

Environmental Decision Making in Small Companies: a Behavioral Economics Perspective

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Abstract

Small and medium-sized enterprises (SMEs) are often considered the backbone of the economy. Indeed, in most economies around the world, SMEs are the largest group of companies and they are responsible for a substantial share of economic output and resource use. Sustainability-related decisions and the environmental management in SMEs are thus key factors to consider in order to increase the environmental sustainability in an economy. However, SMEs often do not have the capabilities and the knowledge that would be required to implement best practices in environmental management. Moreover, because of their smaller size, behavioral motivations and “biases” in decision making may be more important in SMEs than in larger companies. Such factors might be relevant for the effectiveness of public policy measures directed at SMEs and they make SMEs potential targets for policy instruments from the behavioral economics toolkit, such as “nudges” or other measures. This chapter focuses on three elements of behavioral motivations and decision making that are relevant for SMEs—social preferences, present bias, and loss aversion—and discusses how they can affect environmental management and sustainability-related decisions in SMEs. The chapter finally considers to what extent behavioral economics approaches could be helpful for fostering more sustainable management practices in SMEs by addressing these behavioral elements of decision making in SMEs.

Keywords: SMEs, environmental management, sustainability, decision making, social preferences, present bias, loss aversion, nudging, behavioral economics, behavioral management

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1 Introduction

Understanding and potentially improving the environmental decision making in small and medium-sized enterprises (SMEs) is of great importance. SMEs are often considered the backbone of the economy, as in many economies a majority of workers is employed by SMEs and a large part of value creation occurs in SMEs. In the European Union, for instance, 99.8% of all companies are estimated to be SMEs and 66.3% of the workforce is employed in a SME. Moreover, SMEs are responsible for an estimated 55.8% of the economic turnover in the European Union in a given year (Eurostat, 2015). Importantly, SMEs, in contrast to larger companies, may often lack the awareness, knowledge, and capabilities necessary to undertake socially and environmentally responsible actions without guidance (e.g., Tilley, 1999; Schmitz and Schrader, 2015). Indeed, there is evidence that sustainability-related management practices are more prevalent in larger firms than in smaller ones (Brammer and Millington, 2006; Gallo and Christensen, 2011) and that this gap is driven by a lack of knowledge about best practices in sustainability management (Hörisch et al., 2015). SMEs are thus relevant targets of public policy tools aimed at promoting the sustainable use of resources and a more sustainable economy in general.

This chapter discusses how decisions to implement environmental management practices in SMEs may be shaped by behavioral elements in the decision making process of SMEs, and how the spread of best practices in environmental management can be fostered by designing policy tools that take such behavioral elements in SME decision making into account. According to Montabon et al. (2007), environmental management practices “... are the techniques, policies and procedures a firm uses that are specifically aimed at monitoring and controlling the impact of its operations on the natural environment” (p. 998). This is a broad but useful definition that is applicable to many different industries and types of SMEs and thus fitting given the diversity of SMEs in most economies. Of course, the idea is that sustainable environmental management does not stop at “monitoring and controlling,” but that best practices in environmental management lead to a reduction in the use of scarce natural resources, a reduction in pollution and harmful emissions (such as, for example, CO_2), and in general to a reduction in the environmental footprint caused by SMEs’ operations. Fostering the adoption of environmental management practices in SMEs can thus contribute to increasing overall sustainability in the economy. Moreover, it could also be beneficial for SMEs, as good environmental management practices are positively associated with firm performance (Montabon et al., 2007).

Yet, as will be discussed in more detail later in this chapter, the business case for implementing environmental management practices is not straightforward for SMEs. Whereas the implementation cost may often not be very large, the returns are also often not very clear. Compared to larger firms, SMEs have less to gain economically from being at the forefront of implementing Corporate Social Responsibility (CSR) measures such as environmental management practices. SMEs often serve smaller markets and are less visible, which makes image considerations less important to them. For the same reason, they also have less to fear in terms of public scrutiny or pressure by groups of environmental or social activists (see, e.g., Lynch-Wood et al., 2009).

The lack of a clear business case for implementing CSR or environmental management practices in SMEs has led some authors to conclude that a reliance on voluntary approaches, i.e., companies freely deciding to adopt environmental management or other CSR practices, cannot be successful. Instead, these authors argue that tougher command and control regulation or appropriate financial incentive schemes have to be implemented (e.g., Lynch-Wood et al., 2009). However, such regulatory approaches and their market-based alternatives (for instance, emissions trading) are politically often difficult to implement, at least with the required strength and urgency. They may take a long time to pass through the political process, and along the way, regulation or other schemes designed to decrease the negative environmental impacts of economic activity are often in danger of being watered down by industry interest groups who manage to successfully lobby relevant decision makers.

This chapter develops an alternative perspective. By considering behavioral elements in the decision making and the motivation of SMEs and moving away from the neo-classical paradigm of pure rational maximization of monetary profits, it is argued that the voluntary approach may actually be more successful than what may be expected when considering only pure business case arguments. Specifically, there is evidence that—like many individual consumers and citizens—many relevant decision makers in SMEs also have social or moral preferences that lead them to want to improve the environmental performance of their companies, and that such motives do shape the decision making in SMEs.

