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A R T I C L E

CORPORATE FORESIGHT: A NEW FRONTIER FOR STRATEGY AND MANAGEMENT

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This article introduces the construct of corporate foresight to a strategy and management scholars' audience. Corporate foresight is a dynamic, firm-level capability that allows firms to evaluate future scenarios of the business environment, including systematic doomsday collapses. Corporate foresight is defined, situated in the broader epistemological underpinnings of futures studies, theoretically inscribed in the dynamic capabilities' framework, distinguished from related constructs, and deconstructed in its main components. Its main antecedents and outcomes are elaborated, and further research directions are discussed. It is argued that corporate foresight is of fundamental relevance to strategy and management scholarship due to four reasons: (a) corporate foresight can integrate with, enrich, and expand the dynamic capabilities framework by considering an additional, underinvestigated, future-oriented firm capability; (b) the emergence of corporate foresight is an organizational phenomenon, closely aligned with the contingency theory of the firm; (c) corporate foresight can favorably affect important organizational outcomes including learning, creativity, innovation, and performance via a mechanism to create competitive advantage that has not been previously explored by strategy and management scholarship; and (d) further investigating corporate foresight from a strategy and management point of view opens a rich research agenda.

Environmental instability is an increasing concern for firms around the globe. Disruptive and unforeseeable political events, economic downturns, pandemics, along with the interrelated consequences of quick technological, demographical, and social shifts constitute managerial challenges on multiple fronts. Executives at the highest corporate and public levels have relayed their struggle to foresee several recent digital and geopolitical dynamics (Gowing & Langdon, 2015). The rate of technological change and innovation speed have increased, products' lifecycles have shortened, innovation diffusion has quickened (Rohrbeck, 2010: 2), and VUCA—an acronym for volatility, uncertainty, complexity, and ambiguity—has become a common term to describe the environment in which firms operate (Bennet & Lemoine, 2014a, 2014b)[1]

A rapidly changing VUCA environment decreases executives' confidence in the effectiveness of planning (Bennet & Lemoine, 2014b), creating challenges for restructuring, designing innovation, orchestrating partnerships, and managing human resources (Millar, Groth, & Mahon, 2018). It also makes the impending risk of environmental systemic collapse, or doomsday, more apparent. Therefore, it has been suggested that business decisions should not only be based on past data, but also on the systematic evaluation of possible futures (Martin & Golsby-Smith, 2017; Oliver & Parrett, 2018)—that is, a range of significantly different future scenarios of the business environment—and that procedures to systematically detect "irrational" future scenarios by means of constant scanning for discontinuities in the business

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[1] Recently also reframed as TUNA—that is, turbulence, uncertainty, novelty, and ambiguity (Ramírez & Wilkinson, 2018).

environment are necessary for survival (Day & Schoemaker, 2005).

Indeed, to deal with a VUCA environment, firms have developed *foresight*—the capability to systematically use heuristic processes to scan for environmental trends and discontinuities, and design and evaluate several possible future outcomes of those trends and discontinuities (Bereznoy, 2017; Rohrbeck, Battistella, & Huizingh, 2015; Vecchiato, 2012a, 2012b, 2015a, 2015b). These processes can be used in various settings, including governmental and military contexts, but when applied in organizational settings are referred to as *corporate foresight*[2] (Kononiuk & Sacio-Szymanska, 2015; Rohrbeck & Bade, 2012). The extent to which firms develop corporate foresight determines their likelihood of having grown more prepared to (not of having predicted) looming doomsday or collapse scenarios, among several other possible futures.

Corporate foresight techniques, such as scenario planning, Delphi surveys, and technology roadmapping, have been used extensively in the past few decades by several globally leading firms spanning industries including information technology, energy, automotive and communication (Vecchiato, 2012a, 2012b, 2015a, 2015b). Yet it is only recently, and perhaps in part due to several unpredictable economic and political phenomena across the globe, that there has been an increased growth of interest by academics and practitioners in corporate foresight (Amer, Daim, & Jetter, 2012; Daheim & Uerz, 2008; Fergnani, 2019a; Hines & Gold, 2015; Iden, Methlie, & Christensen, 2017; Rigby & Bilodeau, 2007; Rohrbeck & Bade, 2012; Rohrbeck et al., 2015; Schwarz, 2008). This suggests that corporate foresight, as an emerging and distinct firm capability, is an organizational phenomenon closely related to strategic decision-making, and thus, that deserves close scrutiny by strategy and management scholarships.

However, and unfortunately, the corporate foresight literature has developed in relative isolation from the strategy and management literatures (Chermack, 2018; Rohrbeck et al., 2015). Corporate foresight research has been primarily published in journals concerned with futures studies and foresight, such as *Technological Forecasting and Social Change, Futures, Technology Analysis & Strategic Management,* and *Long Range Planning* (Iden et al., 2017). On the other hand, the strategy and management literatures, although having recently recognized the role of uncertainty in framing management theories and called for further efforts in this direction (Alvarez, Afuah, & Gibson, 2018), have been slower to integrate and explain organizational phenomena that are closely related to environmental instability, such as corporate foresight. Specifically, in the field of strategy and management, the few attempts to model the way organizations develop processes and capabilities to detect environmental changes and prepare for the future (e.g. Daft & Weick, 1984; Day & Schoemaker, 2004, 2005; Gavetti & Menon, 2016; Hambrick, 1981) have been limited or incomplete. Most notably, they have disregarded the large body of futures studies and foresight literature on corporate foresight.

This is a lost opportunity for two reasons. First, it is a lost opportunity for strategy and management scholars. Indeed, a recent systematic literature review has uncovered a lack of theoretical foundations in corporate foresight scholarship (Iden et al., 2017), showing that there is ample room for better explanations of this increasingly salient organizational phenomenon. Second, it is a lost opportunity for practitioners, as the dearth of strategy and management scholarship's attention to corporate foresight has prevented it from having strong theoretical underpinnings and the rigor of analysis from which practitioners would benefit.

In view of this, the present article introduces corporate foresight to management and organizations and strategic management scholars who may have considered incorporating this construct into their research but are not well-aware of the futures studies and foresight literature in this field of inquiry. The article argues that this construct is fundamental for studying how firms react to an unstable environment subject to the systematic risk of sudden change, or even of doomsday collapse. Thus, it cannot be further ignored by strategy and management scholarship. The position of this article is developed following four related arguments. First, based on recent empirical evidence and operational convenience, it is suggested that corporate foresight can be considered a dynamic capability of the firm. As such, the construct of corporate foresight can

[2] Research in this area has been referred to in several ways. Rohrbeck and Bade (2012) noted that the terms "environmental scanning," "peripheral vision," and "futures research" were used in the 1980s and 1990s, and that the terms "strategic foresight" or "corporate foresight" have been more commonly used only since the early 2000s (Rohrbeck & Bade, 2012), although the terms "organizational foresight" and "business foresight" are sometimes also used (Kononiuk & Sacio-Szymanska, 2015).

integrate with, enrich, and expand the dynamic capabilities framework by including an additional, underinvestigated, future-oriented firm capability. Second, because corporate foresight emerges due to contingencies of an unstable environment, a mechanism that can be moderated by firm-level orientations, its origins are organizational phenomena relevant to strategy and management scholarship and aligned with the contingency theory of the firm. Third, the futures studies and foresight literature has suggested that corporate foresight can favorably affect important organizational outcomes, including learning, creativity, innovation, and performance, via a mechanism to create competitive advantage that has not been previously explored by strategy and management scholarship. Lastly, investigating corporate foresight from a strategy and management point of view opens a rich research agenda in an emerging but nondiscountable organizational phenomenon. This concurrently responds to the call by Alvarez, Afuah, and Gibson (2018) for more research concerned with environmental uncertainty and to the call by Corley and Gioia (2011) for more anticipatory and future-relevant management inquiry.

The manuscript is organized as follows. The first section sets the stage by defining the construct of corporate foresight capability, by explaining its underlying epistemological roots, by situating its theoretical underpinnings in the resource-based view of the firm and in the later expansion of this framework with the notion of dynamic capabilities, and by identifying its different components. The second and third sections draw from the futures studies, foresight, and strategic management literatures to identify and elaborate on the antecedents and outcomes, respectively, of corporate foresight capability. The fourth section discusses future research directions that could emerge from the inclusion of this construct in a strategy and management research agenda and provides methodological recommendations for undertaking research on corporate foresight.

ARGUMENT 1: ON CORPORATE FORESIGHT AS A DYNAMIC CAPABILITY

Definition of Corporate Foresight

Although several definitions of corporate foresight have been provided (see Rohrbeck et al., 2015), we can define corporate foresight by integrating the most salient aspects of foresight in organizational contexts, as *a systematic organization-level dynamic capability to interpret changes in the environment, outline and evaluate possible futures based on these changes, and use information from these futures for the organization's competitive advantage.*

This definition incorporates the most salient aspects of foresight that have been neglected by strategy and management scholarship: the notion that corporate foresight involves the firm at large rather than a few upper-management strategists (Ahlqvist & Kohl, 2016; Sarpong & Maclean, 2011, 2016; Sarpong, Mclean, & Alexander, 2013), the notion that it involves not only scanning but also creating possible futures (Vecchiato, 2012a), and its inscription in the dynamic capabilities framework, which is one contribution of this article.

