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Grand Societal Challenges and Responsible Innovation

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ABSTRACT Grand societal challenges (GSCs) represent complex, multi-level, multi-dimensional problems that require concerted efforts by various actors – public, private, and non-profit – to be successfully addressed. Businesses – alone or in conjunction with governmental and non-profit organizations – are relevant actors in this regard, as they represent a source of innovation. Responsible innovation (RI) is a framework that allows for the governance and evaluation of innovations with regard to their potential harmful consequences and positive contributions to societal challenges. Moreover, it stipulates that this evaluation process should be facilitated by appropriate governance structures at various levels. The aim of this article is to expand theorizing on GSCs and RI and to encourage research that explores their links. We outline pertinent characteristics of GSCs that make current conceptualizations of corporate social responsibility and social innovation limited in addressing GSCs. We explicate the reflexive and participative capacities of RI governance as a complementary and promising way forward. Finally, we introduce the contributions to this Special Issue as illustrations of relevant theoretical and empirical groundwork around GSCs and RI, and outline the agenda for future research.

Keywords: Grand societal challenges, responsible innovation, global and corporate governance, deliberation, sustainable development, COVID-19

INTRODUCTION

Policymakers, intergovernmental actors, business practitioners, and researchers across disciplines have begun to recognize the need to pool resources and to work together to address grand societal challenges (GSCs) (EU, 2021; George et al., 2016; Griggs et al., 2013; Nilsson, 2017; United Nations, 2015). GSCs are massive social and environmental

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issues that transcend national borders – such as climate change, inequality, disruptive migration, and global pandemics – and that have potential or actual negative effects on large numbers of people, communities, and the planet as a whole. They need to be addressed through collaborative efforts because the development and implementation of effective responses depends on contributions from a wide range of state and non-state actors (Ferraro et al., 2015; Griggs et al., 2013; Whiteman et al., 2013).

Recognizing this need and complexity of GSCs, the United Nations launched the Sustainable Development Goals (SDGs) in 2015 (United Nations, 2015). Most recently, the COVID-19 pandemic demonstrated the immediate impact of a GSC and the acute need to achieve SDGs related to health and well-being. It highlighted the dependence of solutions on a combination of private and public contributions and decisions (e.g., providing protective equipment and materials; developing, producing, and delivering COVID-19 vaccines at an extraordinary speed). The pandemic also underscored the interdependence among GSCs: for example, the trade-off between potentially positive impacts on climate due to the decline in air traffic and negative impacts on decent work and economic growth, poverty, hunger, and so forth (Muzio and Doh, 2020). We argue that the management literature lags behind practice in exploring solutions and interdependencies related to GSCs and could help practice by advancing a framework that incorporates the difficult trade-offs and assists decision-makers with solutions.

One of the most promising avenues for addressing GSCs is through responsible innovation (RI) (Khavul and Bruton, 2013; Owen et al., 2012; Stilgoe et al., 2013; Voegtlin and Scherer, 2017). RI is a framework that evaluates innovations for their potential harmful consequences, on one hand, and their potential positive contribution to societal challenges, on the other. It suggests that this evaluation process should be facilitated by appropriate governance structures at various levels. Again, COVID-19 is a case in point for the need for RI and, as we outline in this article, the need for coordination of efforts to direct such innovation and to safeguard its legitimacy, effectiveness, and efficiency.

There have been increasing attempts by policymakers to facilitate RI (Nilsson, 2017). For example, in recent years, the EU has funded cross-disciplinary projects under a new Responsible Research and Innovation (RRI) framework (EU, 2021; Novitzky et al., 2020). Partly driven by this EU priority, the Engineering and Physical Sciences Research Council (EPSRC) of the UK has embarked on an institutionalization process of RI, mainly through universities (Owen et al., 2021). In addition, the Chinese government has promoted the concept of a 'harmonious society' to encourage scientific, technological and socio-economic development in which 'economic growth is balanced against the urgent need to tackle pressing societal and environmental problems existing in China' (See, 2009, p. 1). In the US, the Office of the Controller of the Currency (OCC), a key US regulatory body, has established a department tasked with supporting RI in the financial technology sector (OCC, 2021).

While these initiatives are important steps, they have many shortcomings, including being primarily limited to national territories, focusing on risk management, and, in many cases, not integrating business as a main source of innovation. Acknowledging this oversight of the potential role of business, policymakers in many countries have begun experimenting with new legal forms that tie the business corporation to a purpose, such as the B-Corps statute in the US, or the 'entreprise à mission' in France (Cao et al., 2017;

Levillain and Segrestin, 2019), trying to align the firm's activities with the needs of various stakeholders outside the organization. As pointed out by Aguilera and colleagues (2007), business firms are 'important and necessary social change agents' (p. 857). The private sector is increasingly seen to have a critical role in developing solutions to the GSCs, as evidenced by the growing number of partnerships between the business community, civil society organizations, and governmental as well as intergovernmental agencies; the emergence of dedicated CSR departments in many companies; and corporate engagement in initiatives like the UN Global Compact or the World Business Council for Sustainable Development.

Nonetheless, management research on RI to date has been fragmented across various business and management sub-disciplines such as CSR, corporate sustainability, social entrepreneurship, social innovation, or innovation literatures, and has not yet developed to a sufficient degree the bridge between RI and GSCs (Lubberink et al., 2017; Voegtlin and Scherer, 2017). Moreover, as GSCs and RI represent complex issues that touch on a variety of scholarly fields of inquiry and span multiple levels of analysis, there is a need for more interdisciplinary or boundary-spanning research. Therefore, the goal of this article is to integrate existing discussions of RI with the literature on the management of innovation in business organizations by providing, first, a systematic accounting of the link between GSCs and RI in and throughout business; second, an analysis of the relevance of RI to some of the prevailing assumptions of and approaches to CSR and social innovation; and third, an outline of how RI can be facilitated with the help of business.

With this article, we aim to provide the groundwork for systematic research on RI. We would like to encourage more work on RI that includes business as part of the solution and that focuses on global sustainable development. We believe the topic is destined for cross-disciplinary research and for thinking beyond established boundaries. As our Special Issue contributions show, complex problems require complex solutions. By highlighting them as exemplary research to study GSCs and RI, we provide an overview of RI, its key dimensions, relationships to adjacent constructs, and links to GSCs. In turn, by outlining theoretical avenues for approaching RI, we propose an agenda for future boundary-spanning research.

RESPONSIBLE INNOVATION: DEFINING THE CONSTRUCT AND ITS LINKS TO GRAND SOCIETAL CHALLENGES

Existing approaches to RI apply a broad perspective to innovation and take account of the variety of actors inside and outside the scientific system that might be involved in innovation processes (Blok, 2019; Khavul and Bruton, 2013; Stilgoe et al., 2013), mainly to target national governments and evaluate policy implications (see e.g., Owen et al., 2021; von Schomberg and Hankins, 2019). In this context, RI has been defined as 'a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products' (von Schomberg, 2011, p. 50). Recently, management scholars have begun to introduce RI to

the management literature (e.g., Lubberink et al., 2017; Owen et al., 2013) by discussing three pertinent types of responsibility relevant for exploring the role of private business (see Scherer and Voegtlin, 2020; Voegtlin and Scherer, 2017): (1) the responsibility to do no harm (Lee and Petts, 2013; Stahl et al., 2022), (2) the responsibility to do good (Stahl and Sully de Luque, 2014), and (3) responsible governance (Scherer and Palazzo, 2011), which involves establishing institutions, structures, and procedures on multiple levels in order to facilitate innovations that incorporate (1) and (2).

Our aim is to build on and extend this discussion by considering RI as a relevant and necessary lens for understanding, studying, and facilitating the contribution of business innovation to GSCs. In order to develop the rationale for our argument, we first highlight the unique characteristics of GSCs. We then discuss where current concepts and heuristics of CSR and social innovation in our view do not go far enough in addressing these unique characteristics. Finally, we explicate aspects of RI governance that promise more direct and coherent responses to the intricacies of GSCs and sustainable development. Table I summarizes these steps.

We note that sustainability and CSR are closely related but somewhat distinct constructs (see Bansal and Song, 2017, for a discussion of the distinction), and some scholars use the two constructs interchangeably (e.g., Doh et al., 2019). In the following, we use the term 'sustainable development' or 'sustainability' as an umbrella term to refer to the system-level goal of preserving society and protecting the environment for the benefit of future generations (Bansal and Song, 2017), and we use the term 'CSR' to refer to business practices designed to achieve this goal. However, we acknowledge that, in line with the observation by Bansal and Song (2017), some of our critical assessments of the CSR discourse and CSR practices also apply to research on and practices of sustainability because 'both fields of responsibility and sustainability take a strategic orientation toward the business case for "good" social and environmental practices' (p. 107). We also note that in the context of RI, sustainable development is considered a goal to be addressed by RI (see also Scherer and Voegtlin, 2020), while both discussions on CSR and sustainability have the business–society relationship at their core, which is also a central focus of our argument.

The Characteristics of Grand Societal Challenges

The three defining characteristics of GSCs are their complexity, uncertainty, and value-laden character (Ferraro et al., 2015). GSCs are highly *complex* in that the number of elements and interrelationships that constitute the challenges or that would lead to their resolution exceed any comprehensive analysis and cannot be fully understood, and are thus difficult to address (Schneider et al., 2017; Schreyögg and Steinmann, 1987). Typically, GSCs affect and are affected by multiple actors and domains, multiple locations and multiple time frames; for instance, they are often interrelated and transcend national borders and jurisdictions (Nilsson and Persson, 2012). Moreover, they are non-linear and dynamic, and they include feedback loops and rebound effects. All this makes it more difficult to identify their root causes and leads many innovators to think that it may be easier to develop solutions that mitigate the effects rather than the causes of GSCs.