The question then becomes how to activate and foster such tendencies. Policy instruments building on and applying insights from behavioral economics seem particularly appropriate for this purpose. The aim of such interventions is to reduce negative environmental impacts of economic activity by encouraging alternative, less harmful practices or behaviors when traditional policy instruments (e.g., taxes, subsidies, or command and control regulation) are not feasible (see, e.g., Croson and Treich, 2014). In addition, behavioral biases, such as present bias or loss aversion, which will be discussed in detail in this chapter, may cause SMEs to miss taking certain environmental actions that are actually in their direct financial interest. Taking such potential biases into account can help increase the effectiveness of policy instruments designed to increase the environmental sustainability of SMEs.

Successful behavioral economics interventions typically build on insights about specific behavioral features of human decision making or motivation. A prominent example, but not the only one, are “nudging” approaches (Thaler and Sunstein, 2008). Nudging strategies involve, for instance, the deliberate use of specific decision frames, the provision of information about social norms or others’ behavior, or the making salient of different kinds of information. Many such interventions have been successfully used to influence the behavior of individuals (see, e.g. Lehner et al., 2016; Byerly et al., 2018; Carlsson et al., 2019, for overviews). To date there is, however, little direct evidence or experience available on whether similar approaches can also be successful when targeted at companies, for instance, SMEs.

The current chapter argues that behavioral interventions could also be used to successfully

trigger the spread of environmental management and other sustainability related practices in SMEs. To do so, the following Section 2 first describes and reviews the evidence on three relevant behavioral facets of human decision making and motivation, namely social preferences, present bias, and loss aversion. Section 3 then discusses how these behavioral elements are relevant for environmental decision making in SMEs, and how behavioral interventions—nudges and others—could be used to foster the proliferation of environmental management practices in SMEs.

2 Behavioral Elements of Environmental Decision Making

For a long time the economic perspective on socio-economical and environmental problems was determined by neoclassical economic theory. This traditional perspective relies on the assumptions of full rationality and pure self-interest motivation as drivers of human decision making. These assumptions are clearly debatable and seem unrealistic to many people. Although, despite relying on these seemingly strong assumptions, many predictions derived from neoclassical models are correct, some important ones, especially with respect to decision making in the environmental and sustainability domain, are not. To start with a very simple example from the environmental domain, consider the so-called “energy efficiency gap.” Classical economic theory, would predict that economic decision makers should prefer a more energy-efficient device (for instance an energy-saving lamp) to a less efficient device (for instance a traditional lamp) if the total cost of ownership (consisting of the purchase price and the usage cost of energy over the life cycle of the device) is significantly lower. In reality, consumers and firms do not seem adopt such more efficient new technologies as swiftly as would be expected based on the behavioral assumptions of neoclassical economics (see, e.g., Schubert and Stadelmann, 2015; Frederiks et al., 2015). In response to such shortcomings, behavioral economists have tried to improve the predictions of economic models by incorporating psychological and other factors and thus bringing the models and their assumptions closer to reality.

Specifically, research in behavioral economics (and related disciplines such as psychology, sociology, and neuroscience) has documented that human decision making does not correspond to the above outlined assumptions of neo-classical economics in several respects. Some of these deviations are particularly important for decision making in the environmental domain. This chapter focuses on three examples of such deviations and discusses their importance for environmental decision making first of individuals and then of SMEs: social preferences (sometimes also called other-regarding preferences), present bias, and loss aversion or reference dependence (see, e.g., Gsottbauer and Van den Bergh, 2011, for an overview discussing also further topics from the behavioral economics literature that are relevant for environmental decision making). The focus on these three facets is warranted because their prevalence in individual decision making is empirically well documented and it is theoretically relatively well understood how they work. Moreover, research on social preferences, present bias, and reference dependence has been used to design behavioral policy interventions, for instance, in the form of “nudges,” that have been successfully applied to

increase the sustainability of environmentally-related decisions of individuals. Importantly, as will be outlined in Section 3, there are reasons to believe that these forces are also relevant for environmental decision making in SMEs and that similar interventions may therefore also be successful when targeted at SMEs.

In behavioral economics and elsewhere, some of these empirically documented deviations of human decision making from the neoclassical assumptions are often called behavioral “biases.” Note that this term seems not ideal, because it insinuates that such deviations always constitute mistakes. That is a strong assumption itself, however. Indeed, some cognitive psychologists such as Gerd Gigerenzer argue that most of these empirically observable patterns of human decision making that have been labeled “biases” are not biases as such but adaptive functions of human cognition that often lead to good decisions in many real-world decision environments (see, e.g., Gigerenzer and Brighton, 2009; Gigerenzer, 2018). In the case of social preferences, it seems clear that they cannot be labeled a bias as they simply constitute a different form of personal preferences, including also concern for others and not only concern for the self. For reference dependence and present bias the arguments become more difficult, as both can lead to choice patterns such as choice reversals that imply that individual decision makers, at least at some points in time, do not make optimal choices as judged by themselves (see, e.g., Allais, 1953 or Tversky and Kahneman, 1981 for the case of reference dependence and O’Donoghue and Rabin, 1999 or Frederick et al., 2002 for the case of time preferences and present bias). Resolving the tension between these perspectives is beyond the scope of this chapter, and the term “bias” is used where it is common in the behavioral economics literature, in order to avoid creating confusion by having to coin a new term. Note, however, in the spirit of the above argument, that the term “bias” does certainly not always imply mistake.