Corporate foresight is defined as an organizational capability for two reasons. The first is evidence-based. Indeed, corporate foresight evolved from a set of activities seldom applied in organizational settings into a distinct and ongoing corporate capability over time (Rohrbeck et al., 2015). Specifically, foresight was initially developed in the 1950s by pioneering figures such as Gaston Berger, associated with the French school *La Prospective,* who emphasized systems thinking; and by Herman Khan at the U.S.-based RAND Corporation, who developed the Delphi method. It evolved in the 1960s and 1970s thanks to the development of organizational scenario planning methods at Royal Dutch Shell and their later proliferation in the broader corporate world. Its scope widened in the 1980s and 1990s, when new tools, such as roadmaps, were applied in the telecommunication and automotive sectors to inform not only strategy but also innovation. Finally, since the early 2000s the increase of firms' awareness of its importance has been driving its integration with corporate planning (Rohrbeck et al., 2015). Therefore, more recently, corporate foresight's more widespread usage and integration speak of more systematic and long-lasting organizational practices and routines, different from isolated, and often outsourced, foresight exercises such as scenario planning, forecasting, Delphi, gaming, or causal layered analysis sessions. This is also evident from a recent bibliometric analysis showing that scientific research on corporate foresight has tended to feature agency-related terms, such as *ability*, *reflection,* and *evaluation* (Kononiuk & Sacio-Szymanska, 2015). Indeed, recent works have shed light on early studies showing that the amount of environmental scanning does not vary across executives' hierarchical levels (Aguilar, 1967; Hambrick, 1981) by highlighting the continuous and dynamic aspect of corporate foresight. It has been suggested that corporate foresight is a strategic

intelligence capability embedded in the firm, rather than an episodic or externally brokered phenomenon (Ahlqvist & Kohl, 2016; Sarpong et al., 2013). It is a social and ongoing everyday practice (Sarpong & Maclean, 2011, 2016), a series of micro activities aimed at negotiating an organizational path toward the future (Sarpong et al., 2013). It involves constant interaction among members of an organization, not limited to the upper echelons, and facilitated when employees are encouraged to share their viewpoints on emerging environmental change and visions for strategic change (Sarpong & Maclean, 2016).

The second reason is operational. Indeed, corporate foresight has been defined both as a set of activities—that is, the specific tools and techniques used in corporate foresight exercises—and as a set of firm-level capabilities, so that, in the futures studies and foresight literature, there is still no complete consensus on its conceptualization (Jissink, Rohrbeck, & Huizingh, 2014; Rohrbeck, 2010). However, it seems that the conceptualization of corporate foresight as an activity (or activities) has won the majority of scholarship as futures studies and foresight scholars have primarily studied the effects of corporate foresight on organizational outcomes with quasi-experiments or *ad hoc* case studies. This constitutes an untapped opportunity for strategy and management scholars who, by measuring corporate foresight as a *capability*, could apply rigorous regression analyses to generate sophisticated models of its antecedents and consequences, thereby benefiting its deeper investigation.

Indeed, conceptualizing corporate foresight as an activity (or activities) means losing sophistication on the ground that foresight activities can be distinguished between two main kinds: those meant to detect trends and discontinuities in the environment, such as environmental scanning; and those meant to plot how those trends and discontinuities can change in different ways in different possible futures, such as scenario planning (Vecchiato, 2012a). As foresight in organizational settings usually involves the combination of both, which are difficult to decouple, a capability-based conceptualization allows scholars to create multidimensional measures that can take into account and distinguish the capability originated from both kinds of activities as predictors. Indeed, a recent attempt to operationalize scenario planning, for instance, showed that this is a multidimensional construct, featuring items related to scanning and information acquisition, along with items related to narrative scenarios development (Bouhalleb & Smida, 2018).

Epistemological Underpinnings

Corporate foresight epistemological underpinnings are rooted in the larger discipline of the study of the futures—that is, *futures studies* (Fergnani, 2019a). Futures studies, often also referred to as *futures research*, or shortened as *futures*, consists of systematic inquiry aimed at discovering, inventing, examining, and evaluating possible, probable, and preferable futures (Bell, 1997). When applied by practitioners, this field of inquiry is often referred to as *foresight*, although the two terms can be used as synonyms. Perhaps the most foundational assumption of futures studies is that the future is not predetermined so there is no future to be predicted (Dator, 1998; Voros, 2007). Rather, several futures are possible and can be studied. This is done by collecting "images of the futures" in the present from a variety of sources (Dator, 1998; Voros, 2007) to benefit current actions and decision-making (Voros, 2007).

Moreover, futures studies draws epistemological foundations from many schools of thought (Voros, 2007). From post-positivism, it draws the idea of rigorously conducting and assessing foresight practices (Kuusi, Kuhls, & Steinmuller, 2015). From critical theory and constructivism, it draws the idea that the future should be questioned (Inayatullah, 2002, 2013; Voros, 2007), and socially constructed through dialogue (Voros, 2007). From post-structuralism, it draws the idea that the future should be "deepened" and deconstructed into several levels of knowledge (Inayatullah, 1998, 2002; Voros, 2005). From participatory scholarship, it draws the idea that the future should be shaped or designed by anticipatory actions by involving a variety of stakeholders (Bell, 1997; Voros, 2007). Futures studies is therefore a highly cross-disciplinary field of inquiry (Dator, 1998), which embraces complexity rather than reductionism (Inayatullah, 2002).

Therefore, in the spirit of futures studies, corporate foresight does not aim to predict the future where the organization will operate, but rather to create organizational futures through present choices matured through foresight practices (Jissink et al., 2014; Vecchiato, 2012b, 2015a, 2015b). These practices are participatory (Wright & Goodwin, 2009) and attuned to involving a variety of interests in the futures-creation process, including those of different cultures and future generations (Inayatullah, 2002). This is substantiated by the recent interest in including multiple stakeholders' viewpoints in organizational scenario-planning exercises (Cairns, Sliwa, & Wright, 2010; Cairns & Wright, 2018a, 2018b).

Also in the spirit of futures studies, corporate foresight rests on the assumption that prediction may be reliable in the short-term future, but not in the long-term future, whereby several economic, technological, political, and social trends interact in unpredictable ways (Vecchiato, 2012b, 2015a). Hamel and Prahalad (1994) explained that foresight is a long-term, "outward"-oriented capability, consisting in the constant monitoring for discontinuities and trends in the environment, in sharp contrast with more "inward"-oriented strategic procedures, such as restructuring and downsizing, that can help a firm survive in the short-term but do not necessarily translate into long-term success.

In view of the above, the epistemology behind futures studies and corporate foresight is different from traditional corporate planning in various aspects. The former is concerned with a longer time horizon (usually between 5 to 50 years ahead into the future), emphasizes the substantive qualitative difference between the possible futures envisioned, is committed to taking into consideration different ways of thinking and knowing about the future, emphasizes the possibility of creating and shaping a preferable future among many possible futures, and is relatively more participatory—that is, involves a wider set of stakeholders in the anticipation process (Inayatullah, 2013).

Planners, on the other hand, are relatively more concerned with the short-term future, which they consider determined and predictable using single point estimates (Porter, 1985b), and often according to the sole point of view of the upper management. When analyzing plural future scenarios, planners usually consider similar outcomes of the same trend—that is, small variations in a mathematical model (Inayatullah, 2013); contingency planning, which addresses uncertainty less comprehensively than scenarios produced through foresight (Porter, 1985a); or probabilistic decision trees, which quantitatively decompose future strategies into probabilities without taking the future complexity of the outer environment into full account (Goodwin & Wright, 2014a). These differences are summarized in Table 1.

However, corporate foresight has parallelisms with planning. Indeed, it is situated halfway between the planning, or "design," and the learning, or "adaptive," schools—the two main currents of thought in strategic decision-making—and integrates aspects of both (Bereznoy, 2017; Vecchiato, 2012a). With the former, arguing that strategy should be based on a rational process of trend monitoring, forecasting, and integration of forecasts into the firms' strategy (Ansoff, 1991; Porter, 1985b), it shares the objective of proactively creating the best possible strategy to cope with uncertainty through a systematic analytical process. With the latter, arguing that strategy should emerge over time through continuous experimentation and adaptation (Mintzberg, 1990; Quinn, 1980), it shares the belief that the future cannot be predicted, but it is possible to grow more prepared for it.

Theoretical Underpinnings and Distinction from Related Constructs

The theoretical underpinnings of the construct of corporate foresight can be situated in the resource-based view of the firm and in the later expansion of this view with the dynamic capabilities framework. The resource-based view emerged in the 1980s, when Wernerfelt (1984) emphasized the importance of firm resources, including assets or practices, to achieve competitive advantage. It was later refined by Barney (1991), who explained that the necessary attributes of relevant firm resources are value, rarity, inimitability, and nonsubstitutability. Corporate foresight can be identified as one of these resources. Indeed, Rohrbeck (2010: 50) explained that corporate foresight has competitive relevance as it has all four of the above attributes.

However, following the later enhancement of the resource-based view with the dynamic capabilities framework (Teece, Pisano, & Shuen, 1997), corporate foresight is better conceptualized as a dynamic capability. This framework maintains that due to rapidly changing business environments firms cannot achieve competitive advantage with resources alone, but only by having dynamic capabilities—that is, organizational abilities to reconfigure and recreate resources and competences to quickly adapt to the business environment (Teece et al., 1997; Wang & Ahmed, 2007).