GSCs are also characterized by high or radical *uncertainty*, making problematic the prediction of their development and of the involved actors' perceptions (Grimes and Vogus,

Table I. The responses of business responsibility concepts to GSCs

GSCs are characterized by their:	*The response of (strategic) CSR relies on:*	*The response of social innovation relies on:*	*RI (governance) relies on reflexivity and deliberative capacity to:*
Complexity, comprising elements and relationships that cannot be fully described or understood, comprising multiple domains and actors, multiple locations, multiple time frames and being dynamic and nonlinear	Reducing complexity and uncertainty by initiating a sustainability strategy, including a clear vision of a desirable future state and subsequent strategic planning	Reducing complexity and uncertainty by focusing on the intended social innovation outcome and its impact measurement	Manage governance tensions between *decentralization* and *centralization* (in the institutional architecture) and between *flexibility* and *stability* (relating to the institutional dynamic)
	This results in linear solutions with limited possibilities to incorporate feedback and changes, and therefore, in limited responses to GSCs	This results in limited reflection on potential negative uses and side-effects of the innovation for GSCs	This allows for engaging with the dynamic and nonlinear character of GSCs by creating structures and resources that allow for feedback and adaptation, and inputs from a variety of actors and domains
Uncertainty, future states and preferences being difficult to predict, spanning many future states and relying on unstable preferences of the actors involved	Reducing complexity and uncertainty by initiating a sustainability strategy, including a clear vision of a desirable future state and subsequent strategic planning	Reducing complexity and uncertainty by focusing on the intended social innovation outcome and its impact measurement	Manage governance tensions between *public participation* and *expertise* (as sources of knowledge)
	This results in linear solutions with limited possibilities to incorporate feedback and changes, and therefore, in limited responses to GSCs	This results in limited reflection on potential negative uses and side-effects of the innovation for GSCs	This allows for engaging with the uncertainty of GSCs by increasing foresight through the inclusion of expert knowledge from various sources, including the lay public, and can help to uncover blind spots and unforeseen implications

(Continues)

Table I. (Continued)

GSCs are characterized by their:	*The response of (strategic) CSR relies on:*	*The response of social innovation relies on:*	*RI (governance) relies on reflexivity and deliberative capacity to:*
Value-laden character, being laden with moral or social values and approached or understood in multiple ways, through variable ontologies, interests, and world views.	Ordering the relevance of the varying ideas and value-laden demands of stakeholders according to stakeholder attributes and through tools like stakeholder materiality	Founder or firm-centric driven innovation decisions without a real involvement of beneficiaries. Focus on managing hybrid tensions of stakeholders valuing social mission and stakeholders valuing economic objectives	Manage governance tensions between *diversity* and *consensus* (related to the composition of discourse participants)
	This does not address the socially constructed and value-laden character of GSCs and does not allow for the exchange of knowledge and arguments and the development of a common understanding or consensus	This does not address the socially constructed and value-laden character of GSCs and does not allow for the exchange of knowledge and arguments and the development of a common understanding or consensus	This allows for engaging with the different viewpoints and expectations related to GSCs through 'values work' and the search for meta-consensus, and, ultimately, for securing the legitimacy and societal support for a chosen path

Note: The characteristics of GSCs are adapted, in part, from Ferraro et al. (2015).

2021). Radical uncertainty – or Knightian uncertainty (Knight, 1921) – means that the potential future states of GSCs are not known and that probabilities cannot be assigned to potential states. This limits the forecasting of how innovations will affect GSCs and what unintended side effects they might have for interrelated challenges. Adding to this effect of radical uncertainty is the instability of preferences of actors having a stake in the development of solutions to GSCs. This means that not only the future states of GSCs but also the future preferences of stakeholders cannot be predicted with any certainty.

Finally, GSCs are *value-laden*: they can be 'approached and understood in multiple ways' (Ferraro et al., 2015, p. 366) depending on the value system, worldview, or socialization of the involved actors who interpret GSCs and their significance (Gümüsay et al., 2020). Seen from a social constructivist perspective, GSCs require not only ontological (i.e., what is given by nature or made by humans) and epistemological (i.e., what is true or false) judgements but also value-based judgements (about what is good or bad). Individuals and social groups use such judgements to evaluate and construct their view on the nature, implications, and relevance of GSCs. Another term used to describe this analytical facet of GSCs is 'evaluative', referring to GSCs as 'problems [that] cut across jurisdictional boundaries, implicate multiple criteria of worth, and can reveal new concerns even as they are being tackled' (Ferraro et al., 2015, p. 365).

GSCs typically present social, political and economic problems at the same time, and the solutions to these problems should therefore comprise all these domains. In addition, GSCs affect multiple stakeholders, with different, and sometimes conflicting, needs and interests. Different actors with different values form different views about what a specific challenge like poverty is, how it can be studied and solved, its true scope and impact, and the legitimacy of devoting resources to solving it, bringing different ontological, epistemological, and moral, values-based assumptions to the table (Hudon and Sandberg, 2013; Morduch, 2000). Further, the potential trade-offs between GSCs make it difficult to develop solutions that satisfy all involved parties' views and expectations (Marti and Scherer, 2016). This socially constructed character complicates the choice of the right goals for business innovation and the assessment of potential measures to address GSCs.

CSR AND SOCIAL INNOVATION AS RESPONSES TO GRAND SOCIETAL CHALLENGES

In the following, in light of the above-mentioned problematic characteristics of GSCs, we outline the reasons why we consider RI a necessary complement to the CSR literature, with its focus on avoiding harm, alongside the social innovation literature, with its focus on doing good. Importantly, we acknowledge that both literature streams are broad and fragmented, and therefore, we cannot discuss all their nuances, yet we will focus on GSCs and their problematic characteristics in this discussion to help identify how these literatures propose to tackle GSCs.

CSR Responses to Grand Societal Challenges

First, we turn to research on and practice of *CSR*, which has a tendency to address the intricacies of GSCs via a strategic approach (Freeman, 1984; McWilliams and Siegel,

2006; Rasche et al., 2017). In practice this approach is reflected in major CSR guidelines, such as the ISO26000 (www.iso.org/iso-26000-social-responsibility.html), or the Global Reporting Initiative (GRI; www.globalreporting.org), that focus on the implications of CSR for the competitive advantage of the firm. In theory with its roots in economics (Hart, 1995; Jones, 1995), the underlying assumptions of CSR are often derived from economic models of rational actors that operate in competitive environments, for example, under oligopoly or perfect competition industry structure (Hawn and Kang, 2018). The strategic rationale for CSR is therefore an extension of strategic considerations related to competitive positions in the market (Jensen, 2002; McWilliams and Siegel, 2001; Siegel, 2009; Vogel, 2005). CSR is considered to be most effective for sustainable development if it is coherent, sensitive to the context (institutional, cultural, etc.; Filatotchev et al., 2021), implemented throughout the organization and driven by a clear strategic vision (Serafeim, 2020) that often leads to linear and comprehensive planning, explicit codes of conduct, and action programs that are implemented by top-down management and control systems (see, e.g., Tang et al., 2012).

This has clear advantages for business firms, as formulating a strategic plan helps reduce the complexity and uncertainty associated with GSCs while limiting options and funnelling action toward a predefined goal. However, it also produces predominantly linear solutions without the flexibility to react to new developments or unintended side effects unforeseen because of the uncertainty of GSCs (Freiberg et al., 2020). Strategic plans are difficult to pursue in volatile, turbulent, and fast-changing environments, such as those we have witnessed over the past two decades. Moreover, they do not permit altering predefined goals and courses of action in response to changing preferences and priorities of the focal actors (Schreyögg and Steinmann, 1987; Simons, 1995), because that requires more 'robust action' and flexibility in goals, plans, and behaviours (Ferraro et al., 2015). To ensure that the predefined strategic goals are achievable, resulting innovations are often not very disruptive and are directed more at curing the symptoms instead of changing the root causes of GSCs, leading to incremental, not transformative changes (Hopwood et al., 2005; Maak et al., 2016).

Furthermore, strategic CSR relies on ranking the relevance of value-based demands of stakeholders (Wickert and Risi, 2019) focusing on eliminating the negative effects on company performance instead of developing positive effects of business on society (Fu et al., 2020). For example, stakeholders are mapped by stakeholder interest (y-axis) and stakeholder power (x-axis) in the stakeholder analysis (Murray-Webster and Simon, 2006), and stakeholder issues are ranked based on their potential to affect the financial condition or operating performance in the materiality assessment (e.g., Sustainability Accounting Standards Board; SASB, 2021; see also, GRI, 2021). However, while acknowledging stakeholder demands, such stakeholder engagement does not produce the necessary deliberation about the value-laden assumptions of stakeholders with regard to GSCs. We understand deliberation as 'debate and discussion aimed at producing reasonable, well-informed opinions in which participants are willing to revise preferences in light of discussion, new information, and claims made by fellow participants' (Chambers, 2003, p. 309). Instead, exchanges with stakeholders are viewed as a 'box-ticking' exercise for CSR reporting (Reynolds and Yuthas, 2008; Voegtlin, 2016). As a result, the corporate decision about the course of action often remains the outcome of the managers' perceptions

of relevant stakeholder attributes and demands, and less the result of experimentation (Ferraro et al., 2015) and open dialogue with stakeholders (Scherer and Voegtlin, 2020). Typically, there is little reflection on epistemic claims about the nature and effect of GSCs and no ethical discourse on effective and legitimate responses to these challenges. In fact, because managerial attention is more likely to be directed to negative issues, the presence of a chief sustainability officer reportedly decreases corporate social irresponsible activities more than it increases corporate social responsibility (Fu et al., 2020).

In essence, while we acknowledge the general advantages of such a strategic approach, we think it is not sufficiently oriented toward GSCs, and that it needs a complementary approach that allows for more direct responses to the complex, uncertain, and value-laden features of GSCs.

Social Innovation Responses to Grand Societal Challenges

Next, we turn to research and practice around *social innovation*, aiming to develop solutions to sustainability challenges (Dacin et al., 2010; Phillips et al., 2015) while serving some group of beneficiaries. This research has also expanded in many directions and produced a variety of approaches (Choi and Majumdar, 2014; van Wijk et al., 2019). However, although social innovation is pursued by organizations or individuals with prosocial motivations, the governance structures of many social enterprises tend to exclude the beneficiaries or wider groups of stakeholders from participation in its governance (Scherer and Voegtlin, 2020).

That is, even though by design social enterprises face the hybrid tension between stakeholders who value the social mission and those who value the economic objectives, decisions about how to innovate, and to what end, are often made at the firm level by the top management team or the founders of social ventures and, eventually, their investors, which are mostly venture capitalists, or donors like philanthropic foundations. As a case in point, research around social innovation rarely questions the innovation process or the resulting innovation outcomes, thereby neglecting the implications of unintended uses and side effects (e.g., Avelino et al., 2019). Instead, the primary focus is on trying to predict its positive impact by refining social impact measures (Ebrahim and Rangan, 2014; Perrini et al., 2020) in order to be able to communicate positive results to investors and donors. While this often leads to a high degree of accountability toward those main stakeholders, the focus remains narrow, neglecting the breadth of stakeholder interests and concerns (Pless et al., 2012).