Nevertheless, especially in the environmental domain, people often seem to make choices that are not in line with their moral convictions or even with their financial interests. Proponents of choice architecture and nudging interventions argue that some such problems can be overcome by designing appropriate choice architecture interventions or nudges (e.g., Thaler and Sunstein, 2003). A growing number of empirical studies support the claim that choice architecture tools can impact economic outcomes in a desirable way. They can, for instance, help reduce the problem of under-saving for retirement (e.g., Chetty et al., 2014; Thaler and Benartzi, 2004) or can be effective in the promotion of public goods such as charitable giving (e.g., Altmann et al., 2018) or organ donation (e.g., Johnson and Goldstein, 2003). Most directly related to the topic of this chapter, empirical evidence shows that interventions from the toolkit of behavioral economics can be helpful for people to achieve goals they have troubles to reach otherwise, for instance, to act more environmentally-friendly (see, e.g., Allcott and Mullainathan, 2010; Croson and Treich, 2014, for overviews with regard to environmentally relevant behaviors).

To provide a basis for discussing these issues in the context of environmental decision making in SMEs, the following three subsections briefly review the evidence for the importance of social preferences, present bias, and loss aversion on individual decision making in the environmental domain. They also discuss potential public policy applications of these topics in terms of nudging

or other behaviorally informed interventions. Even though the explicit link to SME decision making is left to Section 3, the goal is to outline important facets of human decision making and motivation that are relevant not only for individuals but also potentially in a SME context.

2.1 Social Preferences

Whereas in other disciplines the importance of not directly self-interested decision motives such as altruism or reciprocity has been discussed and acknowledged since a long time (e.g., Gouldner, 1960), in economics this perspective has been taken up only later (see, e.g., Akerlof, 1982, as a prominent early example related to Gouldner). Because of the strong traditional reliance on the selfish homo oeconomicus model, the idea that people may not only care about their own payoffs and utility but also about others' payoffs and utility has been put under intense empirical scrutiny, which has produced many insightful and influential papers (e.g., Güth et al., 1982; Andreoni, 1990; Fehr et al., 1993; Fehr and Gächter, 2002). By now, the study of altruistic motives and their manifestations, for instance in charitable giving, is a well-established and very active field in (behavioral) economics (e.g., DellaVigna et al., 2012; Schmitz, 2019), as is the experimental study of cooperation in public goods games, where social preferences can help achieve cooperation and thus overcome the stark predictions of the neo-classical homo oeconomicus model (see, e.g., Chaudhuri, 2011, for an overview of the literature on laboratory public goods experiments).

Social preferences are clearly important for environmental or ecological decision making (e.g., Gintis, 2000). A clean environment is a public good. The decision to take voluntary action to reduce one's personal environmental footprint can thus be seen as accepting personal costs—for instance, in the form of forfeited consumption or a reduction in comfort—in order to contribute to the public good of protecting the environment. Correspondingly, recent evidence shows that measures of an individual's degree of social preferences (in the form of altruism) are significant predictors of pro-environmental behavior in daily life (Lades et al., 2020).

Much research at the intersection of behavioral, experimental, and environmental economics has taken on such a public good perspective to study environmental behavior and decision making and to test the effects of different institutional arrangements on such behaviors (see, e.g., Sturm and Weimann, 2006). One of the most prominent findings in the public goods literature is that many people are conditional cooperators, i.e., that they are willing to contribute to a public good as long as others contribute too, even though individual rationality would prescribe a selfish decision-maker never to contribute (see, e.g., Fischbacher et al., 2001; Frey and Meier, 2004). This conditional cooperation tendency can be leveraged in behavioral policy interventions, for instance, by providing people information about (positive) examples of other people who also act environmentally-friendly or by communicating descriptive norm information about how many other people already act in a certain way (e.g., Demarque et al., 2015).

Another more direct route for triggering social preferences to foster pro-environmental decisions is to appeal to people's moral or altruistic motivations. For instance, Bolderdijk et al. (2013) find that environmental campaigns speaking to people's moral motives are more effective than campaigns

that highlight positive monetary effects (see also Frey and Oberholzer-Gee, 1997).

In sum, social preference are highly relevant determinants of pro-environmental behavior. Considering such motives offers several leverage points for policy instruments or campaigns trying to foster individual pro-environmental behaviors.

2.2 Discount Rates and Present Bias in Intertemporal Choice

Intertemporal decisions, in which a decision maker has to make a utility trade-off between at least two different points in time, an earlier and a later one, are very important in many economic domains in general (e.g., for all kinds of investment decisions) and in the environmental domain in particular (Hardisty et al., 2012). For instance, one of the most decisive—and often also most contested—variables for determining the social cost of climate change or, reversely, the net benefit of measures for acting against climate change, is the intertemporal discount rate. The discount rate captures the value of future costs and benefits in relation to the value of costs and benefits in the present (e.g., Arrow et al., 2013). A low discount rate means putting a lot of weight on the present and little weight on the future, whereas a high discount rate means the opposite. Even though there can be heated debates on the appropriate value the applied discount rate should take in specific intertemporal cost-benefit calculations, given a certain discount rate, it is in theory well understood how rational decision makers should optimally make these trade-offs between two points in time.

It has become more and more clear, however, that in their real-life decisions, people often do not follow these prescriptions of rationality when making intertemporal choices. For instance, when comparing the implicit discount rates calculated in empirical studies analyzing data on actual intertemporal choices by experimental participants, Frederick et al. (2002) found that the estimates differed systematically when choices involved the present compared to when they involved only comparisons between two future points in time. When the choice involved the present, estimated implicit discount rates were sometimes extremely low, indicating that people put an extremely high value on the present, to the detriment of the future.