In particular, corporate foresight is a dynamic capability that allows a firm to achieve adaptation via sustained future preparedness, matured over time and through repeated exposure and practice of foresight methods in corporate settings. As such, the construct of corporate foresight capability is theoretically situated in the dynamic capabilities framework, emphasizing the importance of everchanging dynamic capabilities of the firm to attain competitive advantage and survival (Wang & Ahmed, 2007).

The conceptualization of corporate foresight as a dynamic capability fits well into the description of

TABLE 1
Differences between Corporate Planning and Corporate Foresight

	Corporate Planning	Corporate Foresight
Epistemology	The future is predetermined and predictable	The future is open to possibilities and can be shaped
Outcome	Single point estimate	Complex scenarios
Time horizon	Short-term future (1–5 years)	Long-term future (5–50 years)
Involvement	Upper management	Participatory
Prioritized interests	Interest of shareholders	Interests of a variety of stakeholders
Methodology	Variation in mathematical models, contingency planning, decision trees	Scenario planning, roadmaps, Delphi surveys, backcasting, causal layered analysis, etc.

the microfoundations of dynamic capabilities provided by Teece (2007). Therein, Teece disaggregated dynamic capabilities into three components: sensing, or the capacity to systematically monitor and detect incipient or latent market needs and technological shifts; seizing, or the capacity to hone and change business models according to the findings of the sensing activity; and transforming, or the capacity to reinvest resources into reconfiguration to maintain sustained competitive advantage. Corporate foresight presents clear elements of all of the above, while at the same time being a distinct capability for its focus on the evaluation of multiple futures.

Indeed, it has to be acknowledged that the construct of corporate foresight capability, while being novel, overlaps with and presents similar elements of previously investigated dynamic capabilities of the firm. These include adaptive capability, or the ability to "identify and capitalize emerging market opportunities" (Wang & Ahmed, 2007: 37); absorptive capacity, or the ability to recognize, assimilate, and use external information (Lane, Koka, & Pathak, 2006; Wang & Ahmed, 2007); innovative capability, or the ability to develop new products and processes (Wang & Ahmed, 2007); and relational capability (Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, & Winter, 2007), or the ability to reconfigure the resource base of the firm by including resources of collaborators and acquisitions. However, the key difference between these capabilities and corporate foresight is that they are primarily focused on the present, while corporate foresight has a clear and systematic orientation toward the futures. Specifically, corporate foresight is distinctly based on the constant scanning for trends and discontinuities that could lead to different futures of the business environment and on the evaluation of these multiple futures prior to decision-making, which is an explicit and structured practice to be distinguished from strategists' unsophisticated subconscious evaluations of future scenarios.

For the same reason, corporate foresight is also distinct from, while overlapping with, strategic decision-making. Indeed, it is an input to decision-making (Jissink et al., 2014; Stokke, Raltson, Boyce, & Wilson, 1990), and can be considered as complementary to it (Godet, 1990). It enriches it and informs it with insightful information on possible futures of the business environment while shaping and contributing to it. This relationship can be visualized in Figure 1, where a Venn diagram shows the two constructs overlapping but not coinciding, where the corporate foresight circle is represented as an input to decision-making, and where the dotted line of the decision-making circle represents its expansion and change due to the influence of corporate foresight.

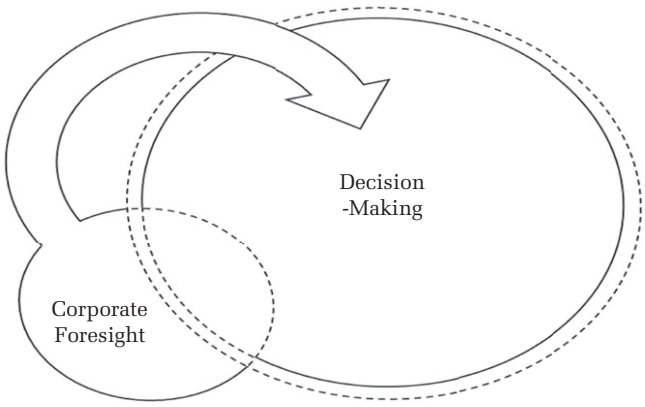
As a dynamic capability, corporate foresight should therefore be considered by strategy and management scholarship as a salient phenomenon driving firm-level outcomes, and further researched as an additional, underinvestigated, future-oriented firm capability.

The Components of Corporate Foresight

As a dynamic capability, corporate foresight can be considered as (a) the extent of sophistication in all the components of systematic and repeated foresight activities in organizations, and (b) the extent to which a firm can reconfigure these components with the aim to achieve competitive advantage and survival in an unstable environment. As it is important to identify the different dimensions that constitute corporate foresight for further theoretical development and empirical measurement purposes, this section explains these components.

Measurement frameworks to empirically assess the level of foresight in organizations have been put

FIGURE 1
The Relationship between Corporate Foresight and Decision-Making



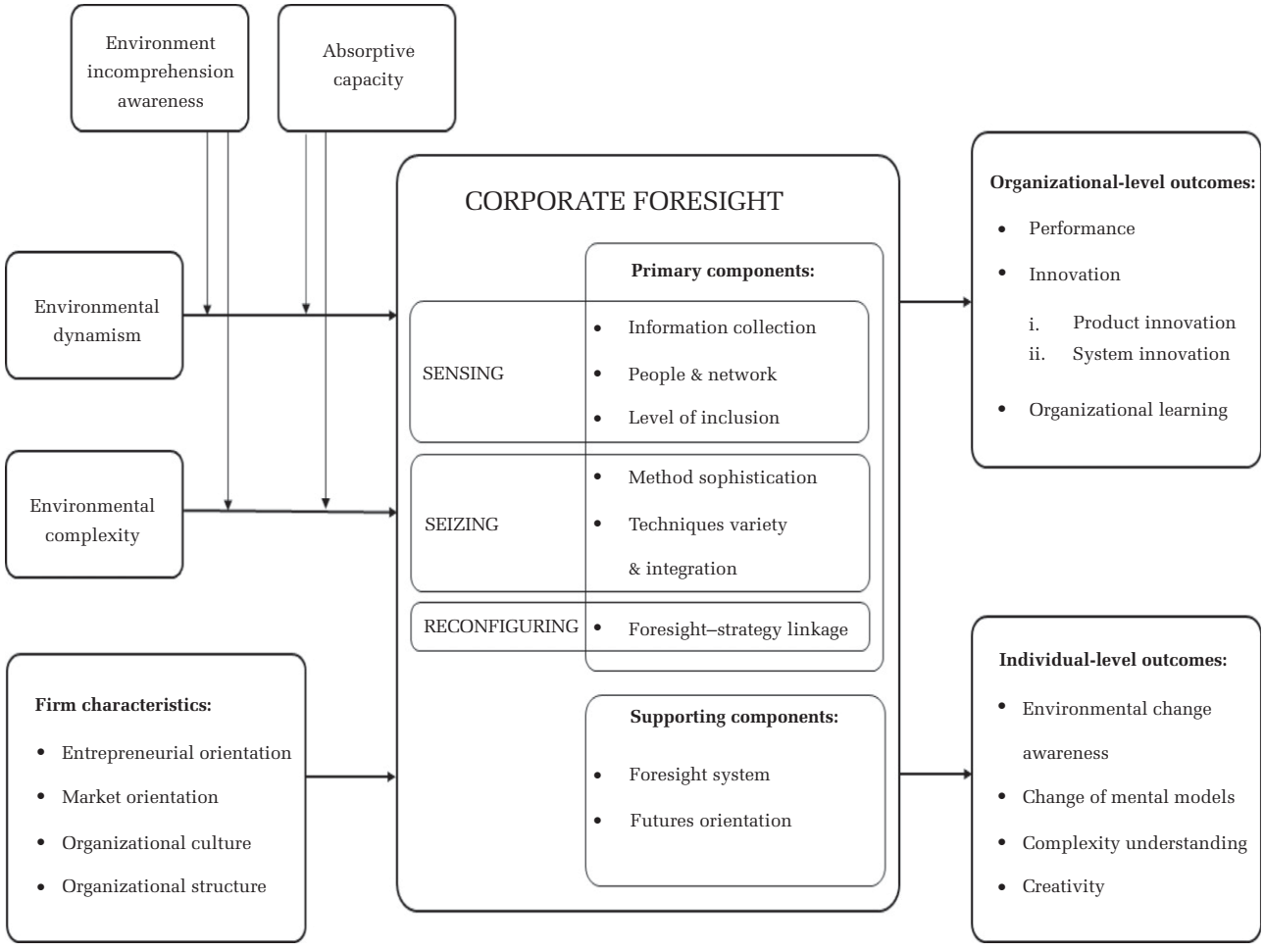
forward by Grim (2009), Rohrbeck (2010), Jissink et al. (2014), and Schreiber (2019). Among these, Rohrbeck's framework is perhaps the most detailed as it identifies several foresight capability components, while both Grim and Schreiber only distinguished levels of proficiency, which lend less well to empirical testing. In particular, Rohrbeck's framework deconstructs corporate foresight into five components: *information usage, method sophistication, people and network, organization,* and *culture*. However, several components of this framework are either not comprehensive, confusional, overlapping with other components, or overlapping with corporate foresight's potential antecedents and outcomes (e.g. culture and organization). This article therefore clarifies and expands the work of the above authors with a more sophisticated eight-components framework, made up of six primary components and two supporting components: *information collection*; *people and network*; *level of inclusion*; *method sophistication*; *techniques variety and integration*; *foresight-strategy linkage*; *foresight system*; and *futures orientation*. Each component is explained in more detail below. This new framework also inscribes corporate foresight into the microfoundations of dynamic capabilities (Teece, 2007) by linking the primary corporate foresight components with the three foundational tenets of dynamic capabilities—that is, sensing, seizing and reconfiguring. The eight components are represented graphically in the center of Figure 2.

