and advice provision on ESI. These findings also connect business moral values with ESI behaviors and showcase the potential relevance of business moral values to OM research, which has thus far paid only cursory attention to moral values and relevant concepts (Hill *et al.*, 2009). Our research thus helps bridge the disconnect between research on business ethics and OM, especially concerning the pressing issues of environmental and social sustainability.

Finally, our study contributes to the technological diffusion theory and the moral identity theory research streams (Eaton & Kortum, 1999; Hardy, 2017). Traditionally, when seeking to explain individual behavior within firms, including drivers of managerial innovation, scholars have resorted to the expectancy theory (Vroom, 1964) and the theory of planned behavior behaviors (Fishbein & Ajzen, 2011). Our findings help expand the scope of technological diffusion theory and moral identity theory by highlighting their ability to explain the innovation-related behavior of OM managers.

5.2. Managerial implications

Our findings also offer important insights for practitioners. The realization of socially and environmentally friendly business operations, alongside financial goals, has always been challenging for contemporary organizations. We find that a firm's manager, as a process owner, supervisor, and architect of new systems, can play a pivotal role in a firm's environmental and social pursuit. To this end, firms can stimulate managers' environmental and social innovative behaviors through corporate support programs, including the provision of required time, access to dedicated funds, and enlightenment or advice from the top managers. Specifically, our findings suggest that the firms that allow managers to devote some of their time to innovative projects present socially and environmentally safer operations. Given that innovation is a cost-oriented process, we find that the provision of funds to managers has a significant positive impact on their behaviors in undertaking environmental and social initiatives. That is, managers can leverage new work methods, techniques, or instruments to promote an idea and develop an actual product that causes little to no environmental footprint. Likewise, they can generate new ideas to address intricate social problems. Our findings also establish that a conducive corporate environment, with positive support and guidance from supervisors, is a key lever to stimulate managers' innovative behaviors to deal with societal and environmental problems. We therefore encourage firms to develop their corporate support program along the aforesaid directions.

In addition, firms should be aware that managers' own characteristics will influence the effectiveness of firms' support programs on ESI. Specifically, managers' technological reflectiveness plays an important role. Our findings show that the impact of providing time on social innovation behavior is stronger when managers have high technological reflectiveness. Yet, the impact of providing advice on social innovation behavior is stronger when managers have low technological reflectiveness: Providing time will be more impactful when offered to managers who reflect more on technology. Providing advice will be more impactful when offered to managers who reflect less on technology. Firms can utilize the measurement items provided in Table IV to assess their managers' levels of technological reflectiveness and determine the appropriate type of corporate support program.

Moreover, considering that firms might have limited resources to devote to their corporate support programs, our findings indicate that managers might be able to prioritize their offerings to maximize managerial innovation. Specifically, our findings suggest to managers that while all three types of corporate support programs positively impact ESI, time provision and budget provision are similar in effect and more effective than advice provision. Thus, if limited resources are available, we recommend that managers prioritize time and budget provisions over advice provision.

Furthermore, managers' moral values amplify the positive impact of providing time, budget, and advice on managers' ESI behaviors. Firms can utilize the measurement items provided in Table IV to assess their managers' levels of business moral values. If these levels are low, firms are advised to implement training programs geared to educate managers on issues relating to moral values. In addition, firms can also seek to assess their prospective managers' moral values, gauge them as part of the hiring process, and preferably hire managers displaying high moral values.

Finally, the study's data were gathered from senior managers from the AFBI. The FBI is among the major and increasingly vital industries worldwide. Managers within this global

industry can therefore apply our recommendations, though with some minor contextual modifications within this critical and dynamic industry.

5.3. Limitations and future research

Our study is not free of limitations. First, we conducted our study in the context of the AFBI. While this focused approach allowed us to test the results with a homogenous sample in an increasingly important context, future studies should attempt to test the effects observed in this study in other industries to better establish the findings' generalizability.