This finding constitutes the essence of present bias (see O’Donoghue and Rabin, 1999, for a simple theoretical model capturing this phenomenon). Present bias can give rise to preference reversals that are best illustrated in a stylized example. Imagine a decision maker who needs to decide today, whether she prefers to receive (a) 100 \$ in 30 days or (b) 110 \$ in 31 days. Imagine also that the decision maker finds this an easy choice and quickly decides that she prefers option (b) and thus wants to receive 110 \$ in 31 days. Now imagine that 30 days have passed, and that the same decision maker is asked again whether she wants to receive (a) 100 \$ today or (b) 110 \$ tomorrow. If the decision maker acts in accordance with the rationality prescriptions of the homo oeconomicus model, she needs to stick to her decision from 30 days ago and still prefer to wait one day until tomorrow to receive the 110 \$. However, for most people it is probably easy to comprehend how the temptation to receive 100 \$ immediately now makes this a much harder choice and could lead the decision maker to revise her decision and to prefer option (a) over option (b). If she actually does so, and reverses her initial choice, this would be giving in to present bias.

Both the discount rate in the sense of the neo-classical model, as well as present bias from behavioral economics in the sense outlined above, are relevant when it comes to environmental decision making. For instance, as discussed above, measures against climate change only seem worthwhile if the assumed discount rate is high enough. Only then does it make sense to accept a cost in the present, e.g., in the form of lower economic output, in order to take measures that limit the damage done by climate change in the future. The behavioral phenomenon of present bias exacerbates this problem and makes taking action against climate change (or in favor of other related long-term environmental goals) even less likely (e.g., Weber, 2010). A prominent example at the level of individual consumer decisions is the energy efficiency gap in the purchasing of energy-using durable goods, such as, e.g., fridges, TVs, etc. Consumers seem to shy away from paying slightly higher purchase prices for more energy-efficient devices, even when the energy savings would make paying the higher price financially worthwhile over the life cycle of the purchased good (see, e.g., Schubert and Stadelmann, 2015). Lillemo (2014) provides direct evidence that such behavior is linked to individual consumers' degree of present bias.

Most examples of nudging or choice architecture interventions that target problems related to present bias or very low discount rates (signifying impatience and a low weight on future outcomes) come from non-environmental domains. A by now famous illustration is the “Save More Tomorrow” program developed and tested by Thaler and Benartzi (2004) that targeted the problem of undersaving for retirement on the part of many employees in the U.S. They offered employees in defined contributions retirement savings plans (so-called 401k plans) the option of committing themselves in the present to increase the savings rate at a later point in time, thus effectively—at the moment of the decision—putting the cost of saving in the future. Putting the cost in the future makes it seem smaller for a present-biased decision maker who will thus be more likely to agree to increasing her contributions. Variants of such voluntary commitment devices have also been shown to be effective for increasing effort in work settings (Ariely and Wertenbroch, 2002; Kaur et al., 2010). Similarly, Milkman et al. (2014) have shown that the negative effects of immediate costs can be offset by bundling them with additional immediate benefits, which can successfully increase people's motivation to exercise (Milkman et al., 2014).

In sum, it seems clear that many environmental behaviors are importantly affected by present bias and discounting. Policy interventions that are designed to take present bias into account could therefore be particularly effective in fostering sustainability and pro-environmental decision making.

2.3 Loss Aversion and Reference-Dependent Preferences

One of the most prominent findings in behavioral economics is the existence of loss aversion. Loss aversion describes the phenomenon that (potential or actual) losses seem to influence people's decision making more strongly than gains. For a loss-averse decision maker, the decrease in perceived utility caused by a loss is greater than the increase caused by a gain of the same magnitude.

Kahneman and Tversky (1979) have formulated their influential prospect theory to take this disparity into account. According to prospect theory, a decision maker always evaluates the attractiveness of a certain option with respect to a reference point. The reference point is potentially arbitrary and can therefore be influenced by the framing of the decision or other environmental cues (that can potentially be manipulated). Moreover, according to prospect theory, decision makers evaluate the outcome of a decision on an *s*-shaped value function. Importantly, to capture loss aversion, the value function is steeper for losses than for gains. Additionally, prospect theory also features a probability weighting function for choices under uncertainty, according to which decision makers over weight very small probabilities. In this chapter the focus is mostly on loss aversion and reference dependence, which are driven by the value function, even though biases in probability weighting are, of course, also potentially relevant for environmental decision making.

The stronger negative impact of losses on perceived utility compared to the positive impact of gains of the same size makes loss-averse individuals wanting to avoid losses relatively more than they want to realize gains. This can be used, for instance, as a motivating force to elicit effort in work settings (see, e.g., Abeler et al., 2011; von Bieberstein et al., 2020). Moreover, because losses are always defined in relation to the reference point, and because reference points are somewhat arbitrary and susceptible to outside influences, people's decisions can change as a function of how the relevant information is presented to them. Indeed, substantial evidence demonstrates that people react more strongly to decision situations presented in a loss frame rather than in a gain frame (see e.g., Kahneman and Tversky, 1979; Tversky and Kahneman, 1981, 1989; Kahneman, 2003).