Information collection. Information collection refers to the level of breadth and depth of information that the firm collects when scanning environmental discontinuities and trends (Rohrbeck, 2010). Indeed, the proficiency in activities aimed at identifying the building blocks of more complex anticipation techniques such as scenario planning has been unequivocally mentioned by corporate foresight practitioners and researchers of different currents of thought (Chermack, 2011; Miles, Saritas, & Sokolov, 2016; Schwartz, 1996; Wade, 2012; Webb, 2016), although it has been referred to in different ways, such as environmental scanning, literature reviews, and bibliometric techniques (for trends); horizon scanning and emergent issues analysis (for discontinuities); or looking at the fringes (for both). For its importance in detecting a wide range of external signals, this is a *sensing* component of corporate foresight capability.

People and network. People and network refers to the quality of the human resources employed in the foresight procedures and to the level of connection to and within them (Rohrbeck, 2010). Not only do foresight practitioners in the organization need to be knowledgeable regarding foresight and receptive to environmental changes, but they also need to leverage external stakeholders. Indeed, as corporate foresight is a participatory process, it is not uncommon, and often advised, that firms systematically involve external and varied stakeholders or minorities to contribute to corporate foresight and to counter the viewpoints of organizational members by acting as devil's advocates (Wright & Goodwin, 2009: Wade, 2012). In general, the more qualified and varied the foresight human resources and the more developed the network that can leverage human talent in and outside the organization, then, the more likely are corporate foresight practices to detect weak and counterintuitive environmental signals. These will challenge current decision-makers' mental models about the future, thereby benefiting the firm's foresight output. For its importance in using human talent to detect counterintuitive external signals, this is a *sensing* component of corporate foresight capability.

Level of inclusion. As foresight is a participatory (Wright & Goodwin, 2009) and organizational-level (Sarpong & Maclean, 2011, 2016; Sarpong et al., 2013) capability that is stronger when more diverse human resources are employed and given voice, and weaker when it is limited to the upper management, it follows that the level of inclusion of different individuals at different levels of the organization in the formulation of foresight processes, or, in other words, the level of decentralization of foresight, is a key feature of foresight capability. For its importance in involving the organization at large to detect a wide

FIGURE 2
Model of Corporate Foresight Components, Antecedents, and Outcomes



range of external signals, this is a *sensing* component of corporate foresight capability.

Method sophistication. Method sophistication refers to the extent to which a firm can systematically interpret the future-relevant information that has been collected via foresight practices (Rohrbeck, 2010). This can be further deconstructed into the ability to use foresight methods to integrate information into plausible futures of the business environment and the level of methodological rigor and comprehensiveness that a firm exerts when going through the several stages of a foresight procedure. Indeed, several foresight practitioners have attributed the effectiveness of foresight practices to the comprehensiveness of the foresight process (Hines & Bishop, 2015; Micic, 2010). Additionally, assessing measures of rigor of foresight methodologies, such as validity, reliability, transparency, and reproducibility, is becoming an increasingly focal concern in the futures studies and foresight literature (Kuusi, Kuhls, & Steinmuller, 2015). For its importance in interpreting external signals to rigorously build possible futures, this is a *seizing* component of corporate foresight capability.

Technique variety and integration. Technique variety and integration refers to the ability to choose the right foresight method according to context and goals, to the number of different foresight techniques systematically used by the firm, and to the ability to seamlessly integrate them in practice. Indeed, a common recommendation in the futures studies and foresight literature has been to use a combination of different foresight techniques to be effective (Daim, Rueda, Martin, & Gerdsri, 2006; Heger & Rohrbeck, 2012). It follows that a firm's foresight capability is more developed if it uses a combination of appropriate methods, such as roadmapping, Delphi, and scenario

planning, rather than only one method repeatedly. For its importance in righteously choosing methods to interpret external signals and sort them into possible futures, this is a *seizing* component of corporate foresight capability.

Foresight–strategy linkage. Foresight–strategy linkage refers to the ability of the firm to use foresight as an input to strategic decision-making. This occurs when the information on the possible futures of the business environment generated via foresight practices is translated into clear strategic guidelines on how the firm should act to build future preparedness. Indeed, a common pitfall of foresight practice is the lack of awareness on how to use the information produced for strategic reconfiguration, a complaint often voiced by foresight practitioners inside organizations (Hammoud & Nash, 2014). Moreover, the difference between foresight methods aimed at detecting changes in the environment and creating possible futures and methods aimed at deriving strategic guidelines from these futures has been underscored by several authors, who have identified in the latter the real value of foresight for competitive advantage. Some of these techniques are strategic options (Porter, 1985a), wind-tunneling techniques to test current business models or strategies against possible future scenarios (van der Heijden, 2005), or more complex combinations of wind tunneling and decision analysis (Goodwin & Wright, 2014b), among others. For its importance in being able to change resource configuration and decision-making to achieve competitive advantage, this is a *reconfiguring* component of corporate foresight capability.

Foresight system. Foresight system refers to the kind of procedural system in place that supports a recurrent and consistent use of corporate foresight activities in an organization over time. This includes the level and kind of incentives for organizational members to undertake foresight, the systematic integration of foresight with other first-order activities of the firm (elements attributed to the *organization* dimension by Rohrbeck [2010]), and the level of routinization of foresight practices. Indeed, institutionalizing foresight in the organization over time and constantly updating previously undertaken foresight exercises' outputs are considered paramount for the success of foresight (Hines & Bishop, 2015). Routinization has also been recognized as a fundamental element of dynamic capabilities (Schilke, Hu, & Helfat, 2018; Teece, 2007). For its importance in promoting the implementation of foresight in general, this is a *supporting* component of corporate foresight capability.

Futures orientation. Futures orientation refers to the extent to which the organizational environment is supportive of foresight approaches that embrace an open and exploratory stance toward more than one possible future. Indeed, futures studies and foresight scholarship has moved away from prediction and recognized its methodological limitations (Inayatullah, 2002; Voros, 2007). Consequently, in firms where the management has strong beliefs in the usefulness of predictions of the future through trend extrapolation, corporate foresight exercises are meant to be short-lived and ineffective. For its importance in promoting the implementation of foresight in general, this is a *supporting* component of corporate foresight capability.

ARGUMENT 2: ON THE ANTECEDENTS OF CORPORATE FORESIGHT

Corporate foresight is a capability developed by firms primarily as the contingencies of the external environment compel them to do so.[3] As such, the theorization of corporate foresight capability is closely aligned with the contingency theory of the firm. According to contingency theory, optimal strategic decisions are not absolute; they are determined by the most salient idiosyncratic external and internal factors distinguishing a particular firm (Donaldson, 2001). In the case of corporate foresight, these are most notably the *dynamism* and the *complexity* of the external environment, which directly compel firms to develop the future-oriented intelligence of foresight. This also aligns with the notion that organizational environment can substantially affect the emergence of dynamic capabilities in general (Schilke et al., 2018).

Moreover, the contingent effects of the environment on the emergence of corporate foresight are likely intensified by the firm's awareness of its incomprehension of the environment and by its absorptive capacity. Contingent internal factors—that is, firm characteristics—might also directly affect the development of foresight.

As all these mechanisms are either macro or micro organizational phenomena, the emergence of

[3] Whether firms develop dynamic capabilities under all business environments or only in turbulent and uncertain ones is still under debate (Schilke et al., 2018; Wilden, Divinney, & Dowling, 2016). The position of this article is that corporate foresight can be present under all environments but is specifically spurred by environmental dynamism and complexity.

foresight in organizations is a relevant phenomenon that deserves close scrutiny by strategy and management scholarship. These different antecedents are elaborated in more detail below. The relations between these constructs and corporate foresight capability are displayed on the left part of Figure 2.

Environmental Dynamism

Environmental dynamism is a contingent external factor that impinges on the development of corporate foresight capability.

The dynamism or volatility of the business environment has been referred to in several ways, most commonly as *environmental dynamism* (which this article adopts), *industry dynamism*, or *turbulence,* among others. Datta and Rajagopalan (1998: 138) defined industry dynamism as "the extent to which a firm faces an environment that is predictable and stable or changing and uncertain." Karaevli (2007: 689) defined turbulence as the "difficulty to predict changes in the environment." A more sophisticated definition was provided by Jissink et al. (2014) who viewed environmental dynamism as made up of two components: rate of change and unpredictability of change. Indeed, according to a comprehensive definition of VUCA (Bennet & Lemoine, 2014b), this construct encompasses volatility, or the frequency of change independently of its predictability; as well as uncertainty, or the incapability to predict change.

Environmental dynamism affects the dynamic capabilities of the firm, such as the "capacity and willingness of individuals to deal with complexity and change" (Datta & Rajagopalan, 1998: 138), and individual exploration capabilities (Karaevli, 2007).