This narrow focus results in limitations similar to those the strategic CSR literature faces with regard to the problems posed by the complexity, uncertainty, and value-laden character of GSCs, as it restricts the incorporation of feedback from the environment, impedes learning, and insufficiently incorporates the diversity of ontological, epistemological and value-based viewpoints related to GSCs. Consider the example of microfinance that was heralded as a social innovation serving the bottom of the pyramid and helping alleviate poverty. While there is still inconclusive evidence with regard to its effect on poverty alleviation, which is based partly on different understandings of how to assess poverty, and thus, the value-laden character of the GSC, its win-win proposition has been critiqued for neglecting the complexities of its management. In addition, because

of exploitative lending techniques and charging enormous interest rates by some firms, microfinance has been accused of producing unintended negative effects for the poorest (Hudon and Sandberg, 2013; Morduch, 2000). This example illustrates that as a result of the predominant focus on social innovation outcomes, responsible governance and innovation process management tend to be side-lined, although they are equally important for social innovation and entrepreneurship.

CSR and Social Innovation: The Reflexivity Deficit

Overall, CSR and social innovation governance have a 'reflexivity deficit' that makes it more difficult to address epistemic and moral questions that result from the complexity, uncertainty, and value-laden character of GSCs. In this context, reflexivity deficit means that corporate decision-making, because of the underlying implicit and explicit governance schemes in which it is embedded, does not sufficiently consider the implications and consequences of CSR as well as social innovation decisions for the beneficiaries and how they may perceive them. Moreover, the governance schemes do not sufficiently facilitate, and in fact often impede, the communication and effect of these concerns on corporate decisions and behaviours (Dryzek and Pickering, 2017).

Consider the example of TOMS' shoes (https://www.toms.com/), a company with a strong social responsibility commitment. It became known for its 'One for One' campaign, promising to donate one pair of shoes for those in need for each pair of shoes bought by its customers. However, by sending shoes to Africa, the company was accused of destroying the locally existing industry of shoemaking and creating new problems in the communities with which it interacts, showing a failure to account for the implications of its decision for beneficiaries (Wilson and Hopewell, 2018). There are other unintended consequences of social enterprises like TOMS, such as hostility from the government and intensified competition among other social enterprises for limited resources, harming beneficiaries and other stakeholders (Islam, 2020).

This also holds true for approaches that aim to combine the aspects of avoiding harm and doing good. For example, the 'shared value' approach (Porter and Kramer, 2006), which has gained prominence in business practice and focuses on creating value for the firm and its stakeholders, remains predominantly a strategic approach and, consequently, suffers from some of the same limitations of rigid strategic planning in response to GSCs that strategic CSR does. Among other things, it has been critiqued for its firm-centric orientation (Crane et al., 2014) missing stakeholder outcomes as well as innovation potential. However, our main criticism of all these approaches is that they do not put innovation centre stage and therefore do not include a systematic analysis of the conditions under which innovations targeting GSCs can be facilitated.

HOW RESPONSIBLE INNOVATION GOVERNANCE CAN FACILITATE RESPONSES TO GRAND SOCIETAL CHALLENGES

In contrast, the agenda and vision for RI advanced by international bodies like the EU calls for increasing the responsiveness of science to society through open innovation, open science, and openness to the world (Novitzky et al., 2020, p. 39; for the case of the

UN, see the Special Issue article by Ambos and Tatarinov, 2021). Therefore, we consider reflexivity as the necessary counterpoint to rigid strategic planning and top-down innovation governance, and as a way to facilitate RI. RI governance is thereby proposed as a relevant complement of and extension to existing efforts of CSR and social innovation that can help strengthen companies' ability to address the complexity, uncertainty, and value-laden character of GSCs.

Responsible Innovation, Reflexivity and Deliberation: Addressing Grand Societal Challenges' Complexity, Uncertainty, and Value-laden Character

Reflexive governance. Reflexivity relates to the ability of a system to reflect on its performance and to reconfigure itself in response to such reflection (Dryzek and Pickering, 2017; see also Buhmann, 2010, for examples of reflexive governance in the context of EU public-private regulation on CSR). As we explain below, reflexivity makes it possible for organizations and society to respond to the complexity, uncertainty, and value-laden character of GSCs and to engage in corrective measures, feedback, and even feedforward whenever errors in planning or implementation processes occur. Consequently, it bestows organizations with the capacity 'to function as deliberate, self-critical agents of change in social-ecological systems' (Dryzek and Pickering, 2017, p. 353).

Scholars have considered deliberation 'as necessarily central to reflexive governance' (Dryzek and Pickering, 2017, p. 354; see also Scherer and Voegtlin, 2020). Indeed, deliberation has become one of the most widely held approaches in political science and beyond (see e.g., Bächtiger et al., 2018; Dryzek et al., 2019; Fishkin, 2018) and has been used in governance solutions to GSCs, such as climate change (Lidskog and Elander, 2010), renewable energy (Fast, 2013), labour protection (Fung, 2003), and land-use policies (Van Den Hove, 2006), among others. Deliberation has been proposed as a way to balance governance tensions between seemingly opposing governance directives in the effort of integrating stakeholders and allowing for reflexivity (Dryzek and Pickering, 2017).

These governance tensions relate, first, to sources of knowledge, creating tension between public participation and expertise, whereby firms need to secure broad public acceptance for their innovation while including a limited number of stakeholder experts for idea generation and implementation. Firms innovating in areas that are sensitive to the public, such as in new, disruptive technologies like nanotechnology, genetic engineering, or artificial intelligence (Novitzky et al., 2020), especially face the challenge of balancing the inclusion of public concerns and scientific expertise.

Second, governance tensions emerge around the composition of discourse participants, creating tension between diversity and consensus. While a variety of different voices serves as a source of inspiration, creativity, and experimentation, which are crucial for innovation, the diffusion and implementation of ideas that seek to address GSCs imply a certain degree of consensus without which it would be impossible to implement the necessary changes. Open innovation projects are great examples of this tension because they need to manage a variety of inputs while remaining able to agree on a specific direction at some point. Reflexive governance should be able to accommodate multiple

perspectives, including those of stakeholders with limited or marginal voice, while retaining the ability to agree on a specific course of action.

Third, governance faces the tension between centralization and decentralization in the institutional architecture. Ideally, firms allow the emergence of bottom-up, decentralized innovation by creating the appropriate structures. However, they need to be able to funnel these initiatives through steering and centralizing processes (Ostrom, 2010). This is similar to challenges created by the structural separation of organizational functions that makes it more difficult to access and channel information for strategic decision-making (Gibson and Birkinshaw, 2004).

Fourth, and related to the above, governance tensions emerge from institutional dynamics, creating tension between flexibility and stability. Reflexive governance needs to balance the flexibility of reacting and adapting to changes in the environment (Ferraro et al., 2015) while guaranteeing a certain degree of stability in planning and execution (Schreyögg and Steinmann, 1987). This relates to the incorporation of feedback loops from the environment and the ability to adapt predefined strategic plans. As we outline below, deliberative capacities in governance – structures and processes that allow drawing on the exchange with those having a stake in the innovation process and outcome with the aim of producing reasonable and well-informed opinions (Chambers, 2003, p. 309; Dryzek, 2009) – can help manage these tensions (see also Dryzek and Pickering, 2017).

Grand societal challenges and reflexive governance. The characteristics of GSCs pose tensions similar to the tensions arising through reflexivity (see also Table I). In order to approach the *complexity* of GSCs, firm innovation processes and governance need to become more complex themselves (Schneider et al., 2017), spanning multiple domains, locations, and time frames, and more dynamic and nonlinear. This creates the tension for companies between *decentralized* innovation structures and processes that can accommodate a variety of innovation inputs from actors across different domains and geographic locations, and the *centralization* of these inputs into concrete, impactful, and firm-wide innovation outcomes. Further, it creates the tension between *flexibility* in their structures and processes to respond to the dynamic character of GSCs and *stability* in decision-making and strategic planning.

As a solution, building deliberative capacities through corporate governance (Scherer et al., 2013; Scherer and Voegtlin, 2020), as well as global governance (Scherer and Palazzo, 2011), can create slack resources that can selectively either open up or close down the innovation process for stakeholders. Such deliberative capacities can be built by creating processes to encourage bottom-up innovation throughout the organization, experimenting with forms of open innovation, and encouraging regular exchanges and feedback from stakeholders. Deliberation can function as a learning mechanism that relates information from local, decentralized initiatives to those with decision-making authority in that it fosters communicative exchanges among the different parties and allows for local knowledge to be shared (Dryzek and Pickering, 2017). Moreover, deliberation can enable the periodic review of strategic plans and innovation efforts if it is used to create occasional exchanges with stakeholders with the aim of reflecting on the strategic direction and the goals of innovation. This allows

firms to oscillate between stability and flexibility and between higher-loop learning and feedback loops (Senge, 1990).

In turn, the *uncertainty* that accompanies GSCs also creates uncertainty about to the effect of innovative responses to these challenges. As a solution, business firms can secure broad-based social acceptance for their innovation by incorporating as much expert knowledge on the topic as possible. Of course, this can create the tension of accommodating *public participation* and relying on selective *expertise*, but it can again be managed by deliberative capacity (Dryzek, 2009) – the potential to draw on various forms of deliberation when necessary. This capacity can be created by establishing relationships and accumulating social capital with stakeholders, providing resources to engage in wider public discourse through information campaigns, focus groups, citizenship fora, as well as a sustainability agenda that creates transparency, in addition to a pre-established network of experts.