Second, we examined the impact of three types of corporate support programs on ESI behaviors. Future studies should explore whether additional support programs could be designed to stimulate these desirable behaviors. Specifically, we recommend that future studies engage in qualitative interviews with firm managers and assess what support programs managers believe would help them better engage in such behaviors.

Third, we considered the moderating roles of technological reflectiveness and business moral values. Future studies should assess whether additional individual-level factors, such as managers' creativity, self-efficacy, or innovation proclivity, could moderate the link between corporate support programs and ESI.

Finally, scenario-based experiments exhibit higher internal validity due to reduced complexity in linking independent and dependent variables (Aguinis & Bradley, 2014). However, they can be limited in terms of external validity (Salonen *et al.*, 2021). Future studies could triangulate our research through alternative methods. For example, field experiments could be applied to gain insights into actual behavior stemming from intervention, or secondary data on firms implementing various support programs could be used to enhance research generalizability.

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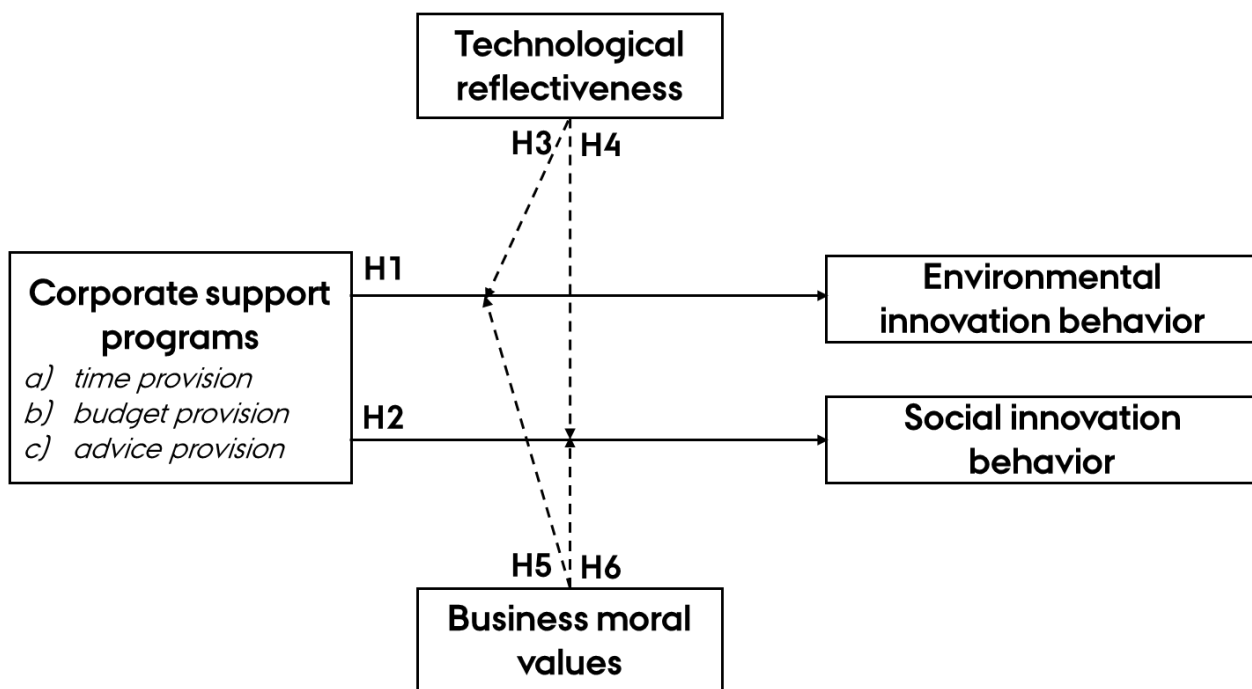