Moreover, loss aversion makes people risk seeking in the domain of losses, whereas they are typically risk averse in the domain of gains (risk aversion is also in line with diminishing sensitivity in standard expected utility theory). A classic illustration of this pattern stems from Tversky and Kahneman (1981; p. 453) and deals with the outbreak of a new disease. Specifically, the disease in their example is expected to kill 600 people. In their study, Tversky and Kahneman had experimental participants deciding between two different programs for tackling the disease. Participants in the gain frame condition had the choice between Program (a) that would save 200 people and Program (b) that had a 1/3 probability of saving 600 people and a 2/3 probability of saving no-one. In this gain frame condition, a majority of the respondents (72%) preferred Program (a). In contrast, in the loss frame condition, the consequences of Program (a) were described as 400 people having to die, and Program (b) as having a 1/3 probability of nobody dying and a 2/3 probability of 600 people dying. Importantly, note that the outcomes are actually exactly the same both in the gain and the loss frame (200 out of 600 people saved means that 400 people die, etc.). They are just presented differently. Nevertheless, in the loss frame condition the majority of participants (78%) now preferred Program (b). The typical interpretation of this finding is that in the gain frame, saving people becomes the reference point and being able to save a certain number of people for sure through Program (a) seems like a good thing to most people and therefore not worth taking any risk by choosing Program (b). In the loss frame, in contrast, the possibility of

people dying because of the disease becomes the reference point and having a certain number of people die for sure as in Program (a) seems like a bad thing. To try to avoid that loss, many people are now willing to take some risk and are thus more inclined to choose Program (b).

Behaviorally informed policy interventions can leverage on loss aversion by framing decisions as being in the loss or in the gain domain, depending on what kind of behavior one wants to encourage. For example, when trying to increase people’s motivation to engage in pro-environmental behavior, loss-framed pro-environmental incentives have proved to be more effective than providing the same incentives but framing them in the gain domain (Ghesla et al., 2020). Similarly, Avineri and Waygood (2013) find significant effects of loss frames in a study focusing on information framing along the lines of Tversky and Kahneman (1981) as described in the preceding paragraph. In other cases, depending on the kind of behavior that one wants to promote, gain framing may be more helpful, as it increases people’s risk aversion. For instance, Rothman and Salovey (1997) demonstrated that gain-framed messages could be used to encourage risk-averse choices in the context of decisions regarding health behaviors. There are also examples where nudging interventions trying to appeal to people’s loss aversion were unsuccessful, however. Again regarding health behaviors, for instance, in a meta-analysis O’Keefe and Jensen (2007) did not find a significant difference in effects of loss compared to gain-framed messages trying to encourage various disease prevention behaviors. Also in the environmental domain, there are unsuccessful examples. Momsen and Stoerk (2014), for example, report the results of a survey experiment investigating the choice of energy contracts and did not find any significant effects of loss frames.

In sum, loss aversion is a very well-researched element of human cognition and decision making and has the potential to provide interesting leverage points for nudging approaches and other behavioral economics policy interventions. However, the results on the effectiveness of such approaches is mixed with some papers reporting significant effects of loss frames, and others reporting no effects. This indicates that there is still more research needed to understand in which specific applications nudges based on loss aversion and reference dependence can be successful.

3 Environmental Decision Making in SMEs

The literature discussed until here has examined decision making processes of individuals and how nudging approaches can be used to improve individual decision making or to steer people’s choices into a desirable direction. Successful nudges typically build on some behavioral elements of human decision making and motivation, such as, for example, social preferences, present bias, or loss aversion, as discussed above. When asking whether nudging approaches can be extended to companies, in particular to SMEs, the first related question that emerges is to what extent, and how, decision making in companies differs from the decision making of individuals.

A priori, there seem to be many differences between company decision making and decision making by individuals in the roles of consumers or citizens. In companies, for example, decisions are often made jointly by many employees, there is some kind of hierarchy, people often decide according

to what is expected from their function in the firm rather than their personal convictions, and so on. Typically, the literature in behavioral economics therefore assumes (at least implicitly) that firms' decisions are more rational and less prone to behavioral biases than individuals'. Indeed, most of the existing evidence indicates that groups are better than individuals at making self-interested decisions, and are, in this sense, more rational (Charness and Sutter, 2012). Yet, anybody who has ever spent some time in a business or other organization knows very well that organizational decision making does often not correspond to the idealized prescriptions of rationality and efficiency. Instead in larger organizations, additional biases and problems emerge because of the interactions between different coalitions of groups (see, e.g., Cyert and March, 1963) or because of group dynamics (see, e.g., Janis, 1982).

However, because of their smaller size, SMEs may be more strongly influenced by specific individuals and thus also more prone to biases present in individual-level decision making than larger companies. Indeed, in SMEs sometimes the owner-entrepreneur directly makes relevant decisions and in other cases smaller groups of individuals make decisions. Especially SMEs may thus have decision processes that are similar to those of individuals, at least in some cases (e.g., Schmitz and Schrader, 2015). Correspondingly, there is indeed some evidence that small companies are subject to similar decision making biases as individuals (see, e.g., Kremer et al., 2013, and further evidence cited below). Moreover, some research actually shows that owner-entrepreneurs in SMEs are more likely to use decision making heuristics and are more susceptible to individual decision making biases than managers in larger organizations (Busenitz and Barney, 1997).

The remainder of this section first considers the broader influence factors and the state of environmental management in SMEs and discusses why and how nudging approaches could be successful to improve environmental management in SMEs. Afterwards, the discussion returns to the three elements of behavioral decision making described above in Section 2 and outlines how social preferences, present bias, and loss aversion can affect environmental decision making in SMEs.