Firms can also make attempts to join expert and public deliberation. Research on deliberation has shown that if informed correctly, the lay public develop well-reasoned and valid standpoints (Dryzek et al., 2020), and that 'ordinary citizens can grapple effectively with expert knowledge, while at the same time not leaving behind their own ordinary knowledge and varied lay perspectives' (Dryzek and Pickering, 2017, p. 356). Crucially in that case, broader participation can help question organizational blindness, rigid thinking, and experts thinking in silos as well as advance deliberative learning processes (Dryzek and Pickering, 2017). As a case in point, to facilitate its transition to an 'entreprise à mission' status, tying the corporation to a mission or purpose, and to support its social and environmental objectives, in 2018 Danone launched the 'One Person, One Voice' Program – an innovative governance and employee engagement model to empower employees to co-own the company's 2030 sustainable development agenda. The program relies on an internal digital platform with extensive sharing and learning resources related to Danone's sustainability strategy, goals, and initiatives. Each year, employees are invited to share their ideas with the members of the Board of Directors and the Executive Committee and to engage in discussions to feed into Danone's sustainability strategy and drive innovation (Danone, 2021).

Finally, GSCs are *value-laden and socially constructed*. Different actors have different views about their nature, their drivers and consequences; different ideas about their relevance and urgency; and different value systems for judging them (Ferraro et al., 2015). Consequently, this affects the evaluation of RI efforts, whereby firms face the tension between including a *diversity* of perspectives to access knowledge and secure legitimacy, and generating a *consensus* to pursue a given path. Deliberation scholars suggest that in order to manage this tension, firms should build meta-consensus, which refers to 'agreement on the legitimacy of disputed values, the credibility of disputed beliefs, the nature of disputed choices (including the range of acceptable options), and the acceptable range of contested discourses' (Dryzek and Pickering, 2017, p. 357). Once stakeholders acknowledge the perspectives of the others involved, firms can work on agreements across various stakeholder groups, with the insight that a workable agreement is better than no agreement (Curato et al., 2017).

Multi-stakeholder, global governance initiatives often provide great examples of such meta-consensus on sustainability issues. Consider the evolution of the discourse on the

issue of child labour that began with accusations of NGOs and denial by business firms and moved to agreeing on a common understanding that child labour is not to be tolerated, including the definition of different forms of child labour (see, e.g., the definition by the ILO; https://www.ilo.org/ipec/facts/lang--en/index.htm). It also led to the establishment of multi-stakeholder industry standards that define the range of acceptable options (e.g., the Clean Clothing Campaign; https://cleanclothes.org/).

Again, deliberative capacities can be leveraged to create such meta-consensus, identify alternative options, and develop creative solutions. It is essential to facilitate a dialogue on underlying values, assumptions, and definitions related to GSCs and to engage in 'values work': efforts aimed at changing practices of saying and doing in organizations related to what is considered normatively right or wrong, good or bad (Gehman et al., 2013; Vaccaro and Palazzo, 2015). In turn, to discuss these fundamental questions, pre-established connections and exchanges with stakeholders can help build the necessary trust. An example mentioned above is the area of microfinance: it would have been helpful to establish a common understanding or agreement on what poverty is before beginning to assess the impact of microfinance on this particular GSC.

RESPONSIBLE INNOVATION STRUCTURE, PROCESS, AND OUTCOMES

In this section we point out how specific aspects related to the RI structure, process, and outcomes can be organized more reflexively to build deliberative capacities and engage with the intricacies of GSCs.

Innovation Structure

The institutional structure around the governance of innovation remains largely in the hands of national governments and consequently, is often codified into hard law, and relies on rigid risk-management frameworks. For example, the United Nations' SDGs see national governments as the driver of action and establish only derivative roles for firms and NGOs, or other civil society groups. In turn, firms respond to (national) innovation regulations by establishing compliance rules and frameworks for the innovation process. This process is relatively static, centralized, and not very adaptable to feedback, and is therefore insufficient for addressing the complexity and uncertainty of GSCs.

Innovation regulation in general faces the temporal challenge in that the pace of innovation exceeds regulators' response to it (Grinbaum and Groves, 2013). This challenge is even more pronounced for innovation that is disruptive and transformational (Hopwood et al., 2005) because such innovation will more likely produce unprecedented uses, products, or processes and be impactful beyond single nation-states. An example is the pace, unprecedentedness, and reach of digital innovation (see critically, Zuboff, 2019). Thus, risk management frameworks and hard law regulation are a necessary, but not sufficient condition to facilitate innovations that 'avoid harm' and 'do good'.

As a complement to hard law regulation, business firms seeking to achieve more sustainable practices have explored self-regulation through global governance initiatives based on multi-actor collaborations (Haack and Scherer, 2014; Rasche et al., 2013). The resulting voluntary standards of good business conduct, considered as soft law, have become a relevant addition to hard law regulation. The RI framework proposes to explore and leverage the interplay between soft and hard law in regulating and incentivizing innovation to address GSCs. The complementarity of soft and hard law can help manage the governance tension between decentralization and centralization, by allowing the emergence of decentralized, industry- or-issue specific soft-law regulation in combination with the centralized, national hard-law legal system.

Moreover, considering soft law and global governance a necessary complement to national regulation can help with institutionalizing aspects of flexibility and stability – another governance tension. While soft law issued through global governance regimes and self-regulatory industry standards is more flexible and adaptable to emerging needs and trends and more global in its reach, it often lacks enforcement and commitment to the cause required by national regulation. However, global governance initiatives can provide alternative positive incentives for self-regulation and innovation. For example, innovation diplomacy, understood as the use of diplomacy to further innovation (Ternes et al., 2020), has been suggested as a means to 'build academic partnerships with industry, enabling open innovation and collaboration, influencing intellectual property regimes, building global value chains, and developing and scaling innovative solutions to global problems' (Eyre et al., 2020, p. 729) for RI in mental health care.

Further, global governance initiatives can help firms build deliberative capacities by establishing multi-stakeholder networks they can leverage for either broad support or specific expertise and to engage in 'values work' to reach a shared understanding of the issues at stake. For instance, in the field of biotechnology, global governance informed by a deliberative assembly composed of lay citizens has been suggested as a mechanism for addressing the ethical and scientific issues arising from genome editing (Dryzek et al., 2020; see also the Special Issue article by Waldron and colleagues, 2020, for conditions under which activist organizations can pressure firms to engage in RI).

At the firm level, businesses can use corporate governance to build deliberative capacities and facilitate RI (Scherer and Voegtlin, 2020; Stilgoe et al., 2013). Corporate governance can create individual and structural conditions for deliberation and reflexivity by including stakeholders with various perspectives and providing arenas for discourse. Here again, it would be helpful to institute the capacities for selective stakeholder engagement by establishing the stakeholder network, providing the arenas for regular exchanges, and accumulating social capital and trust. Compliance-based governance can be amended by checks and balances through the involvement of actors having different goals. Examples range from more formal institutions of stakeholder engagement, such as a stakeholder advisory board, to informal exchanges by the CSR department. Moreover, longer-term-oriented incentives for top management can allow the inclusion of feedback and the correction of a given course in achieving the desired future goals (Scherer and Voegtlin, 2020; see also the discussion of Bacq and Aguilera, 2021, on stakeholder governance in our Special Issue).

Innovation Process

A core premise of RI definitions and frameworks (Blok, 2019; Scherer and Voegtlin, 2020; Stilgoe et al., 2013; von Schomberg, 2011) has been the idea of opening up the innovation process to stakeholders as early as possible and throughout the innovation process in order to define the goals of innovation, access knowledge, secure legitimacy, identify possible harmful and beneficial uses of the innovation, and minimize its risk. We argue that such an early and continuous involvement should not result in stakeholder engagement at any cost but should be directed toward building deliberative capacities to allow selective forms of stakeholder deliberation that can help with the concrete governance challenge in a specific situation related to GSCs.

Open innovation and entrepreneurship research already considers it important to include the end user or customer early on and throughout the process in order to secure the success of the innovation or the new venture. It acknowledges that '[u]ser-centered innovation is steadily increasing in importance as computing and communication technologies improve' (von Hippel, 2005, p. 121) and thereby can 'accelerate internal innovation, and expand the markets for external use of innovation' (Chesbrough, 2006, p. 1). In addition, entrepreneurship research and practice has often emphasized lean start-up methods that focus on including customers as early as possible in order to be able to understand their needs and to 'pivot' the innovation through fast, iterative, incremental product development (Ries, 2011; Shepherd and Gruber, 2021). The goal is to ensure that the novel product or service in the end delivers actual value to customers.

The same logic can be applied to the goals of minimizing harm and improving societal benefits by adopting a RI process. However, rather than focusing on user- or customer-centered innovation, research on RI could emphasize a broader 'stakeholder-centered' innovation process that allows for more purposeful, informed, and legitimate innovation. In turn, open innovation and lean innovation processes can help create polycentric structures and facilitate the involvement of outside experts – aspects that are conducive to solutions to complex and uncertain GSCs. Further, the involvement of stakeholders after each iteration of the novel product or service can create flexibility and possibilities to incorporate feedback.

It is important to allow the inclusion of diverse stakeholder voices and the possibility for public participation, especially when innovating in contested areas that face public scepticism (as, e.g., in the fields of synthetic biology, nanotechnology, genetic engineering, automation and robotics, and artificial intelligence) or in understudied contexts, such as developing countries. The RI process can be supported in parallel by deliberative fora that aim for meta-consensus (e.g., Dryzek et al., 2020; Owen and Goldberg, 2010). Finally, reflexivity and deliberative capacities can help firms combine these opening processes with the need for closure. This involves the centralization of open innovation efforts and outcomes, consensus on the need for and societal relevance of the innovation, and a certain stability in pursuing the innovation and its social and economic benefits (see, e.g., the Special Issue article by Rauch and Ansari, 2021, that studies an open innovation process).

Innovation Outcomes

Traditionally, innovation regimes and regulation follow the logic of the private investment model in order to incentivize businesses to innovate by guaranteeing the appropriation of innovation outcomes – economic profit – through intellectual property rights (Granstrand, 2005; von Hippel and von Krogh, 2003). Business innovation is considered a private good; this also holds true for most social innovation, which is developed most often through social entrepreneurial ventures. Similarly, strategic approaches to CSR use innovative CSR as a way to secure competitive advantages, trying to reap the economic benefits (McWilliams and Siegel, 2001).