As corporate foresight is a dynamic capability, environmental dynamism can directly lead to an increase in corporate foresight capability. Several authors have noted that environmental dynamism is a direct cause of the implementation of foresight with the aim to increase future preparedness (Becker, 2002; Jissink et al., 2014). This is in line with contingency theory, which states that firms shape their managerial choices and organizational structures according to contingent factors, among which is the environment (Donaldson, 2001).

Environmental Complexity

Environmental complexity is another contingent external factor impinging on the development of corporate foresight capability. Complexity refers to the difficulty in understanding the environment, and in the difficulty in gathering information to do so (Jissink et al., 2014). Complexity is distinguished from uncertainty and volatility, conveyed by environmental dynamism as above, as it indicates the degree of sophistication and interconnection between parts of a system, although it does not necessarily involve change (Bennet & Lemoine, 2014b). According to contingency theory, perilous characteristics of the environment impel the firm to develop new capabilities and processes to regain fit, recreating alignment between the environment and organizational characteristics and maintaining performance (Donaldson, 2001). When a firm faces contingent complexity, it has difficulties in assessing the impact of environmental changes in the future, and is spurred to implement dynamic procedures and techniques aimed at doing so, such as corporate foresight (Jissink et al., 2014). This would increase its foresight capability.

Moderators

The above-identified direct effects of external contingencies on corporate foresight capability can vary between different firms in the same environment. Two moderating mechanisms are most salient: *environment incomprehension awareness*, and *absorptive capacity*.

Environment incomprehension awareness. Rohrbeck (2010) noted that a firm engages in foresight when it lacks knowledge about environmental change. This can happen for a number of reasons: the strategy of the firm is too short-term-oriented, the firm does not have research "sensors" in place that allow it to detect environmental change, the firm is incapable of understanding the impact of emerging issues, or the information fails to reach the appropriate level of management or is somehow filtered when it does so (Rohrbeck, 2010). Indeed, Burt and van der Heijden (2008) argued that a firm implements foresight when it is aware of a substantial deficiency in any of the three components of its appreciative system in interpreting external reality—that is, sensemaking, value judgments, and strategic choices. Wack (1985b) also noted that firms encounter strategic failures when their assumptions about the future—that is, predictions of how the business dynamics will unfold—are proven to be wrong. This entails that firms that become aware of their future-relevant cognitive fallacies will be spurred to change their learning approach toward the future when the dynamism and complexity of

the environment compel them to do so. It follows that firms that are more aware of their incomprehension with regard to rapid changes in an uncertain environment will be more likely to implement foresight procedures and develop foresight capability amid environmental dynamism and complexity. This suggests a moderating role of incomprehension awareness in the impact of environmental contingencies on corporate foresight development.

Indeed, Elenkov (1997) postulated that perceptions of uncertainty can affect the frequency of scanning behaviors, but did not found evidence for the postulated direct effect, further suggesting that the mechanism linking an unstable business environment, awareness of its incomprehension, and implementation of foresight could be a moderating one, dependent on environmental dynamism and complexity and intensified when the awareness of these attributes are higher.

Absorptive capacity. Absorptive capacity is a widely used construct, originally developed by Cohen and Levinthal (1989), that refers to the ability of the firm to recognize, assimilate, and use external knowledge (Lane et al., 2006; Wang & Ahmed, 2007). Firms with higher absorptive capacity are more likely to recognize the value of and exploit new knowledge relevant to their business (Cohen & Levinthal, 1990). This is a firm-level awareness similar to the awareness of incomprehension of the environment. Absorptive capacity is also largely dependent on prior knowledge (Cohen & Levinthal, 1990), thereby incorporating the argument that firms with higher absorptive capacity will likely be more knowledgeable of the importance of foresight in dynamic and complex business environments. This suggests a moderating role of absorptive capacity in the impact of environmental contingencies on corporate foresight development.

Absorptive capacity also allows a firm to mimic the environment for evolutionary fitness. As the absorptive capacity of the firm increases when there are incentives in the environment that facilitate the absorption of capabilities to create value (Cohen & Levinthal, 1989; Lane et al., 2006), when corporate foresight becomes a widespread operational function of firms in a dynamic and complex environment, those firms capable of better assimilating and mimicking the expertise present in the competitors' landscape will be more likely to learn cutting-edge foresight methods and integrate them in their operations amid environmental dynamism and complexity. It follows that environmental contingencies and absorptive capacity can interact in their effect on the development of corporate foresight.

Firm Characteristics

Other nondiscountable antecedents of corporate foresight capability are internal contingencies, or firm-specific characteristics. Jissink et al. (2014) identified *market orientation* and *entrepreneurial orientation* as direct firm-level antecedents of corporate foresight. Other salient antecedents are *organizational culture* and *organizational structure*. These antecedents are elaborated in more detail below.

Market orientation. Market orientation can be conceptualized in two ways. According to the first, it is the ability to generate and disseminate market intelligence by responding to present and future customers' needs (Kohli & Jaworski, 1990; Morgan, Vorhies, & Mason, 2009). According to this conceptualization, given that an orientation toward the future is embedded in this notion, it follows that firms with a greater market orientation will be more likely to develop foresight.

According to the second conceptualization, firms can be distinguished between *market driven*, or those that react to the market; and *new market creators*, or those that attempt to shape the market (Wilden et al., 2016: 1033). Following this conceptualization, corporate foresight will be more likely to develop in the latter category of firms than in the former as the intention to create new markets spurs the firm to imagine and roadmap future technologies and products.

Entrepreneurial orientation. Entrepreneurial orientation is generally considered to involve two main characterizing components. The first is the degree of proactiveness and innovativeness by which a firm can outperform competitors with new products, processes, and business models. The second is the degree of managerial risk-taking toward strategies with uncertain outcomes (Anderson, Kreiser, Kuratko, Hornsby, & Eshima, 2015). Both components have a direct positive relation with foresight. More proactive firms will be more likely to implement cutting-edge processes, such as foresight methods, to outperform the competition. The initial implementation of foresight in the firm also involves risk-taking, as the firm has to invest its human resources or monetary resources in activities that it has not performed before and whose strategic outcome is uncertain.

Moreover, Lumpkin and Dess (1996) identified two additional dimensions of the entrepreneurial

orientation construct: autonomy, or the firm's tendency toward independent strategic initiatives; and competitive aggressiveness, or the firm's propensity to challenge competitors by relying on nontraditional competing methods. These traits also have direct relations with foresight. Highly autonomous firms will be more likely to develop foresight as a consistent capability over time in order to avoid relying on external outsourcing. Highly aggressive firms will also be likely to use foresight as a tool to concoct nontraditional ways to challenge competitors.

Organizational culture. A firm's culture is constituted by its main organizational assumptions, or taken-for-granted, deep-held beliefs; its values, or standards of operational rightfulness; and artifacts and symbols, or its more immediate and visible cultural manifestations (Hatch, 1993).

An organization's culture can enable corporate foresight on multiple fronts. The first is via cultural dynamism[4]—that is, the likelihood that it will frequently change underlying assumptions in light of new evidence. As foresight is a critical process, with epistemological underpinnings in futures studies, as noted above, that often aims at questioning current assumptions in light of new evidence, it follows that firms with higher cultural dynamism will be more likely to develop a stronger foresight capability.

Second, other organizational cultural factors, such as support for strategic conversation, perspective-taking, and reflexivity outside of the *C*-suite, are important determinants of foresight, while others, such as emphasis on formal knowledge and technical rationality, can hinder it (Sarpong & Maclean, 2016)

Organizational structure. The structure of an organization can be conceptualized on a continuum from mechanistic to organic. Mechanistic organizations emphasize formality, control, reporting, and centralized decision-making. Organic organizations emphasize open communication and decentralization (Lawrence & Lorsch, 1967). Owing to the notion that corporate foresight should be a social practice permeating the organization at large, it follows that organic firms will be more likely to develop foresight. Indeed, forms of organizational decentralization and distributed decision-making are beneficial to dynamic capabilities as they decrease the distance between the upper management and new technologies or new market dynamics (Felin & Powell, 2016; Teece, 2007).

In sum, a firm is spurred to develop foresight to achieve competitive advantage as a response to the contingency of a turbulent environment. This mechanism can be intensified by the extent to which a firm is aware of its incomprehension of the environment, and by its relative absorptive capacity. The internal contingencies noted above—that is, firm-specific characteristics such as market orientation, entrepreneurial orientation, organizational culture, and organizational structure—can also affect the development of corporate foresight. As this model's aim is not to be comprehensive but to highlight the salience of the construct of corporate foresight for strategy and management scholarship, it does not elaborate on other minor, albeit potentially important, drivers of corporate foresight capability, such as firm size, financial resources, and technological resources, which have been argued to be key determinants of dynamic capabilities (Schilke et al., 2018).

Although corporate foresight research has been featured primarily in futures studies and foresight journals, the nature of these phenomena is primarily organizational—that is, they are closely aligned with the contingency theory of the firm and with the dynamic capabilities framework. As such, the study of the emergence of corporate foresight is of relevance and interest for strategy and management scholarship.

ARGUMENT 3: ON THE OUTCOMES OF CORPORATE FORESIGHT

Without prior knowledge on foresight, one could be tempted to assert that assessing its effectiveness is done by testing whether it produces accurate predictions of the future of the environment in which the firm operates, and that this is beneficial for the firm. However, this would be erroneous.