3.1 Environmental Management in SMEs and the Potential for Nudging

Although larger companies may also not behave optimally concerning environmental issues, SMEs seem to be doing worse than their larger counterparts (Gallo and Christensen, 2011; Brammer and Millington, 2006). This means that there is a large improvement potential overall since SMEs make up the largest share of firms and employ the majority of workers in most economies around the globe.

The literature discusses several reasons for the limited engagement of SMEs with questions of environmental or sustainability management. For instance, SMEs may often be too absorbed by their daily core business to find time and resources to invest into improving environmental management practices (Studer et al., 2008). In addition, SMEs' resources tend to be smaller than their larger counterparts' (Biondi et al., 2000). These factors may also explain the discrepancy between their generally positive environmental attitudes and their limited awareness of business issues related to and best practices in environmental management (Tilley, 1999; Taylor et al., 2003).

It seems that in many SMEs the knowledge of how to implement good environmental management is lacking. Indeed, Hörisch et al. (2015) find that controlling for the level of knowledge about relevant management practices, there is no difference anymore between smaller and larger companies in the extent of sustainable management practices that are implemented.

As limited resources and a lack of knowledge seem to be an important part of the explanation why SMEs are less successful in implementing environmental management practices compared to larger companies, external interventions trying to provide SMEs with resources and the necessary knowledge on how to improve sustainability and environmental management might be warranted and fruitful. Moreover, SMEs might be responsive to nudges, if they successfully attract attention to a previously neglected topic and highlight its importance. Evidence supporting this notion stems from the literature studying tax evasion. Nudges such as, e.g., reminders about the social norm to pay taxes and information about true audit probabilities, are indeed successful in increasing tax compliance of SMEs (Doerrenberg and Schmitz, 2017). Thus, nudging SMEs may induce decision makers to take more socially desirable actions also in the environmental domain.

Moreover, like for individuals, as argued for instance for the case of retirement savings (e.g., Thaler and Benartzi, 2004), nudges might actually help SMEs make decisions that are in their own interest and maximize a firm's long-term performance. Specifically, nudging may be beneficial for SMEs if it encourages decision makers in SMEs to apply management practices that increase firm performance but that they were unaware of or simply did not apply previously. Good management practices are slow to spread, especially among SMEs, even when they are beneficial for firms (see, e.g., Bloom and Van Reenen, 2010). Relatedly, results from field experiments provide causal evidence that helping randomly selected firms implement a set of established management practices improves their performance compared to an untreated control group (see, e.g., Bloom et al., 2013). If such experimental interventions can improve firm performance, an important question is how firms, and in particular SMEs, can be encouraged to implement beneficial practices. A nudging approach could provide a cost-effective potential solution to this problem that could allow targeting SMEs and spreading best practices at a larger scale.

The following three subsections discuss potential leverage points for behaviorally informed policy interventions targeted at SMEs linked to the three behavioral facets of human decision making and motivation discussed earlier: social preferences, present bias, and loss aversion.

3.2 Social Preferences and SME Environmental Decision Making

As argued above, the preferences and world views of individual decision makers in the roles of owner-entrepreneurs or similar positions can have a very direct influence on decisions made by SMEs. In fact, also for larger companies, the literature on Corporate Social Responsibility (CSR) discusses how organizational CSR engagement is shaped by the individual dispositions, values, and world views of the individual managers of an organization (Hemingway and Maclagan, 2004; Crilly et al., 2008). This link is likely more direct and thus stronger in SMEs, where often owner-managers can determine company decisions more or less directly. Thus, social preferences and

pro-environmental motivations of owners or relevant managers in SMEs might be quite directly relevant for the environmental decision making in SMEs.

It could be, however, that the business context in which most SMEs operate weakens the relevance of individual decision makers' social preferences. Indeed, there is some literature in behavioral economics pointing to the possibility that competitive markets crowd out non-selfish considerations, such as moral questions, concerns about fairness or social preferences (see, for instance, Falk and Szech, 2013 or Fischbacher et al., 2009 but also Bartling et al., 2015 and Bartling et al., 2017).

In line with this latter perspective, research on Corporate Social Responsibility (CSR) in the management literature often asserts that firms only engage in CSR practices because executives believe that it can increase profitability (see, e.g., Bansal and Roth, 2000 or Brønn and Vidaver-Cohen, 2009, but also Hafenbrädl and Waeger, 2017, for a more nuanced perspective). Also for SMEs it is often assumed that pressures from the outside (e.g., by stakeholders such as customers or because of legal requirements) are the most important determinant of engaging in CSR activities such as environmental management (Morsing and Perrini, 2009) and the importance of making a convincing business case to promote CSR to SMEs is often emphasized (e.g., Jenkins, 2009). Williamson et al. (2006) conclude that the market logic present in SMEs prevents them from taking any action that could hurt business performance, from which they follow that advances in environmental management or CSR in SMEs cannot be driven by voluntary actions of SMEs, but need to be advanced through regulation. Similarly, in a study asking government representatives, members of non-governmental organizations, academics, and business practitioners about possible pathways to improve the environmental management of SMEs in Hong Kong, Studer et al. (2008) find that fiscal incentives and pressure exerted from within the supply chain (e.g., by large corporate customers) are perceived as the most effective policy tools to get SMEs to improve their environmental management practices.