In the context of RI and GSCs, the notion that innovation benefits should accrue exclusively to private investors is potentially limiting because innovation aimed at 'doing good' and targeting broader GSCs often relates to the provision of seemingly non-exclusive, non-rival public goods, such as a healthy global climate, clean air, access to drinking water, or quality education. Consequently, RI is concerned with the experimentation of alternative forms of appropriation and incentivization of business innovation (Voegtlin and Scherer, 2017). For example, the new EU research-funding agenda under the Ninth Framework Program, Horizon Europe (2021–27), calls for 'efforts to increase responsiveness of science to society through elements of the so-called "three O's agenda" (i.e., open innovation, open science, openness to the world)' (Novitzky et al., 2020, p. 39); and, at the World Trade Organization, in the fight against COVID-19, the US government supported the initiative of South Africa and India to waive patent protections for COVID-19 vaccines to bridge the gap between vaccination rates in rich and poor nations (Maxmen, 2021).

Research on intellectual property rights has periodically challenged the private investment model (Grinbaum and Groves, 2013; von Hippel and von Krogh, 2003) and questioned whether these rights lead to over- or underinvestment in innovation from a societal standpoint (Granstrand, 2005). While it argues that appropriability problems can lead firms to getting caught up in 'waiting games', resulting in underinvestment, prospects of quick success can lead to 'patent races' and overinvestment (Granstrand, 2005, p. 15). As an alternative, researchers have proposed a 'collective action model' that aims to foster innovation under conditions of market failure and that seeks the provision of public goods (von Hippel and von Krogh, 2003). For example, open-source software represents innovations springing from collective action. Reflexive RI can help identify conditions that foster collective action and non-exclusionary innovation, leveraging the effects of reputational incentives, information advantages, and learning opportunities to engage with the complexity, uncertainty, and value-laden aspects of GSCs.

Overall, the RI dimensions we propose have implications for research, business practice, and policymaking. The transition to RI in and throughout business requires (1) adapting forms of governance to facilitate such innovation; (2) reorganizing the innovation process based on stakeholder involvement; (3) finding alternative ways of reaping innovation benefits beyond property rights regimes; (4) mixing integrity- and compliance-based frameworks, and soft and hard law regulations; and (5) increasing vertical and horizontal collaboration between private and public actors (see e.g., the Special Issue

article by Bacq and Aguilera that explores corporate governance and stakeholder involvement to facilitate RI, the article by Rauch and Ansari that investigates open innovation providing medical solutions, or the article by Ambos and Tatarinov that focuses on intrapreneurship for RI in an international organization). The move toward more RI therefore brings tensions but also potential synergies for the actors involved in the innovation process when navigating between openness and closure, trying to avoid harm and doing good, and aiming for effectiveness, efficiency, and legitimacy. These aspects require further research and subsequent changes in business innovation management and in innovation practices and policies. Below we outline examples, theoretical access points, and future research directions.

Grand Societal Challenges and Responsible Innovation: The Case of COVID-19

COVID-19 provides an exemplary case for illustrating the characteristics of GSCs (see, e.g., Howard-Grenville, 2021) and the potential responses of reflexive RI. In particular, it has uncovered the complexity of assessing the impact and implications of a global GSC, interrelationships, and trade-offs with regard to other GSCs (e.g., climate change, poverty, or other pandemics like Ebola: see, e.g., the Special Issue article by Arslan and Tarakci, 2020), secondary implications (e.g., for the economy), and the complexity of the responses. COVID-19 also illustrated the uncertainty of a GSC, for instance related to the development of the virus and its mutations, the difficulties in predicting its spread, and the measures taken to counter it, and, in general, the unforeseen and incalculable effects of the proposed solutions. Moreover, COVID-19 has highlighted the value-laden character of a GSC, ranging from difficulties in understanding its nature to evaluating its risks to reaching consensus on how to tackle the pandemic. It has showed the difficulties in the ethical assessment of the value of health compared with other human rights and has led to different socially constructed responses, ranging from strict measures of self-isolation to ignoring the virus to trivializing it and even to instilling beliefs in a global conspiracy.

Further, the pandemic has revealed challenges as well as opportunities for reflexive RI. It has led to discussions of and experimentation with different degrees of decentralization and centralization between local and national governments and their respective competencies in the fight against COVID-19, demonstrating how collective efforts can be vertically (across local, regional, and national governance levels) and horizontally (across public, private, and civil society sectors) distributed and integrated, and the advantages and disadvantages of federal versus centralized government (Scherer and Voegtlin, 2020). For example, consider the vaccine development and distribution process in the US: Operation Warp Speed was a public–private partnership initiated by the US government to facilitate and accelerate the development, manufacturing, and distribution of COVID-19 vaccines, therapeutics, and diagnostics.

COVID-19 has also showed the need for flexibility and for incorporating feedback, for example on the effectiveness of countermeasures, as well as the need for stability of future planning, a functioning economy, and public reassurance. Further, it has highlighted the capacity to draw on various sources of knowledge, ranging from expert knowledge of virologists to public participation in providing information on the spread of the virus

via contact-tracing applications. This includes the balance between expert dialogue and public participation in securing the legitimacy of the respective measures and, thus, between diversity in the composition of discourse participants and the challenge of establishing a meta-consensus on the nature and hazardousness of the virus (see e.g., Bansal et al., 2021; Crane and Matten, 2021; Nohria, 2020). Finally, the vaccine innovation has opened up discussions on the need for adapted measures in innovation risk management (clinical trials), collaborative efforts in innovation process itself, and global discussions on waiving patents to foster more open and collaborative innovation.

STUDYING GRAND SOCIETAL CHALLENGES AND RESPONSIBLE INNOVATION: THE SPECIAL ISSUE CONTRIBUTIONS

After establishing the link between GSCs and RI, we now turn to questions of how to study this link in general, and RI in particular. We use our Special Issue contributions as illustrations of how these complex links can be successfully approached.

Bacq and Aguilera (2021) explore governance mechanisms for organizations and their heterogeneous stakeholders with the aim of pursuing RI. They emphasize that the extant corporate governance literature falls short in facilitating RI because of a narrow economic value concept; imbalances between value creation, appropriation, and distribution; and neglect of participatory coordination mechanisms. They revisit fundamental questions on value creation ('what value to create and for whom?'), appropriation ('how to appropriate?') and distribution ('how to distribute?') and propose a new model of stakeholder governance designed to foster RI. They draw from value-based strategy and stakeholder perspectives, combining them with insights from deliberative democracy research. Their conceptual model explores how value 'travels' from creation to distribution; how four distinct types of stakeholders, differentiated along their power sources as unintended, empowered, enfranchised, or entitled, participate in the focal organization's decision-making; and how this affects the appropriation and distribution of value. Ultimately, they formulate four propositions on four stakeholder-governance mechanisms (isolating mechanisms, disseminating mechanisms, claimancy rights and moral issues, mission-driven rights) that help foster RI.

Rauch and Ansari (2021) study the non-profit medical platform *Patient Innovation* that provides a knowledge commons for sharing information about innovative, yet often simple, medical solutions to rare diseases and care-related problems. Originally an academic project established to deliver findings and provide knowledge for scientific publications, it evolved into a large-scale RI initiative that benefits from collaborators from over 60 countries and knowledge on over 850 solutions for treatment and care. The authors conduct a qualitative case study to explore the conditions and mechanisms of organizational repurposing, from self-serving scholarly activities of academics to an endeavour that pursues collective goals and works for the benefit of the society. They apply a framing theory lens and identify three mechanisms that explain the unexpected drifts toward social impact: (1) serendipity that fosters creativity and reflection in core actors, (2) moral emotions that redirect actors' intentions from self-serving goals to collective goals, and, finally, (3) the power of socially conscious users and catalysts that further push toward organizational repurposing. They

add important insights to the RI literature by emphasizing the role of spontaneity, exploring the aforementioned mechanisms, and highlighting the relevance of open platforms for the dissemination of RI.

Ambos and Tatarinov (2021) also explore the links between GSCs and RI. They investigate how intrapreneurship in an international organization can help balance the governance tension between decentralization and centralization and indeed develop RI capability: an assemblage of routines and processes that allow an organization to systematically recognize and exploit opportunities while pursuing social goals and doing no harm. Drawing on unique data from eight case studies for five of the largest UN organizations, they analyse how intrapreneurial initiatives help foster RI. By focusing on nonprofit intrapreneurship and characterizing its tensions, scaling patterns, and outcomes, they show how different intrapreneurial scaling mechanisms mitigate concrete tensions in the organization between 'doing good' and 'doing no harm'. Perhaps most interestingly, they find that digital solutions can help create transparency and increase the ability of organizations to collaborate with all diverse stakeholders involved in RI throughout the process. Given that international organizations (as well as business firms) often work in developing countries with poor infrastructure, digital solutions help connect with remote communities to overcome disadvantages of physical distance and empower citizens, thus addressing several interdependent GSCs.

In a paper that has major implications for RI in the health care sector – specifically, the management of global pandemics such as COVID-19 – Arslan and Tarakci (2020) investigate how temporal changes in the salience of a GSC affect performance of RI partnerships formed in response to the 2014 Ebola outbreak; they also study possible spill-over effects on partnership performance in other, related domains (e.g., development of drugs for influenza virus). Their central argument is that an abrupt shock increases the salience of a GSC, after which normative pressures are exerted by various stakeholder groups, increasing the expected net benefits of addressing them. As a result, organizations allocate more resources and align partnership incentives, which, in turn, foster innovation performance. In line with their predictions, the authors find that while the innovation performance of Ebola partnerships formed after the outbreak rose eleven-fold, the performance of partnerships treating influenza virus – another GSC – fell significantly. The study thus cautions against overreacting to salience shifts among GSCs because an exogenous shock increases the innovation performance of partnerships in the focal domain experiencing the shock at the expense of performance in the domain of a related GSC.

Finally, drawing on social movement theory and the in-depth empirical examination of six campaigns of activist organizations, Waldron et al. (2020) develop a theory of activist-driven RI.[1] They show how these activist organizations use specific claims about unsustainable firm behaviour and its consequences to pressure resistant firms to engage in RI. They find that it is the types of claims, the pressure mechanisms applied, the time when these claims are made over the change process, and the characteristics of the activist organizations and the firms themselves that decide whether firms react to the stakeholder pressure and adopt more socially and environmentally responsible practices. The authors show the important role of outside stakeholder pressure and identify conditions under which firms react to such pressure. Their results highlight the complexity of and uncertainty in stakeholder–firm interaction and emphasize the important role of

time in this process. They also point to different socially constructed assessments of firm actions with regard to sustainable development and how these discrepancies can question the legitimacy of firm behaviour and drive change. Activist-driven pressure is shown to be a way to challenge predefined strategic directions taken by firms, especially when these firms are missing more collaborative, deliberative approaches to stakeholder engagement. The authors discuss the wider implications of their findings for RI and GSCs.