From the epistemological underpinnings discussed above, we can see how the ultimate aim of corporate foresight capability is not the righteousness of prediction, since it neither aims at nor engages in prediction. Indeed, although some foresight practitioners have assigned probabilities to scenarios (Ramírez & Selin, 2014), there is increasing consensus in the futures studies and foresight community that doing so downplays complexity and unpredictability (Derbyshire, 2017). In contrast, corporate foresight can be effective in enhancing the

[4] Organizational cultural dynamism differs from organizational cultural strength—that is, the extent to which organizational assumptions, values, and manifestations are well-understood throughout the organization (Baumgardner, 2012).

firm's competitive advantage by developing a preparedness-capability by means of exploring a range of possible futures. This range, if a firm's foresight is well-developed, will be wide and inclusive of several "what if" scenarios and systematic doomsday collapses. It is by evaluating this range of futures that the firm learns and grows. The effectiveness of foresight is therefore assessed on a wide range of outcomes derived from the careful evaluation and usage of these futures to reconfigure decision-making and maintain competitive advantage. These outcomes can be categorized into two families. The first includes organizational-level outcomes: *performance, innovation,* and *organizational learning*; the second includes individual-level outcomes: *environmental change awareness, change of mental models, complexity understanding,* and *creativity*. As these outcomes are phenomena that have long been studied by strategy and management scholars, the novel and underinvestigated path leading to them via foresight is relevant to strategy and management scholarship. This section gathers evidence and conceptual contributions from the futures studies and foresight literature and from the dynamic capabilities framework to elaborate on the effect of corporate foresight capability on the said outcomes in more detail below. The relations between these constructs and corporate foresight capability is displayed on the right-hand side in Figure 2.

Organizational-Level Outcomes

Performance. One of the most widely claimed outcomes of corporate foresight capability is its positive effect on firm performance. Indeed, this is in line with the dynamic capabilities literature, as a recent comprehensive review has shown that most of the 113 studies that investigated the effect of dynamic capabilities on performance have found a positive effect (Schilke et al., 2018). In a longitudinal study, Rohrbeck and Kum (2018) assessed the effect of future preparedness, an indicator expressing the extent to which firms' corporate foresight activities were commensurate to their foresight needs as measured in 2008, on firm performance as measured in 2015. The authors found that firms that were future-prepared, or "vigilant," were 33% more profitable than their industry average. Scenario planning has also been tentatively related to performance in two firms (Phelps, Chan, & Kapsalis, 2001) and by managers' assessment (Visser & Chermack, 2009).

The link between foresight and performance can also be traced back to works outside of the futures studies and foresight tradition. Indeed, Day and Schoemaker (2004, 2005) argued that scanning the environment for discontinuities, which is embedded in corporate foresight practices, is fundamental for firm adaptation and survival. The intention to achieve better performance is also built into the three foundational subcomponents of dynamic capabilities: (a) sensing environmental changes to (b) seize opportunities to achieve advantage over competitors and subsequently (c) reinvest obtained resources to make this advantage sustainable (Teece, 2007).

Innovation. Various forms of innovation, including product innovation, service innovation, systematic organizational innovation, and business model innovation, have been acknowledged to be primary outcomes of foresight in organizations. Yuan, Hsieh, and Chang (2010) identified several benefits of foresight activities, most of which can be categorized under two dimensions: system innovation and product innovation. Sarpong and Maclean (2011), over three case studies, showed that scenario thinking acts as a precursor to product innovation by leading to identification of new opportunities. Among the key impact factors of foresight, Rohrbeck (2010) identified the potential to initiate new research and development (R&D) projects and indicate new business development directions. Miles et al. (2016) pointed out that foresight can change investment priorities, thereby possibly engendering product innovation. Worthington, Collins, and Hitt (2009) argued that the practice of scenario planning can foster innovation by making a firm aware of new opportunities, and of how to better exploit its capabilities and resources to pursue them. This is valid for product and service innovation, but also for business model innovation (Worthington et al., 2009).

Moreover, the claim that foresight can affect product and system innovation is aligned with the dynamic capabilities literature. Suddaby, Coraiola, Harvey, and Foster (2020) postulated that the ability to imagine convincing futures can lead the firm to imagine new technological applications and to reconfigure its entire business model around them. Teece (2007) explained that dynamic capabilities are entrepreneurial in nature in that they allow the firm to sense and seize opportunities, and Fallon-Byrne and Harney (2017) explained that several elements of dynamic capabilities, such as the search for opportunities, the acceptance of new ideas, and risk-taking are fundamental to engender product, service, and system innovation.

Organizational learning. One of the most widely noted outcomes of foresight in corporations is

organizational learning. Organizational learning is "the process of improving actions through better knowledge and understanding" (Fiol & Lyles, 1985: 803). Organizational learning has been measured through the Seven Dimensions of the Learning Organization Questionnaire, or DLOQ (Watkins & Marsick, 1997), an instrument that has been used and validated in several countries and different settings (Marsick, 2013). It consists of seven dimensions: (a) creating continuous learning opportunities, (b) promoting inquiry and dialogue, (c) encouraging collaboration and team learning, (d) establishing a system to capture and share learning, (e) empowering people toward collective vision, (f) connecting the organization to its environment, and (g) providing strategic leadership for learning (Marsick, 2013: 130).

Dimensions of this construct have been noted to be a primary outcome of foresight in organizations by several authors based on empirical evidence and practitioners' advice (Iden et al., 2017; Johnston, 2012; Rohrbeck, 2010; Rohrbeck & Schwarz, 2013; Schwartz, 1996; van der Heijden, 2005; Yuan et al., 2010). Johnston (2012) argued that foresight leads to insight generation, participation and engagement in problem-solving, individual and shared understanding, clarification of hidden and implicit goals, identification of hidden obstacles to strategy, implementation of follow-up activities and programs, and launch of new projects. Yuan et al. (2010) stated that foresight leads to better organizational coordination and communication.

Indeed, the practice of scenario planning has been found to be positively associated with increased organizational learning in six of the DLOQ dimensions (Chermack, Lynham, & van der Merwe, 2006; Haeffner, Leone, Coons, & Chermack, 2012).

However, besides organizational learning, these authors have also acknowledged that foresight positively affects learning in two additional individual level dimensions: *environmental change awareness,* and *change of mental models,* which are absent in the DLOQ instrument.

Individual-Level Outcomes

Environmental change awareness. A recent systematic literature review showed that, across a variety of case studies, enhancement of perception is the most prominently claimed outcome of foresight (Iden et al., 2017). Johnston (2012) argued that foresight leads to an increase in awareness of the challenges to come. Yuan et al. (2010) stated that foresight leads to building an early warning system. Iden et al. (2017) identified four outcomes of foresight: (a) influencing other actors, (b) organizational learning, broadly defined, but also (c) enhanced capacity to perceive change; and (d) enhanced capacity to interpret and respond to change. Among the impact factors of corporate foresight, Rohrbeck (2010) identified reduction of uncertainty via detection of early warning signals and emerging change. Rohrbeck and Schwarz (2013) found that the outcome of foresight is perceived to be a capacity to interpret and respond to change. Indeed, in surveys aimed at exploring the penetration of foresight in European firms, Daheim and Uerz (2008) found that foresight is widely believed to serve as an early warning system to gather information about the environment and generate knowledge.

Moreover, the idea that foresight enhances the awareness of environmental changes is not only found in the futures studies and foresight literature. Porter (1985a) noted that scenarios can help explicitly surface future industry uncertainty in the mind of decision-makers. Suddaby et al. (2020) postulated that the ability to read the past to imagine possible futures can lead to understanding the "grammar of technology."

Therefore, learning about the environment and about how it could change in several ways in the future is a recurring theme in several streams of literature. Foresight renders tacit knowledge about changes in the environmental explicit, helping organizational members to realize that there are more choices than previously thought (Vecchiato, 2015b). The reason behind this was explained by Chermack and Swanson (2008), who noted that foresight can build mnemonic experience that does not substantially differ from individuals' real past memories, as individuals cannot distinguish between what has been seen and what is remembered (see also LeDoux, 2000; Schwartz, Stapp, & Beauregard, 2005.). This argument has been corroborated by a growing body of research showing that imagining the past and the futures involves the same neurocognitive system (Berntsen, & Bohn, 2010; Schacter, Addis, & Buckner, 2007). Indeed, foresight contributes to creating the building blocks of organizational "memories of the future," enriching foresight practitioners' experience about possible future paths, which, stored in memory, increase future preparedness via simulation (Vecchiato, 2012a).

Change of mental models. Challenging mental models has also been extensively acknowledged to be among the benefits of foresight to the firm. Since

Wack (1985a, 1985b), who argued that scenario planning is fundamentally an art to reperceive the strategy of the firm, several authors have highlighted the power of foresight to question dominant strategic assumptions (Rohrbeck, 2010; Vecchiato, 2015b). This does not substitute rational thinking but potentially complements it by revealing new indicators to monitor or new types of data to be collected (Kastrinos, 2018). Indeed, scenario planning has been found to change mental model styles, promoting the efficiency-based, social, and systematic styles and inhibiting the political style (Glick, Chermack, Luckel, & Gauck, 2012); to alter decision-making styles, promoting intuitive and dependent styles while inhibiting the rational, avoidant, and spontaneous styles (Bodin, Chermack, & Coons, 2016; Chermack & Nimon, 2008); to decrease cognitive biases (Meissner & Wulf, 2013); to alter investment preferences and increase strategic flexibility (Phadnis, Caplice, Shelffi, & Singh, 2015); to question and adapt strategic beliefs (Vecchiato, 2019); and, along with scanning procedures, to be effective in shifting managerial attention (Ramírez, Osterman, & Gronquist, 2013).