Policy makers, researchers and business practitioners thus often assume that SMEs concentrate on the financial bottom-line and that they will therefore only be willing to take Corporate Social Responsibility (CSR) or environmental management measures if they can be convinced that such measures will increase profitability. Trying to foster CSR or environmental management practices in SMEs by emphasizing that such activities are economically viable may be of limited effectiveness, however, because the business case for taking such measures is often weak for SMEs (Lawrence et al., 2006; Lynch-Wood et al., 2009). In fact, small enterprises tend to perceive environmental measures as a cost and not as a business opportunity (UK Environment Agency, 2003). It seems that SMEs thus have less to gain from CSR activities than larger companies. A reason may be that SMEs are typically not exposed to the same amount of scrutiny and external pressures as larger companies, as they tend to be less visible and have smaller customer bases (Lynch-Wood et al., 2009).

It may therefore be the case that in SMEs the likelihood to engage in CSR activities, such as introducing effective environmental management practices, is less strongly driven by economic

motivations and more directly linked to individual decision makers' personal values and motivation (see also Hammann et al., 2009). Some qualitative studies such as Spence and Rutherford (2001) and Dincer and Dincer (2013) show that decision makers in SMEs often act based on their personal values, rather than based only on business considerations, and that many of them do have a pronounced concern for social and environmental issues. This may be relevant to consider when attempting to increase CSR, sustainability, or environmental management practices in SMEs. Or, as Spence and Rutherford conclude: "If policy makers wish to influence the ethics of small firms, they need to ... move beyond the notion of the profit-maximising, rational economic entrepreneur as the standard image of the small business owner-manager" (p. 126).

There are to date very few quantitative studies testing whether appealing to social preferences, moral, or environmental concerns can be an effective tool to trigger improvements in SMEs' environmental management practices. In an online survey experiment, Kuhfuss et al. (2016) find that a descriptive social norm nudge increases farmers' stated willingness to engage in pro-environmental practices. In a field experiment using the set-up of a governmentally sponsored environmental consulting program for SMEs in Switzerland, Grieder et al. (2020b) find that when promoting the program to SMEs, appealing to the environmental benefits of environmental management practices was just as effective as underlining the financial benefits for the participating SMEs.

In sum, social preferences are an important element in decision making in SMEs. Appealing to social preferences might be potentially successful to promote the spread of best practices in environmental management and sustainability to SMEs. Appealing to social preferences and environmental concerns seems particularly attractive, because often the financial profitability of taking additional environmental management measures cannot be taken for granted for SMEs.

3.3 Present Bias and SME Environmental Decision Making

Present bias of relevant decision makers tends to work against SMEs implementing environmental management measures, because such measures are typically associated with an immediate upfront cost, whereas the returns are uncertain and lie far in the future. Even though the immediate cost may not be very large, and may sometimes even only consist of devoting time and attention to the topic, present bias disproportionately increases the weight that a decision maker puts on such immediate costs. Indeed, in a survey study linking a measure of managers' present bias to their companies' decisions to make long-term investments (into worker training), Jansen et al. (2017) find that managers' tendency to procrastinate (a proxy for present bias) was negatively associated with investments.

An often-heard explanation why environmental management practices are not more prevalent in SMEs is a lack of interest and time to tackle environmental questions. Even though, this could sometimes simply be a rational decision to allocate the scarce resource time to other activities that yield a higher marginal benefit, it may also be partly linked to inertia and an unwillingness to incur initial costs when implementing new environmental management practices, which could be partly explained by present bias. A typical example are again energy efficiency measures. Such measures

necessitate a certain upfront investment, certainly in terms of time and attention, and usually also in monetary terms. Even though many energy efficiency measures are profitable from a financial perspective in the long run, empirical research studying why SMEs do or do not invest in energy efficiency measures often finds that inertia or a lack of interest are important barriers, alongside economic (e.g., lack of capital) and information factors (e.g., Trianni et al., 2013).

Interestingly, Andersen et al. (2014) find that small business entrepreneurs seem to be more patient (i.e., have higher discount rates) than the general population and are therefore more willing to make long-term investments into the future. However, in a recent Master Thesis, Panozzo (2019) finds that Italian entrepreneurs are more impatient (i.e., have lower discount rates) when making intertemporal choices in the company sphere than when making the same decisions in the private sphere.

In any case, considering present bias can be very relevant for the success of policy measures trying to foster environmental actions in SMEs. For instance, in a recently completed field experiment with SMEs, Grieder et al. (2020a) show that the presence of only very small transaction costs can have a disproportionately negative impact on the implementation rate of simple and financially costless measures to reduce an SME’s environmental footprint. When designing environmental policy programs targeted at SMEs, it thus seems crucial to make things as simple as possible for SMEs and to reduce (also non-monetary) transaction costs to the absolute minimum. Similarly, Clot and Stanton (2014) point out that the timing of payouts is relevant for motivating farmers to participate in environmental programs. They refer to Costa Rica’s very successful reforestation program (“Pago de Servicios Ambientales”) that is attractive to (potentially present-biased) farmers because it offers a substantial upfront payment for participation in the first year combined with lower payments in later years. This program seems much more successful than a similar program in China (the Guangxi Watershed reforestation program) that simply offers uniform annual payments for participation (see also Gong et al., 2010). Moreover, Clot and Stanton (2014) also show that time preferences they elicited from farmers in Uganda predict participation in a similar program.