MOVING THE FIELD FORWARD: TOWARD A FUTURE RESEARCH AGENDA

Each of the Special Issue contributions address interesting and relevant research questions and provide valuable research insights. However, we believe there is much more to be done. Table II summarizes the relevant research questions that we deem pertinent for moving research on GSC and RI forward. These questions unfold at different levels of analysis (and across levels of analysis) and should help us better understand the mechanisms and conditions under which RI can contribute to mitigating or even solving GSCs (see also Voegtlin and Scherer, 2019, for a discussion of industry sector-related RI challenges).

In addition to multi-level research, and because RI is a relatively new idea in management and organization research, there is an urgent need for further theoretical grounding. There are many ways to leverage management and organization theories in order to study RI and its links to GSCs, the most common among them stakeholder theory and theories of innovation and change. In addition, traditional management theories across various levels of analysis can be used to explain different aspects of RI and its environment: for example, institutional theory at the societal level, resource-dependence theory at the firm level, and theories of organizational behaviour or framing at the individual level. In this introduction to the special issue, we leveraged political theory and introduced ideas of reflexivity and deliberative capacity to inform RI governance, processes, and practices. The articles herein draw on manifold theoretical lenses that exemplify what can be leveraged to explore the relationships between GSCs and RI, among them social movement theory, issue salience, framing theories, value-based strategy, stakeholder approach, and deliberation theory.

As mentioned above, we believe that the complex questions posed by RI and GSCs require complex solutions, and we therefore encourage dialogue between scholars from a variety of disciplines and management researchers. We could, for instance, envision fruitful collaborations of management scholars with scholars of *political science and public administration*, to tackle questions related to the impact of policy implications and the influence of the political process on RI in business firms. Political science theories can inform research on how to implement elements of deliberation, participation, and reflexivity for innovation management (e.g., Bächtiger et al., 2018; Fishkin and Luskin, 2005; Fishkin and Mansbridge, 2017), and research on deliberative democracy can provide relevant insights for the governance of RI (e.g., Dryzek et al., 2020; Dryzek and Pickering, 2017), as shown in our discussion above.

Legal scholars can help address questions of regulation of GSC and RI, and how the relationship between soft law and hard law can be orchestrated to successfully foster RI. *Ethical philosophers* can inform RI in the area of artificial intelligence and machine learning to determine the right 'ends' to program machines and algorithms

Table II. Future research directions

Areas in need of future research	*Exemplary future research questions*
The Nature, Consequences and Context of Responsible Innovation	What are the relevant drivers of responsible innovation and under what conditions will these drivers facilitate responsible innovation?
	What are the conditions that contribute to incremental and to radical innovation for sustainable development?
	How can we measure responsible innovation in businesses and its impact on the grand societal challenges?
	Under what conditions can new forms of doing business and new forms of innovation (e.g., open innovation, collective innovation, digitalization, sharing economy, etc.) contribute to solving the grand societal challenges?
Macro-Level – Institutional Dynamics Related to Responsible Innovation	What is the influence of politics (access to and involvement of business in the political process), policy (national legislation related to grand societal challenges), and polity (institutional political framework, regime type, form of capitalism, etc.) on responsible innovation?
	What are the implications of recent societal developments (e.g., emerging nationalism, fundamentalism and populism or the post-fact/truth era) for responsible innovation? How and why can these developments foster or hinder responsible innovation?
	Under what conditions do global governance initiatives work best to foster responsible innovation for the grand societal challenges? How can hard-law and soft-law work together to encourage responsible innovation?
	What is the influence of the SDGs on research and development in business firms?
Meso-Level – Organizing for Responsible Innovation	What is the impact of different (and novel) organizational forms on responsible innovation (e.g., MNCs and SMEs, new corporate ventures, hybrid organizations, state-led firms, purpose driven corporate forms and benefit corporations, etc.)?
	How can responsible innovation be financed and under what conditions does which form of capital work best (e.g., what is the role of innovative forms of financing, like B-corp equity, crowdfunding, impact investment, etc.)?
	What forms of (innovative) corporate governance can facilitate responsible innovation?
	What are intra-organizational challenges of responsible innovation and how can R&D be linked to the grand societal challenges?

Table II. (Continued)

Areas in need of future research	*Exemplary future research questions*
Micro-Level – The Individual Contributing to Responsible Innovation	What facilitates innovative behavior that targets the grand societal challenges?
	How does individual behavior contribute to responsible innovation across levels-of-analysis?
	Which forms of leadership and team dynamics contribute to responsible innovation?
	What role does the entrepreneurial identity play in responsible innovation?
	How does CEO political activism relate to responsible innovation and sustainable development?

(a discussion that is also relevant in the event of automated, self-driving cars). Further, *sociologists* and (population) *geographers* can contribute insights on the relationship between changes in consumption, values in society, migration flows, growing populism and nationalism, and RI.

Finally, insights from *natural sciences* can help us assess the possibilities of technological innovation, operationalize their contribution to the resolution of GSCs, show the interdependence of systems, and measure the impact of innovation on GSCs, as well as the potential harm and beneficial societal impact of business innovation. The planetary boundaries framework provides an access point in this regard (Steffen et al., 2015) in addition to more targeted initiatives that relate GSCs to strategic business opportunities such as the gap frame (Muff et al., 2017).

CONCLUSION

Scholarly research should lead the way in advancing solutions to GSCs, and we aim for this Special Issue to offer exemplary guidance in this regard. In this introduction to the *Journal of Management Studies* Special Issue 'Grand Societal Challenges and Responsible Innovation', we have provided an overview of existing approaches to addressing GSCs through RI, discussed research gaps and open questions in this literature, and illustrated how the articles fill some of these gaps. We propose the ideas of reflexivity and deliberative capacity as a potential way to account for the characteristics of GSCs through RI. We hope to inspire future research to help us better understand the role of business organizations and RI in real change toward sustainable development.

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REFERENCES

Aguilera, R. V., Rupp, D. E., Williams, C. A. and Ganapathi, J. (2007). 'Putting the S back in corporate social responsibility: A multilevel model of social change in organizations'. *Academy of Management Review*, **32**, 836–63.

Ambos, T. C. and Tatarinov, K. (2021). 'Building responsible innovation in international organizations through intrapreneurship'. *Journal of Management Studies*. https://doi.org/10.1111/joms.12738

Arslan, B. and Tarakci, M. (2020). 'Negative spillovers across partnerships for responsible innovation: Evidence from the 2014 Ebola outbreak'. *Journal of Management Studies*. https://doi.org/10.1111/joms.12607

Avelino, F., Wittmayer, J. M., Pel, B., Weaver, P., Dumitru, A., Haxeltine, A., Kemp, R., Jørgensen, M. S., Bauler, T., Ruijsink, S. and O'Riordan, T. (2019). 'Transformative social innovation and (dis)empowerment'. *Technological Forecasting and Social Change*, **145**, 195–206.

Bächtiger, A., Dryzek, J. S., Mansbridge, J. and Warren, M. E. (2018). *The Oxford Handbook of Deliberative Democracy*. Oxford: Oxford University Press.

Bacq, S. and Aguilera, R. V. (2021). 'Stakeholder governance for responsible innovation: A theory of value creation, appropriation, and distribution'. *Journal of Management Studies*. https://doi.org/10.1111/joms.12746

Bansal, P., Grewatsch, S. and Sharma, G. (2021). 'How COVID-19 informs business sustainability research: It's time for a systems perspective'. *Journal of Management Studies*, **58**, 602–06.

Bansal, P. and Song, H.-C. (2017). 'Similar but not the same: Differentiating corporate sustainability from corporate responsibility'. *Academy of Management Annals*, **11**, 105–49.

Blok, V. (2019). 'From participation to interruption: Toward an ethics of stakeholder engagement, participation and partnership in corporate social responsibility and responsible innovation'. In von Schomberg, R. and Hankins, J. (Eds), *International Handbook on Responsible Innovation*, 1st edition. Cheltenham: Edward Elgar Publishing, 243–57.

Buhmann, K. (2010). *Reflexive Regulation of CSR to Promote Sustainability: Understanding EU Public-Private Regulation on CSR through the Case of Human Rights*. Oslo: University of Oslo Faculty of Law Research Paper.

Cao, K., Gehman, J. and Grimes, M. G. (2017). 'Standing out and fitting in: Charting the emergence of certified B Corporations by industry and region'. In Andrew, C. C. and Jerome, A. K. (Eds), *Hybrid Ventures*. Cheltenham: Emerald Publishing Limited, **19**, 1–38.

Chambers, S. (2003). 'Deliberative democratic theory'. *Annual Review of Political Science*, **6**, 307–26.

Chesbrough, H. (2006). 'Open innovation: A new paradigm for understanding industrial innovation'. In Chesbrough, H., Vanhaverbeke, W. and West, J. (Eds), *Open Innovation: Researching a New Paradigm*, 1st edition. Oxford: Oxford University Press, 1–19.

Choi, N. and Majumdar, S. (2014). 'Social entrepreneurship as an essentially contested concept: Opening a new avenue for systematic future research'. *Journal of Business Venturing*, **29**, 363–76.

Crane, A. and Matten, D. (2021). 'COVID-19 and the Future of CSR Research'. *Journal of Management Studies*, **58**, 280–84.

Crane, A., Palazzo, G., Spence, L. J. and Matten, D. (2014). 'Contesting the value of "creating shared value"'. *California Management Review*, **56**, 130–49.

Curato, N., Dryzek, J. S., Ercan, S. A., Hendriks, C. M. and Niemeyer, S. (2017). 'Twelve key findings in deliberative democracy research'. *Daedalus*, **146**, 28–38.

Dacin, P. A., Dacin, M. T. and Matear, M. (2010). 'Social entrepreneurship: Why we don't need a new theory and how we move forward from here'. *Academy of Management Perspectives*, **24**, 37–57.

Danone. (2021). *Danone Goals by 2030*. Available at https://www.danone.com/about-danone/sustainable-value-creation/our-company-goals.html (accessed 27 September 2021).