Indeed, Inayatullah (2013) explained that the critical approach, drawing from post-structuralism, is a key tenet of futures studies and foresight, an approach aimed at questioning the status quo and at deconstructing the hegemonic view of the most likely future in favor of new and diverse worldviews and ideologies. The critical approach is in fact the basis of a seminal and widely used foresight tool: causal layered analysis (Inayatullah, 1998).

Complexity understanding. Foresight, with its multiperspective, multidisciplinary, and ecosystem viewpoint, also allows organizational members to analyze systems' complexity (Horton, 2012). Foresight can help organizational members to understand what complexity means inside the organization (the internal workplace system), as well as outside the organization (the environmental system). This occurs because complexity is a key element of foresight practice. Complexity emphasizes the system viewpoint: interactions between parts of the system are more important than understanding its constituent parts (Horton, 2012). The understanding of complexity in organizations can be assessed as the capacity to see the interrelations of parts in a system (environment), to see that the whole system can suddenly change in a substantial way by anticipating elemental changes without strong early signals, and to see that tiny organizational changes can amplify dramatically in the future (Horton, 2012).

Creativity. The notion that exploring and evaluating different possible futures enhances creativity has been deeply embedded in the futures studies and foresight literature. In the identification of trends and discontinuities, particular attention has been focused on looking for outlandish, niche, even ridiculous technological advances that can be potentially highly disruptive if and when they pan out (e.g. Webb, 2016). Several scenario planners have also recommended tapping into one's own imagination when creating scenario narratives (Chermack, 2005; Schwartz, 1996; van der Heijden, 2005; Wade, 2012). In the scenario communication process, liveliness, playfulness, and empathy are in fact elements that future scenarios must convey. Some foresight practitioners have presented their scenarios with colorful artwork (Lederwasch, 2012), fictional personas (Fergnani, 2019b) separate rooms decorated with artifacts "from the future" (Dator, 2009), songs, catchy slogans, videos, podcasts, roleplaying games or even a veneer of mystique around them (Chermack, 2011). Some foresight methods have been specifically recommended to enhance creativity in organizations' R&D departments (e.g. Schultz, Crews, & Lum, 2012).

Indeed, Chermack, Coons, Nimon, Bradley, and Glick (2015) found that participants in scenario-planning exercises reported significantly higher perceptions of creative organizational climate. Rollwagen, Hofmann and Schneider (2008: 341) studied a foresight project undertaken by Deutsche Bank Research, and also identified inspiration as a key guiding outcome of foresight, in the form of "frame-breaking thinking" and identification of "truly new issues."

In sum, corporate foresight has been postulated to lead to several firm-level and individual-level outcomes, including creativity, learning, innovation, and performance via the evaluation of an inclusive range of possible futures. These mechanisms are highly relevant to strategy and management scholars studying emergent phenomena in organizations.

ARGUMENT 4: A RICH RESEARCH AGENDA

Corporate foresight integrates with, enriches, and expands the dynamic capabilities framework by including an additional, previously underinvestigated, future-oriented firm capability. Its emergence, primarily due to environmental instability, is closely aligned with the contingency theory of the firm. It can affect important organizational outcomes, including learning, creativity, innovation, and

performance via a mechanism to create corporate advantage that has not been previously explored by strategy and management scholarship: the evaluation of a range of possible futures. However, acknowledgment of the relevance of this construct for theories of the firm is only the starting point. The measurement and investigation of corporate foresight as a dynamic capability can potentially open a research agenda that is rich in opportunities, especially given that theoretical advancement in corporate foresight has been weak, dominated by case studies, or lacking in scientific rigor or agreed theoretical foundations (Iden et al., 2017). This is apparent on multiple fronts, including promising directions for more sophisticated investigation of its antecedents, components, outcomes, and moderating mechanisms. These research opportunities are presented in summarized form in Table 2, and elaborated in more detail in separate sections below, along with the most salient methodological recommendations for researchers interested in undertaking research on corporate foresight.

Research Agenda

Antecedents. With regard to why and how corporate foresight emerges in organizations, it will be fundamental to empirically investigate the joint effects of the many internal and external contingencies elaborated above. Indeed, environmental dynamism and complexity, the awareness of environmental incomprehension, absorptive capacity, and firm orientations have been separately postulated to affect the development of corporate foresight, but their joint effects are unclear. Absent from the literature are discussions on the role of industrial sectors or geographical areas, or on the role of economic crises and doomsday events—factors that are also likely impinging on the development of corporate foresight. Additionally, environmental dynamism and complexity often refer to the industrial and business environment, while the instability of the political climate and the speed of social change are also antecedents that deserve separate investigations. These investigations can also be undertaken longitudinally to determine whether corporate foresight is responsive to economic, political, and social instability, and whether it recedes when the risk of doomsday abates.

The channel through which firms first implement foresight, and its introduction and dissemination from the upper management to the firm at large, are also topics that lend themselves well to process-cognizant qualitative inquiries. Additional potential antecedents not displayed in the illustrated model (Figure 2), might also be firm size, financial resources, and technological resources.

Finally, corporate foresight, as a dynamic capability, is likely to improve heuristically through learning by doing. Indeed, Pisano (2002: 150) noted that "the seeds of today's capabilities are sown in yesterday experience." Eisenhardt and Martin (2000) also argued that repeated practice contributes to the evolution of dynamic capabilities. Therefore, it would be interesting to investigate whether previous foresight experience creates a loop by increasing its own value over time.

Components. To derive practical implications for firms, it will be paramount, first, to separately examine the different impact of each component of corporate foresight capability on each firm outcome, and the ways these components are differently affected by external and external contingencies while foresight emerges. Second, it will be vital to examine which component of foresight can and should emerge first. Indeed, Eisenhardt and Martin (2000) argued that the order of implementation can substantially affect the evolution of dynamic capabilities. Third, it will be important to study which components of foresight enable firms to withstand doomsday events with discontinuity research designs. Fourth, the effects of each component on others and their variance across industrial sectors and geographical locations also constitute valuable research directions.

Lastly, qualitative inquiry could shed light on the processes by which practitioners perceive the progress of a foresight activity. Indeed, scenario planners at Shell have argued that scenario-planning workshop participants experience a sequence of emotional stages while studying the future: initial excitement, information overload, subsequent disorientation due to perception of inability to sort out too many ideas, and finally elation due to new clarity about the future (Grundy, 2008: 51).

Outcomes. Investigation of the outcomes of corporate foresight presents a plethora of research opportunities for strategy and management researchers. First, a research direction that requires urgent attention is the formulation and testing of a more sophisticated mediation model explaning how this construct leads to firm-level outcomes. Indeed, Wilden et al. (2016) underlined the need to empirically assess intermediate outcomes of dynamic capabilities to further advance dynamic capabilities scholarship, and the literature in futures studies and foresight has offered plenty of inspiration to do this. For instance, corporate foresight could indirectly affect innovation and

TABLE 2
Most Salient Future Research Opportunities in Corporate Foresight (Not Displayed in the Model)

	Antecedents	Components	Outcomes	Second-Stage Moderators
Future research opportunities	• Joint effect of internal and external contingencies • Industrial sectors • Geographical areas • Economic crises and doomsday events • Political instability • Speed of social change • Channel of introduction and dissemination • Firm size • Financial resources • Technological resources • Prior experience	• How components differently affect outcomes • How components are differently affected by antecedents • Order of components' implementation • Which component(s) buffers against doomsday scenarios • Variance of components across industries and geographical areas • Individual perceptions of foresight processes	• Mediating role of learning in the impact of foresight on innovation and performance • Mediating role of resource-base reconfiguration in the impact of foresight on all firm level outcomes • Two stage mediation: corporate foresight > new business opportunities > resources base changes > performance • Organizational identity • Organizational restructuring • Other individual outcomes such as engagement at work and job satisfaction	• Environmental dynamism • Opportunity cost of foresight • Firm structure • Firm size

performance via increased learning. Chermack (2005) stated that it is inherent in foresight practice that the learning and change in mental models originating from scenarios ultimately affect firm performance. Yoon, Kim, Vonortas, and Won Han (2018) found that the effect of corporate foresight capability on firm attitude to innovate is mediated by organizational learning; Vecchiato (2019) found that scenario planning makes individuals challenge their beliefs about the external environment, which in turns makes them more prepared to external events regardless of the content of the scenarios; and Protogerou, Caloghirou, and Lioukas (2011) found that dynamic capabilities have only an indirect, not a direct, effect on firm performance. Therefore, it is possible that a mediation mechanism is also at play in the case of corporate foresight's effect on outcomes such as product innovation, system innovation, and performance.

In the particular case of performance, it has been shown that this was the focal issue of concern of dynamic capabilities scholarship before the micro foundations of dynamic capabilities were introduced by Teece in 2007, and that after that date the scholarly debate shifted toward dynamic capabilities' underlying processes (Wilden et al., 2016). Therefore, a renewed opportunity for scholars studying the dynamic capabilities framework is to zero in again on the impact of dynamic capabilities on performance in light of the newly emerged phenomenon of corporate foresight.