Figure 1. Conceptual framework

Figure 2. Depiction of moderation effects

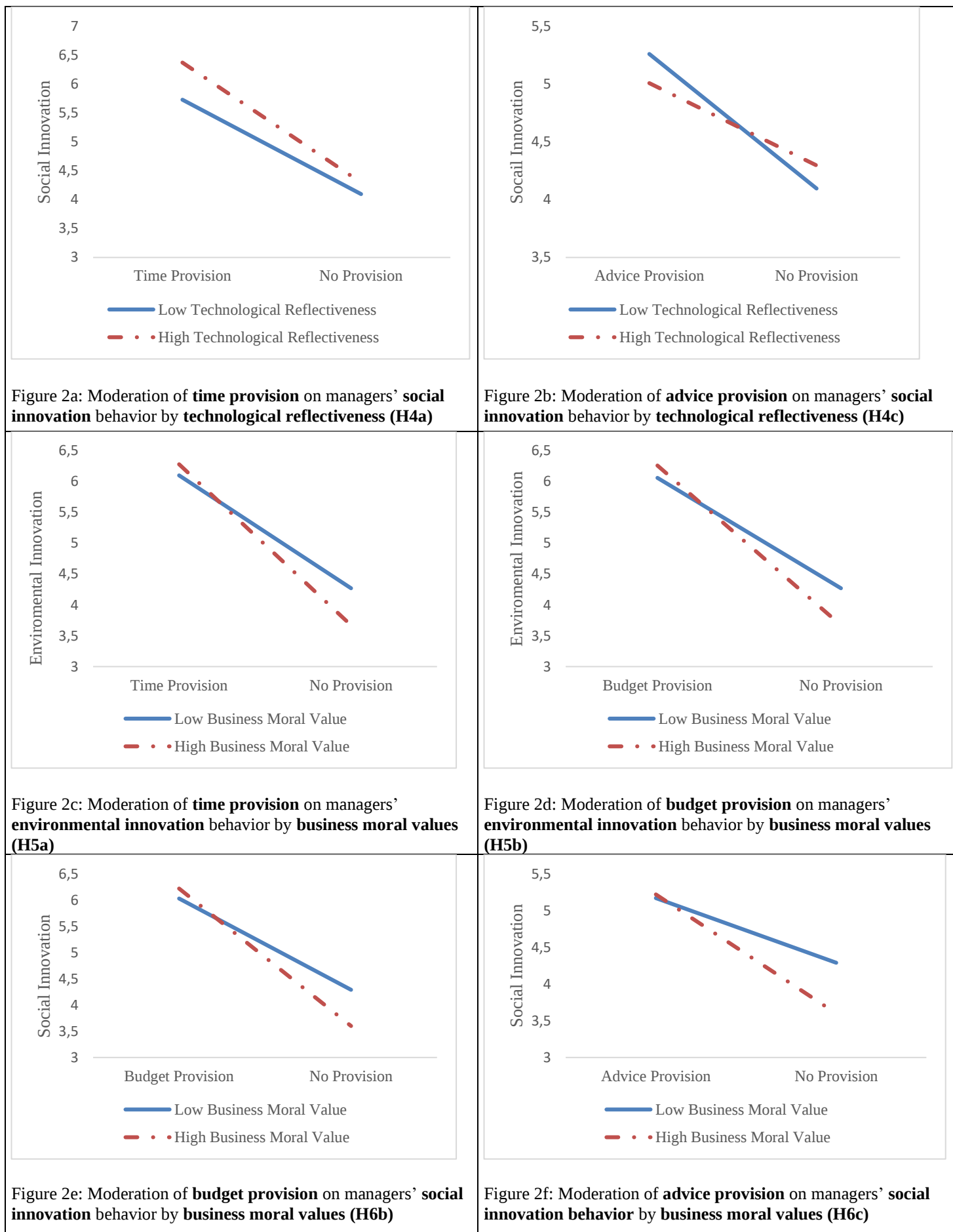


Table I. Overview of the relevant innovation literature concerning operations and supply chain management.