Doh, J., Husted, B. W. and Marano, V. (2019). 'Corporate social responsibility in emerging markets'. In McWilliams, A., Rupp, D., Siegel, D. S., Stahl, G. K. and Waldman, D. (Eds), *The Oxford Handbook of Corporate Social Responsibility: Psychological and Organizational Perspectives*, 1st edition. Oxford: Oxford University Press, 637–58.

Dryzek, J. S. (2009). 'Democratization as deliberative capacity building'. *Comparative Political Studies*, **42**, 1379–402.

Dryzek, J. S., Bächtiger, A., Chambers, S., Cohen, J., Druckman, J. N., Felicetti, A., Fishkin, J. S., Farrell, D. M., Fung, A., Gutmann, A., Landemore, H., Mansbridge, J., Marien, S., Neblo, M. A., Niemeyer, S., Setälä, M., Slothuus, R., Suiter, J., Thompson, D. and Warren, M. E. (2019). 'The crisis of democracy and the science of deliberation'. *Science*, **363**, 1144–46.

Dryzek, J. S., Nicol, D., Niemeyer, S., Pemberton, S., Curato, N., Bächtiger, A., Batterham, P., Bedsted, B., Burall, S., Burgess, M., Burgio, G., Castelfranchi, Y., Chneiweiss, H., Church, G., Crossley, M., de Vries, J., Farooque, M., Hammond, M., He, B., Mendonça, R., Merchant, J., Middleton, A., Rasko, J. E. J., Van Hoyweghen, I. and Vergne, A. (2020). 'Global citizen deliberation on genome editing'. *Science*, **369**, 1435–37.

Dryzek, J. S. and Pickering, J. (2017). 'Deliberation as a catalyst for reflexive environmental governance'. *Ecological Economics*, **131**, 353–60.

Ebrahim, A. and Rangan, V. K. (2014). 'What impact? A framework for measuring the scale and scope of social performance'. *California Management Review*, **56**, 118–41.

EU. (2021). *Responsible Research and Innovation*. Available at https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation (accessed 11 August 2021).

Eyre, H. A., Ellsworth, W., Fu, E., Manji, H. K. and Berk, M. (2020). 'Responsible innovation in technology for mental health care'. *The Lancet Psychiatry*, **7**, 728–30.

Fast, S. (2013). 'A Habermasian analysis of local renewable energy deliberations'. *Journal of Rural Studies*, **30**, 86–98.

Ferraro, F., Etzion, D. and Gehman, J. (2015). 'Tackling grand challenges pragmatically: Robust action revisited'. *Organization Studies*, **36**, 363–90.

Filatotchev, I., Ireland, R. D. and Stahl, G. K. (2021). 'Contextualizing management research: An open systems perspective'. *Journal of Management Studies*. https://doi.org/10.1111/joms.12754

Fishkin, J. S. (2018). *Democracy When the People are Thinking: Revitalizing Our Politics Through Public Deliberation*. Oxford: Oxford University Press.

Fishkin, J. S. and Luskin, R. C. (2005). 'Experimenting with a democratic ideal: Deliberative polling and public opinion'. *Acta Politica*, **40**, 284–98.

Fishkin, J. S. and Mansbridge, J. (2017). 'The prospects and limits of deliberative democracy: Introduction'. *Daedalus*, **146**, 6–13.

Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Boston, MA: Pitman.

Fu, R., Tang, Y. and Chen, G. (2020). 'Chief sustainability officers and corporate social (Ir)responsibility'. *Strategic Management Journal*, **41**, 656–80.

Freiberg, D., Rogers, J. and Serafeim, G. (2020). *How ESG Issues Become Financially Material to Corporations and Their Investors*. Harvard Business School Accounting & Management Unit Working Paper.No. 20-056, 1–36.

Fung, A. (2003). 'Deliberative democracy and international labor standards'. *Governance*, **16**, 51–71.

Gehman, J., Trevino, L. K. and Garud, R. (2013). 'Values work: A Process study of the emergence and performance of organizational values practices'. *Academy of Management Journal*, **56**, 84–112.

George, G., Howard-Grenville, J., Joshi, A. and Tihanyi, L. (2016). 'Understanding and tackling societal grand challenges through management research'. *Academy of Management Journal*, **59**, 1880–95.

Gibson, C. B. and Birkinshaw, J. (2004). 'The antecedents, consequences, and mediating role of organizational ambidexterity'. *Academy of Management Journal*, **47**, 209–26.

Granstrand, O. (2005). 'Innovation and intellectual property rights'. In Fagerberg, J. and Mowery, D. C. (Eds), *The Oxford Handbook of Innovation*, 1st edition. Oxford: Oxford University Press, 266–90. https://doi.org/10.1093/oxfordhb/9780199286805.003.0010

GRI. (2021). *GRI Standard 101: Foundation*. Available at https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-english-language/ (accessed 16 September 2021).

Griggs, D., Stafford-Smith, M., Gaffney, O., Rockström, J., Öhman, M. C., Shyamsundar, P., Steffen, W., Glaser, G., Kanie, N. and Noble, I. (2013). 'Policy: Sustainable development goals for people and planet'. *Nature*, **495**, 305–07.

Grimes, M. G. and Vogus, T. J. (2021). 'Inconceivable! Possibilistic thinking and the sociocognitive underpinnings of entrepreneurial responses to grand challenges'. *Organization Theory*, **2**, 1–11.

Grinbaum, A. and Groves, C. (2013). 'What is "responsible" about responsible innovation? Understanding the ethical issues'. In Owen, R., Bessant, J. and Heintz, M. (Eds), *Responsible Innovation: Managing the Responsible Emergence of Science and Innovation in Society*. Chichester: Wiley, 119–42.

Gümüsay, A. A., Claus, L. and Amis, J. (2020). 'Engaging with grand challenges: An institutional logics perspective'. *Organization Theory*, **1**, 1–20.
Haack, P. and Scherer, A. G. (2014). 'Why sparing the rod does not spoil the child: A critique of the strict father model in transnational governance'. *Journal of Business Ethics*, **122**, 225–40.
Hart, S. L. (1995). 'A natural-resource-based view of the firm'. *Academy of Management Review*, **20**, 986–1014.
Hawn, O. and Kang, H.-G. (2018). 'The effect of market and nonmarket competition on firm and industry corporate social responsibility'. In Dorobantu, S., Aguilera, R. V., Luo, J. and Milliken, F. J. (Eds), *Sustainability, Stakeholder Governance, and Corporate Social Responsibility*. Bingley: Emerald Publishing Limited, **38**, 313–37.
Hopwood, B., Mellor, M. and O'Brien, G. (2005). 'Sustainable development: Mapping different approaches'. *Sustainable Development*, **13**, 38–52.
Howard-Grenville, J. (2021). 'Grand challenges, COVID-19 and the future of organizational scholarship'. *Journal of Management Studies*, **58**, 254–58.
Hudon, M. and Sandberg, J. (2013). 'The ethical crisis in microfinance: Issues, findings, and implications'. *Business Ethics Quarterly*, **23**, 561–89.
Islam, S. M. (2020). 'Unintended consequences of scaling social impact through ecosystem growth strategy in social enterprise and social entrepreneurship'. *Journal of Business Venturing Insights*, **13**, 1–6.
Jensen, M. C. (2002). 'Value maximization, stakeholder theory, and the corporate objective function'. *Business Ethics Quarterly*, **12**, 235–56.
Jones, T. M. (1995). 'Instrumental stakeholder theory: A synthesis of ethics and economics'. *Academy of Management Review*, **20**, 404–37.
Khavul, S. and Bruton, G. D. (2013). 'Harnessing innovation for change: Sustainability and poverty in developing countries'. *Journal of Management Studies*, **50**, 285–306.
Knight, F. H. (1921). *Risk, Uncertainty and Profit*. Boston, MA: Houghton Mifflin.
Lee, R. G. and Petts, J. (2013). 'Adaptive governance for responsible innovation'. In Owen, R., Bessant, J. and Heintz, M. (Eds), *Responsible Innovation: Managing the Responsible Emergence of Science and Innovation in Society*. Chichester: Wiley, 143–64.
Levillain, K. and Segrestin, B. (2019). 'From primacy to purpose commitment: How emerging profit-with-purpose corporations open new corporate governance avenues'. *European Management Journal*, **37**, 637–47.
Lidskog, R. and Elander, I. (2010). 'Addressing climate change democratically. Multi-level governance, transnational networks and governmental structures'. *Sustainable Development*, **18**, 32–41.
Lubberink, R., Blok, V., Van Ophem, J. and Omta, O. (2017). 'Lessons for responsible innovation in the business context: A systematic literature review of responsible, social and sustainable innovation practices'. *Sustainability*, **9**, 721.
Maak, T., Pless, N. M. and Voegtlin, C. (2016). 'Business statesman or shareholder advocate? CEO responsible leadership styles and the micro-foundations of political CSR'. *Journal of Management Studies*, **53**, 463–93.
Marti, E. and Scherer, A. G. (2016). 'Financial regulation and social welfare: The critical contribution of management theory'. *Academy of Management Review*, **41**, 298–323.
Maxmen, A. (2021). 'In shock move, US backs waiving patents on COVID vaccines'. *Nature*. Available at https://www.nature.com/articles/d41586-021-01224-3 (accessed 13 November 2021).
McWilliams, A. and Siegel, D. S. (2001). 'Corporate social responsibility: A theory of the firm perspective'. *Academy of Management Review*, **26**, 117–27.
McWilliams, A., Siegel, D. S. and Wright, P. M. (2006). 'Corporate social responsibility: Strategic implications'. *Journal of Management Studies*, **43**, 1–18.
Morduch, J. (2000). 'The microfinance schism'. *World Development*, **28**, 617–29.
Muff, K., Kapalka, A. and Dyllick, T. (2017). 'The Gap Frame – Translating the SDGs into relevant national grand challenges for strategic business opportunities'. *The International Journal of Management Education*, **15**, 363–83.
Murray-Webster, R. and Simon, P. (2006). 'Making sense of stakeholder mapping'. *PM World Today*, **8**, 1–4.
Muzio, D. and Doh, J. P. (2020). 'COVID-19 and the future of management studies. Insights from leading scholars'. *Journal of Management Studies*, **57**, 1725–26.
Nilsson, A. (2017). 'Making norms to tackle global challenges: The role of Intergovernmental Organisations'. *Research Policy*, **46**, 171–81.
Nilsson, M. and Persson, A. (2012). 'Can Earth system interactions be governed? Governance functions for linking climate change mitigation with land use, freshwater and biodiversity protection'. *Ecological Economics*, **75**, 61–71.