In sum, present bias is a relevant force in environmental decision making in SMEs. Policy makers who want to ensure the success of environmental policies trying to foster environmental actions by SMEs can increase the success of such policies by taking present bias into account when designing their policies. Specifically, it seems important to lower transaction costs and other initial costs for SMEs for taking environmental actions wherever possible. In addition, incentives can also be structured in a clever way, making them more attractive to potentially present-biased decision makers in SMEs.

3.4 Loss Aversion and SME Environmental Decision Making

The existing empirical evidence suggests that decision making in SMEs may be less prone to loss aversion than decision making by individuals. For instance, Sutter (2007) finds that even though teams who make joint decisions are also loss averse, they are less so than individuals making decisions by themselves. However, Whyte (1989) argues conceptually that under certain conditions,

as a consequence of loss aversion, group decision making can lead to more risk seeking in the domain of losses than individual decisions.

Comparing, the degree of loss aversion between entrepreneurs, managers, and employees, Koudstaal et al. (2016) find that entrepreneurs display less loss aversion than both managers and employees (see Georgalos, 2018, for an overview of the literature on this topic). Thus to the extent that SMEs are led by entrepreneurs, this could be taken to mean that loss aversion is a less relevant behavioral force in SME decision making than it is in decision making by other economic actors. However, in line with the evidence by Sutter (2007) cited above, Nyaribo (2010), Kremer et al. (2013), and Lamptey and Marsidi (2020) all find some degree of loss averse behavior when investigating financing and inventory accumulation decisions of SMEs in Kenya and Ghana.

Just as for individuals, loss aversion could be used to motivate SMEs to take environmental actions. However, when trying to motivate SMEs to participate in free consulting to analyze and improve their environmental management practices, Grieder et al. (2020b) did not find that framing the benefits (either in terms of economic benefits to the SME or in terms of benefits to the environment) in the loss compared to the gain domain had a significant impact. Future research should test different approaches. For instance, appealing to a potential loss because of falling back behind competitors who implement more advanced environmental management practices could prove to be more effective.

In sum, even though loss aversion is a relevant phenomenon for decision making in SMEs, it seems to be less strong for SMEs than for other economic actors. There are still relatively few studies, however, investigating this topic. It therefore would be interesting for future research to test the effectiveness of nudges and other policy interventions that explicitly consider loss aversion tendencies in SMEs.

4 Conclusion

This chapter has outlined how behavioral facets of human decision making and motivation can affect environmental decision making in SMEs. The focus was on three topics that are well documented and have been extensively researched in the behavioral economics and psychology literature on individual decision making: social preferences, present bias, and loss aversion. It was argued that all three of these behavioral phenomena can potentially play a role for environmental decision making in SMEs and that they offer leverage points for designing policy interventions that try to increase the prevalence of good environmental management practices in SMEs.

This opens a new perspective on how public policy can attempt to improve the environmental impact of the large SME segment of the economy. To date, policy measures targeted at SMEs have rarely made use of insights from behavioral economics. Currently, the political and economic discourse on what measures should be taken to improve the environmental footprint of SMEs often seems to be caught in a perceived dichotomy between a focus on purely voluntary efforts on the one hand, and a focus on hard government action in the form of command and control regulation or the

implementation of financial incentives via taxes or subsidies on the other hand. The former approach is typically championed by pro-market and pro-business advocates who argue that governments should keep the regulative burden on firms, especially on SMEs, low, and that the market will more efficiently take care of the problem in the long run. This view is criticized by proponents of the latter approach who argue that especially for SMEs, the business case for taking actions to reduce their environmental footprint is often not given and that voluntary efforts will therefore not lead to the desired changes, meaning that legislative action is necessary. Considering insights from behavioral economics, as outlined in this chapter, opens a new perspective: even though the business case for SMEs taking environmental (or other CSR related) actions, is indeed often questionable, many relevant decision makers in SMEs are still motivated to take such actions because of their personal world-views, values, and preferences. Behavioral economics policy instruments such as nudges can be used to try to activate these personal preferences and to trigger decision makers in SMEs to take relevant environmental actions. Moreover, behavioral biases such as present bias or loss aversion, may lead SMEs not to take certain actions that are actually in their financial interest. Again, cleverly designed policy interventions can help to overcome such biases and make sure that implemented policy instruments are more effective.

It is important to acknowledge, however, that policy tools from the behavioral economics toolkit cannot fully substitute hard policy tools (such as, e.g., taxes or command and control regulation). Indeed from an economist's point of view, the first-best solution would usually be to internalize negative external effects of economic activity on the environment via taxes or via market-based incentive schemes such as emissions trading. However, apart from the considerable technical difficulties in the implementation of such solutions, it is often very difficult and time consuming to reach sufficient political consensus that allows the introduction of such measures with the required stringency. Therefore, a dual strategy, which also considers behavioral measures, seems worth pursuing. Indeed, behavioral economics policy instruments, such as nudges, offer potential ways to foster personal and corporate responsibility. Instead of waiting for technical innovation to deliver the required solutions or for policy makers to become active and actually implement unpopular but important measures, behavioral approaches do offer a second-best solution, which might help reduce negative external effects of economic activities on the environment and thus help to slow down the process of climate change or address other environmental problems. Such behavioral interventions are often relatively fast and cheap to implement and, if effective, can at least make some contribution to solving environmental problems. The current chapter has hopefully offered some perspectives on how to extend such approaches to the important SME segment of the economy.

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