Publication	Literature stream			Primary research objective(s)	Key construct(s)	Key finding(s)
	Environmental innovation	Social innovation	Innovation in behavioral operations			
Current Research	X	X	X	Investigate the influence of corporate support programs on managers' environmental and social innovativeness; explore the moderating role of managers' technological reflectiveness and business moral values.	Environmental innovation; social innovation; corporate support programs; technological reflectiveness; business moral values.	Time provision, budget provision, and advice provision lead managers to engage in ESI; technological reflectiveness positively moderates the link between time provision and managers' social innovation behavior while negatively moderating the link between advice provision and managers' social innovation behavior; business moral values positively moderate the relationship between time and budget provisions and managers' environmental innovation behavior, and between budget and advice provisions and managers' social innovation behavior.
Geffen and Rothenberg (2000)	X			Examine the role of partnerships between OEMs and their suppliers in improving the environmental performance of manufacturing operations.	Innovative environmental technologies; environmental performance; partnerships.	Strong partnerships with suppliers, supported by appropriate incentive systems, contribute to the successful application of innovative environmental technologies. Supplier staff members are important for achieving environmental performance while keeping production quality high and costs low.
Verghese and Lewis (2007)	X			Investigate environmental innovation in industrial packaging.	Environmental innovation; industrial packaging; supply chain.	Environmental innovation is contingent on a cooperative supply chain approach.
Lee <i>et al.</i> (2011)			X	Examine how human, structural, and social dimensions of intellectual capital influence the technical success of manufacturing process innovation	Worker expertise; information sharing quality; psychological safety work; process innovation	Distinct dimensions of intellectual capital distinctly impact manufacturing process innovation. Incrementalness of a manufacturing process innovation project moderates the relationship between worker expertise and manufacturing process innovation performance
De Marchi (2012)	X			Explore the relationship between firms' R&D cooperation strategies and environmental innovation.	Environmental innovation; R&D cooperation strategies.	Environmental innovative firms cooperate more with external partners than other firms.

Hutchison-Krupat and Chao (2014)		X	Investigate how tolerance for failure and incentives influence the individuals' decisions in collaborative innovation initiatives	Tolerance for failure; incentives; collaborative innovation	When penalties are low, the extent of risk-taking is mostly insensitive to the offered rewards. When individuals make decisions alone instead of collaboratively, higher tolerance for failure does not sufficiently increase risk-taking.
Dai <i>et al.</i> (2015)	X		Examine how the perception of rival firms' green success influences environmental innovation	Green product development; green production development; environmental innovation	Green supply chain integration positively impacts developing incremental environmental innovation. Customer integration positively impacts developing radical environmental innovation.
Schweitzer <i>et al.</i> (2015)		X	Identify technologically reflective individuals and demonstrate their ability to develop social innovation	Social innovation; technological reflectiveness	Individuals' degree of technological reflectiveness is positively related to their ability to generate more features with higher levels of societal impact.
Cai and Li (2018)	X		Shed light on the drivers of environmental innovation and the impact on firm performance.	environmental innovation; drivers; performance.	Technological capabilities, competitive pressures, a market-based instrument, environmental organizational capabilities, and customer green demand promote the development of environmental innovation.
Shou <i>et al.</i> (2018)	X		Develop a taxonomy of focal firms' interorganizational fit configurations with their suppliers and customers, and examine the relationship between these configurations and environmental innovation	Interorganizational fit; environmental innovation; configuration	The overall interorganizational fit level is positively related to firms' environmental innovation. Interorganizational complementarity facilitates incremental environmental innovation, while interorganizational compatibility plays a more crucial role in radical environmental innovation.
Wuttke <i>et al.</i> (2018)		X	Investigate how innovation projects' characteristics influence individuals' decision to accept and continue innovation projects	Project revenue; type of cost uncertainty; contract frame; innovation project acceptance	Acceptance rates increase when projects have a low real options value or an entirely new revenue stream. Continuation rates increase if the same person makes acceptance and continuation decisions. Using a reward frame for sustaining supplier engagements increases acceptance rates.
Kalkanci <i>et al.</i> (2019)		X	Examine the role of inclusive innovation in promoting social sustainability	Inclusive innovation; social sustainability	Successful innovation for social sustainability requires the collaboration of for-profit firms with the public sector, civil society organizations, and communities.
De Silva <i>et al.</i> (2020)		X	Investigate the role of co-creation in social innovation.	Social innovation; co-creation.	Firms co-create opportunities to generate social and economic value simultaneously.