Nohria, N. (2020). 'What organizations need to survive a pandemic'. *Harvard Business Review*. Available at https://hbr.org/2020/01/what-organizations-need-to-survive-a-pandemic (accessed 13 November 2021).
Novitzky, P., Bernstein, M. J., Blok, V., Braun, R., Chan, T. T., Lamers, W., Loeber, A., Meijer, I., Lindner, R. and Griessler, E. (2020). 'Improve alignment of research policy and societal values'. *Science*, **369**, 39–41.
OCC. (2021). *Responsible Innovation*. Available at https://www.occ.treas.gov/topics/responsible-innovation/index-innovation.html (accessed 11 August 2021).
Ostrom, E. (2010). 'Polycentric systems for coping with collective action and global environmental change'. *Global Environmental Change*, **20**, 550–57.
Owen, R., Bessant, J. and Heintz, M. (2013). *Responsible Innovation: Managing the Responsible Emergence of Science and Innovation in Society*. Chichester: Wiley.
Owen, R. and Goldberg, N. (2010). 'Responsible innovation: A pilot study with the U.K. engineering and physical sciences research council'. *Risk Analysis: An International Journal*, **30**, 1699–707.
Owen, R., Macnaghten, P. and Stilgoe, J. (2012). 'Responsible research and innovation: From science in society to science for society, with society'. *Science and Public Policy*, **39**, 751–60.
Owen, R., Pansera, M., Macnaghten, P. and Randles, S. (2021). 'Organisational institutionalisation of responsible innovation'. *Research Policy*, **50**, 104132.
Perrini, F., Costanzo, L. A. and Karatas-Ozkan, M. (2020). 'Measuring impact and creating change: A comparison of the main methods for social enterprises'. *Corporate Governance: The International Journal of Business in Society*, **21**, 237–51.
Phillips, W., Lee, H., Ghobadian, A., O'Regan, N. and James, P. (2015). 'Social innovation and social entrepreneurship: A systematic review'. *Group & Organization Management*, **40**, 428–61.
Pless, N. M., Maak, T. and Waldman, D. A. (2012). 'Different approaches toward doing the right thing: Mapping the responsibility orientations of leaders'. *Academy of Management Perspectives*, **26**, 51–65.
Porter, M. E. and Kramer, M. R. (2006). 'Strategy & society: The link between competitive advantage and corporate social responsibility'. *Harvard Business Review*, **84**, 78–92.
Rasche, A., Morsing, M. and Moon, J. (2017). *Corporate Social Responsibility: Strategy, Communication, Governance*. Cambridge: Cambridge University Press.
Rasche, A., Waddock, S. and Mcintosh, M. (2013). 'The United Nations global compact: Retrospect and prospect'. *Business & Society*, **52**, 6–30.
Rauch, M. and Ansari, S. (2021). 'From "publish or perish" to societal impact: Organizational repurposing towards responsible innovation through creating a medical platform'. *Journal of Management Studies*. https://doi.org/10.1111/joms.12737
Reynolds, M. and Yuthas, K. (2008). 'Moral discourse and corporate social responsibility reporting'. *Journal of Business Ethics*, **78**, 47–64.
Ries, E. (2011). *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. New York: Crown.
SASB. (2021). *SASB Materiality Map*. Available at https://materiality.sasb.org/ (accessed 16 September 2021).
Scherer, A. G., Baumann-Pauly, D. and Schneider, A. (2013). 'Democratizing corporate governance: Compensating for the democratic deficit of corporate political activity and corporate citizenship'. *Business & Society*, **52**, 473–514.
Scherer, A. G. and Palazzo, G. (2011). 'The new political role of business in a globalized world: A review of a new perspective on CSR and its implications for the firm, governance, and democracy'. *Journal of Management Studies*, **48**, 899–931.
Scherer, A. G. and Voegtlin, C. (2020). 'Corporate governance for responsible innovation: Approaches to corporate governance and their implications for sustainable development'. *Academy of Management Perspectives*, **34**, 182–208.
Schneider, A., Wickert, C. and Marti, E. (2017). 'Reducing complexity by creating complexity: A systems theory perspective on how organizations respond to their environments'. *Journal of Management Studies*, **54**, 182–208.
Schreyögg, G. and Steinmann, H. (1987). 'Strategic control: A new perspective'. *Academy of Management Review*, **12**, 91–103.
See, G. (2009). 'Harmonious society and Chinese CSR: Is there really a link?'. *Journal of Business Ethics*, **89**, 1–22.
Senge, P. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization*. New York: Doubleday.
Serafeim, G. (2020). 'Social-impact efforts that create real value'. *Harvard Business Review*, **98**, 37–48.
Shepherd, D. A. and Gruber, M. (2021). 'The lean startup framework: Closing the academic–practitioner divide'. *Entrepreneurship Theory and Practice*, **45**, 967–98.

Siegel, D. S. (2009). 'Green management matters only if it yields more green: An economic/strategic perspective'. *Academy of Management Perspectives*, **23**, 5–16.
Simons, R. (1995). *Levers of Control*. Boston, MA: Harvard Business School Press.
Stahl, G. K. and Sully de Luque, M. (2014). 'Antecedents of responsible leader behavior: A research synthesis, conceptual framework, and agenda for future research'. *Academy of Management Perspectives*, **28**, 235–54.
Stahl, G. K., Sully De Luque, M. and Miska, C. (2022). 'Culture and corporate social responsibility'. In Gelfand, M. and Erez, M. (Eds), *The Oxford Handbook of Culture and Organizations*. Oxford: Oxford University Press, forthcoming.
Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., Biggs, R., Carpenter, S. R., de Vries, W., de Wit, C. A., Folke, C., Gerten, D., Heinke, J., Mace, G. M., Persson, L. M., Ramanathan, V., Reyers, B. and Sörlin, S. (2015). 'Planetary boundaries: Guiding human development on a changing planet'. *Science*, **347**, 1259855.
Stilgoe, J., Owen, R. and Macnaghten, P. (2013). 'Developing a framework for responsible innovation'. *Research Policy*, **42**, 1568–80.
Tang, Z., Hull, C. E. and Rothenberg, S. (2012). 'How corporate social responsibility engagement strategy moderates the CSR–financial performance relationship'. *Journal of Management Studies*, **49**, 1274–303.
Ternes, K., Iyengar, V., Lavretsky, H., Dawson, W. D., Booi, L., Ibanez, A., Vahia, I., Reynolds, C., DeKosky, S., Cummings, J., Miller, B., Perissinotto, C., Kaye, J. and Eyre, H. A. (2020). 'Brain health Innovation Diplomacy: A model binding diverse disciplines to manage the promise and perils of technological innovation'. *International Psychogeriatrics*, **32**, 955–79.
United Nations (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development*. Resolution adopted by the General Assembly on 25 September 2015. A/RES/70/1. New York: United Nations General Assembly, 1–35.
Vaccaro, A. and Palazzo, G. (2015). 'Values against violence: Institutional change in societies dominated by organized crime'. *Academy of Management Journal*, **58**, 1075–101.
Van Den Hove, S. (2006). 'Between consensus and compromise: Acknowledging the negotiation dimension in participatory approaches'. *Land Use Policy*, **23**, 10–17.
van Wijk, J., Zietsma, C., Dorado, S., de Bakker, F. G. A. and Martí, I. (2019). 'Social innovation: Integrating micro, meso, and macro level insights from institutional theory'. *Business & Society*, **58**, 887–918.
Voegtlin, C. (2016). 'What does it mean to be responsible? Addressing the missing responsibility dimension in ethical leadership research'. *Leadership*, **12**, 581–608.
Voegtlin, C. and Scherer, A. G. (2017). 'Responsible innovation and the innovation of responsibility: Governing sustainable development in a globalized world'. *Journal of Business Ethics*, **143**, 227–43.
Voegtlin, C. and Scherer, A. G. (2019). 'New roles for business: Responsible innovators for a sustainable future'. In McWilliams, A., Rupp, D., Siegel, D., Stahl, G. and Waldman, D. (Eds), *The Oxford Handbook of Corporate Social Responsibility: Psychological and Organizational Perspectives*. Oxford: Oxford University Press Oxford, 337–58.
Vogel, D. J. (2005). 'Is there a market for virtue?: The business case for corporate social responsibility'. *California Management Review*, **47**, 19–45.
von Hippel, E. (2005). *Democratizing Innovation*. Cambridge, MA: MIT Press.
von Hippel, E. and von Krogh, G. (2003). 'Open source software and the "private-collective" innovation model: Issues for organization science'. *Organization Science*, **14**, 209–23.
von Schomberg, R. (2011). 'Prospects for technology assessment in a framework ofresponsible research and innovation'. In Dusseldorp, M. and Beecroft, R. (Eds), *Technikfolgen Abschätzen Lehren: Bildungspotenziale transdisziplinärer Methoden*. Wiesbaden: Springer, 39–62.
von Schomberg, R. and Hankins, J. (2019). *International Handbook on Responsible Innovation: A Global Resource*. Cheltenham: Edward Elgar Publishing.
Waldron, T. L., Navis, C., Karam, E. P. and Markman, G. D. (2020). 'Toward a theory of activist-driven responsible innovation: How activists pressure firms to adopt more responsible practices'. *Journal of Management Studies*. https://doi.org/10.1111/joms.12548
Whiteman, G., Walker, B. and Perego, P. (2013). 'Planetary boundaries: Ecological foundations for corporate sustainability'. *Journal of Management Studies*, **50**, 307–36.
Wickert, C. and Risi, D. (2019). *Corporate Social Responsibility*. Cambridge: Cambridge University Press.
Wilson, H. and Hopewell, A. (2018). 'Buy one, give one: What TOMS shoes tells us about the West's urge to help Africa'. *The Urge To Help*. Available at https://theurgetohelp.com/articles/buy-one-give-one-what-toms-shoes-tells-us-about-the-wests-urge-to-help-africa/ (accessed 29 September 2021).
Zuboff, S. (2019). *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. London: Profile Books.