Table II. Study scenario

Introductory scenario

The following introductory scenarios were presented to all participants:

You have been employed at your current employer, a firm called Sindcom, for the last four years. The firm is in the food and beverage industry. Based on your extensive interactions with people from other units, you have a good overview of the entire firm. A lot has changed during the last few years in your firm's market and environmental conditions. The food and beverage industry, and your firm in particular, has become more vulnerable to environmental problems like climate change, pollution, and increasing natural disasters, as well as to social problems like labor shortages due to urbanization and income inequality. Your firm feels the heat of these grand challenges and is struggling to find innovative solutions to address environmental and social problems while keeping financially afloat.

Sudden Emergence of a New Situation

You have recently notified of an opportunity to participate in a collaborative project to develop and implement innovative solutions to tackle environmental and social problems your local community faces. This is a major undertaking and is likely to take most of your time and effort for several months onward. You recognized that the project you will be involved in could make a difference to your community in terms of both ecology and society and can bring side benefits to Sindcom as part of the solution. Thus, you believe there is big potential both for your firm and for the community. You believe you have both ideas and devotion to tackle the environmental and social challenges your community faces. In fact, you already sketched some tentative solutions that could be tested and implemented collaboratively.

After reading this introductory scenario, each participant was randomly assigned to one of the following scenarios:

Conditions**1- No Support Condition**

Your immediate supervisor does not actively support the abovementioned innovative initiatives. If you want to develop novel ideas for new innovative solutions to address your community's environmental and social problems, you can do so after hours on your own and at your expense.

2- Time Provision Condition

To encourage innovation, your immediate supervisor informs you that a new corporate policy allows you to spend 30% of your worktime on your innovative projects. Your other regular responsibilities are reduced accordingly.

3- Budget Provision Condition

To encourage innovation, your immediate supervisor informs you that a new corporate policy allows you to apply for and obtain a specific budget (including financial resources and other team members with required expertise) to develop and implement your own innovative ideas for tackling local environmental and social problems.

4- Advice Provision Condition

Your immediate supervisor informs you that you have his or her support just in terms of advice within the firm when you have good, innovative ideas that you would like to develop, test, and implement to tackle local environmental and social problems.

Table III. Demographic properties

	Frequency	Percentage
Gender		
Male	178	80.9%
Female	25	11.4%
Prefer not to say	17	7.7%
Age		
2029	4	1.8%
3039	35	15.9%
4049	127	57.7%
5059	50	22.7%
6069	3	1.4%
≥70	1	0.5%
Combined Annual Household Income		
Less than 30K	1	0.5%
30,00039,999	2	0.9%
40,00049,999	-	-
50,00059,999	2	0.9%
60,00069,999	-	-
70,00079,999	-	-
80,00089,999	-	-
90,00099,999	60	27.3%
100K or more	155	70.5%
Highest Completed Education		
Less than 7 th grade	-	-
Less than High School	-	-
High School/GED	-	-
Some College	14	6.4%
2-Year College Degree	20	9.1%
4-Year College Degree	138	62.7%
Master's Degree	47	21.4%
Doctoral Degree	1	0.5%
Professional Degree (JD, MD)	-	-
Your Business Category		
Famer/grower	6	2.7%
Food processor/manufacturer	127	57.7%
Food packer/packaging firm	54	24.5%
Wholesaler	2	0.9%
Transporter (transport service provider)	1	0.5%
Retailer	5	2.3%
Other	25	11.4%
How long are you in the current position?		
Less than 1 year	3	1.4%
15 Years	7	3.2%
5-0 Years	35	15.9%
More than 10 years	175	79.5%

Table IV. Constructs, items, and reliability

Constructs	Items	Reliability Cronbach's Alpha
Environmental innovation behavior	<i>1=Strongly Disagree, 7=Strongly Agree</i> 1-I would be highly engaged in generating new solutions to develop an environmentally friendly new product. 2-I would create new ideas and develop an actual product that causes little to no pollution to natural resources (water, land, air). 3-I would search out new work methods, techniques, or instruments to promote my ideas and develop an actual product that causes little to no environmental footprint (e.g., greenhouse gas emission, waste). 4-I would transform my innovative ideas into useful actual applications and products which have the least negative impact on climate. 5-I would evaluate the utility of my innovative ideas for the natural environment.	0.97
Social innovation behavior	<i>1=Strongly Disagree, 7=Strongly Agree</i> 1-I would be highly engaged in generating new ideas to address social problems (e.g., unemployment, income inequality, education, healthcare). 2-I would be highly engaged in generating new ideas to support the community. 3-I would search out new work methods, technologies, or instruments that are beneficial for the current and future generations. 4-I would focus on developing a new product that supports public health. 5-I would transform my innovative ideas into useful actual applications and products that positively impact society. 6-I would be engaged to create new processes and routines that meet social needs better than the existing solutions. 7-I would evaluate the utility of my innovative ideas for society.	0.98
Technological reflectiveness	<i>1=Strongly Disagree, 7=Strongly Agree</i> 1-I enjoy thinking about the changes and risks a new technology might provide and harbor for society. 2-I am very interested in studying the impact that new technical products have on society. 3-When I hear about a new technical product, I have spontaneous ideas on how this product can be used to reduce social problems. 4-I enjoy thinking about the impact that new technical products have on different social groups (e.g., the elderly, the young, and the chronically ill). 5-When I hear that a new technical product is on the market, I immediately reflect on the consequences this product may have for society. 6-I enjoy thinking about how future technology could change our society. 7-I am often thinking about how technical products could impact the autonomy and self-determination of individuals and social groups.	0.93

Business moral values*	<i>1=Strongly Disagree, 7=Strongly Agree</i> 1-Not exposing a supervisor's illegal behavior in the company. 2-Not exposing a colleague's illegal behavior in the company. 3-Giving gifts or benefits to a supplier to garner favorable treatment. 4-Currying favor with the employee of a competitor to acquire information that benefits only you. 5-Gossiping, dozing off, or being absentminded during working hours. 6-Procrastinating and not doing your best to accomplish your work. 7-Doing work carelessly in order to leave early. 8-Taking credit for a subordinate's work. 9-Attributing your faults to colleagues. 10-Starting rumors and calumniating those colleagues you think may want your position. 11-Using company time for personal business. 12-Copying corporate software for your personal use. 13-Appropriating corporate sources (e.g., other employees, money, and objects) for personal use. 14-Using cheaper components for a supplier's order instead of those requested to be used in the contract. 15-Concealing minor quality problems in order to merchandise.	0.90
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*All items are reverse-coded for *business moral values* scale

Table V: Overall hypothesis results

Hypothesis	Supported	Overall Supported?
H1: The provision of a) time, b) budget, and c) advice through corporate support programs will have a positive impact on managers' environmental innovation behavior.	H1a, b, c are supported.	Yes
H2: The provision of a) time, b) budget, and c) advice through corporate support programs will have a positive impact on managers' social innovation behavior.	H2a, b, c are supported.	Yes
H3: Managers' technological reflectiveness positively moderates the impact of a) time provision, b) budget provision, and c) advice provision on their environmental innovation behavior.	H3a, b, c are not supported.	No
H4: Managers' technological reflectiveness positively moderates the impact of a) time provision, b) budget provision, and c) advice provision on their social innovation behavior	H4a is supported. H4b is not supported. H4c is not supported.	Partially supported.
H5: Managers' business moral values positively moderate the impact of a) time provision, b) budget provision, and c) advice provision on their environmental innovation behavior.	H5a is supported. H5b is supported. H5c is not supported.	Partially supported.
H6: Managers' business moral values positively moderate the impact of a) time provision, b) budget provision, and c) advice provision on their social innovation behavior.	H6a is not supported. H6b is supported. H6c is supported.	Partially supported.

Note: The significance level is set at 0.10.