Strategy and management scholars could also draw from the dynamic capabilities framework to investigate whether corporate foresight capability allows a firm to change its resource base. Indeed, dynamic capabilities have been shown to affect resource configuration (Stadler, Helfat, & Verona, 2013), and the same mechanism might be at play with regard to corporate foresight. Moreover, research in this domain would offer valuable opportunities to explore the mediating role of resources in the effect of corporate foresight on firm outcomes. A more sophisticated two-stage mediation model in this research direction would be to hypothesize that corporate foresight leads to the identification of new business directions, or to the withdrawal from old ones, which in turn affects the firm's resource base, ultimately leading to performance in the long run. Indeed, the notion that corporate foresight leads to better performance due to the identification of new business opportunities has been reported in several case studies (e.g., Daimler and Philips [Vecchiato, 2012b]; Deutsche Bank [Rollwagen, et al. 2008]).

Another opportunity for further research on the outcomes of corporate foresight is exploring whether and how this phenomenon affects organizational identity. Indeed, Ravasi and Schultz (2006) showed that external business threats can lead organizations to reevaluate their organizational identity. As corporate foresight often leads to question organizational members' assumptions not only toward the business

environment but also toward the organization, it is arguable that corporate foresight might lead to reformulating the organization's identity, image, vision, or perceptions of identification. The investigation of these processes lends itself well to qualitative research approaches.

Yet another opportunity for further research, in line with the reconfiguring aspect of dynamic capabilities (Teece, 2007), is to investigate whether foresight leads a firm to substantially change its organizational structure. In this article, organizational structure has been postulated to be an antecedent of corporate foresight, but a feedback loop is also likely to exist.

A final opportunity for further research in this domain is to investigate the effect of corporate foresight on individual-level outcomes that have not been mentioned in this article. Indeed, Chermack et al. (2019) found that the practice of scenario planning positively affects organizational perceptions of work engagement in all of its three components (vigor, dedication, and absorption). Therefore, given that foresight practices are aimed at reaching a greater understanding among organizational members about how the future may unfold, it is arguable that foresight capability acts as a glue between organizational members, increasing their engagement and well-being at work, as well as their job satisfaction.

Moderating mechanisms. It is arguable that the effect of corporate foresight on firm-level outcomes could be moderated by environmental factors or internal contingencies. Regarding the former, environmental dynamism could be considered as an intensifier in the effect of dynamic capabilities on performance for the same reason it spurs companies to develop these capabilities (Schilke et al., 2018). Indeed, firms with mature dynamic capabilities are more likely to survive in business environments with high, rather than low, dynamism. Regarding internal contingencies, it is arguable that the opportunity cost of foresight vis-à-vis the implementation of other important organizational activities could act as a buffer in the impact of corporate foresight on firm level outcomes. The same argument could be raised for firm size and structure, which, while being potential enablers, might also act as obstacles.

Methodological Recommendations

Investigating corporate foresight presents several methodological challenges. The first challenge lies in the operationalization and measurement of this construct. As mentioned above, it is more fruitful to measure the components of corporate foresight as ordinal rather than categorical variables to facilitate statistical regression. Just as other dynamic capabilities, this can be done by generating Likert-type evaluations by managers (Laaksonem & Peltoniemi, 2018) that refer to the components elaborated above, or by determining indicators of organizational members' knowledge, skills, and behavior (Laaksonem & Peltoniemi, 2018) with regard to foresight. However, a number of caveats about measurement are due: (a) the measurement of corporate foresight, as a dynamic capability, should be distinguished from ordinary activities, such as resources; (b) attention should be paid to measuring foresight and its outcomes with different data sources, and, most importantly; and (c) although this article conceptualizes corporate foresight as an organizational-level capability, the construct can and should be measured at different levels of analysis—that is, individual, team, and organization. As corporate foresight can have different effects on the same outcome variables at different levels, it is important to clearly distinguish and define the level of research and, accordingly, formulate multilevel models to take into account postulated interrelations across levels, if any. Measurement should consequently be conducted differently according to the level of analysis; for example, mental models of individuals are to be measured differently from firm-level corporate foresight components.

Second, as the effect of corporate foresight on firm-level outcomes can be confounded by specific industry configurations, it is important to account for heterogeneity in measurement models. When heterogeneity is assumed to be clustered in groups, such as business sectors, this could be achieved by adding dummy variables for different industries, or by measuring foresight as a relative construct in relation to the sector need or dynamism, as performed by Rohrbeck and Kum (2018). When heterogeneity is assumed to be independent of business sectors, so that firms vary in their optimal joint configuration of foresight capability with other dynamic capabilities, this could be achieved by using random-effects or mixed-effects models (see Fitzmaurice, Laird, & Ware, 2004).

A third major challenge in measuring corporate foresight's effect on firm outcomes is that some of these can only be reliably assessed longitudinally with a significant time lag (Rohrbeck & Kum, 2018). Longitudinal data analysis requires the researcher to establish stable partnerships with firms practicing foresight over time for the sake of lagged monitoring, making the resource requirement for impactful corporate foresight research rather demanding. However, not all opportunities for research on corporate

foresight lie in longitudinal analyses. Research on dynamic capabilities is in many ways concerned with how organizations develop and transform over time (Helfat et al., 2007), making inductive qualitative inquiries on the processes of successful foresight introduction and implementation particularly valuable. Indeed, the futures studies and foresight literatures have provided several case studies with little or no attempt to use rigorous grounded theory approaches, which is an untapped opportunity for researchers familiar with such methods (see Charmaz, 2006; Glaser, 1992; Strauss & Corbin, 1998).

Moreover, given that foresight exercises are often conducted in graduate or executive education settings, many opportunities are present for researchers interested in teaching foresight while concurrently setting up laboratory experiments to assess the causality of corporate foresight on individual-level outcomes, such as mental models. These outcomes can be measured in the immediate future rather than in the long-term future. The only major challenge of this research design is random assignment, which might be difficult to put in place when teaching is prioritized, but is necessary to advance scholarship in this field as the few previously reported quantitative studies on foresight were quasi-experiments (Chermack, 2018).

A final challenge for researchers in corporate foresight is that, given its complexity, the wide array of available foresight methods and approaches, and the applied nature of foresight practice, rigorous assessment of this capability should be done only after having become familiar with foresight methods (see Appendix A), or in collaboration with professional foresight practitioners who are well-aware of the ins and outs of its introduction, implementation, and conduct.

All in all, notwithstanding these methodological challenges, the position of this article is that corporate foresight is a new frontier for strategy and management research, and is rich in research opportunities that outweigh its cost.

CONCLUSION

Corley and Gioia (2011) called for greater attention to anticipation and prescience when theorizing in management and organization research. They noted that theory-building needs to be more conscious about the challenges to come, about constructs that can be important for the future of management, and about weak signals and revelatory insights that can lead us to study incipient but impactful organizational phenomena. They noted that this is done, alas, at the cost of stepping out of our "intellectual comfort zone," which is never easy (Corley & Gioia, 2011: 29).

There is no better response to this call than studying the way organizations evaluate and grow prepared for the futures. In line with Corley and Gioia's argument, this entails using insights from literatures that we are not familiar with, and studying phenomena with paradigmatically different epistemological underpinnings. This is a small cost if compared to the potential benefit garnered by studying such phenomena: revelations on how organizations can withstand the instability of an environment that is prone to systematic doomsday collapse and unpredictable eventualities.

In view of the above, the contributions of this article lie in having introduced the construct of corporate foresight to strategy and management research; having inscribed corporate foresight in the dynamic capabilities framework; having put forward a model of its antecedents, components, and outcomes; and having outlined a rich research agenda in this line of inquiry. The literature that this article has drawn upon has been in large part practitioner-driven, simply due to the very nature of foresight practice. Indeed, because of the inherent difficulty in systematically studying foresight, several past studies that have attempted to assess the effect of foresight in organizations have been case studies, or have used pre- and post-test study designs, all of which lacked random assignment (Chermack, 2018). Often, they were based on practitioners' advice. However, it is exactly from this kind of inspiration that incipient, novel, and future-relevant phenomena are discovered, and subsequently studied, ahead of time.

In the long run, opening up and developing inquiry in this frontier of research will allow us to understand the mental models of futures thinking employed in organizations, the domains where it is most effectively used and to what ends, what future-relevant benefits it can deliver, when it is working at best to do so, and whether it can equip firms to withstand doomsday events. This will place strategy and management scholars at the forefront of counseling, in academia and practice, leading firms in navigating an increasingly complex and uncertain world. Shying away from this line of inquiry will leave this role to some other disciplines.

APPENDIX A LIST OF RESOURCES

This appendix provides a list of resources to familiarize readers with the practice of foresight in organization:

Foresight Manual, United Nations Development Program. Retrieved from https://www.undp.org/content/undp/en/home/librarypage/capacity-building/global-centre-for-public-service-excellence/foresightmanual.html

Glen, J. C., & Gordon, T. J. *Futures Research Methodology,* Version 3.0. Retrieved from www.millennium-project.org/millennium/FRM-V3.html

Inayatullah, S. 2008. Six pillars: Futures thinking for transforming. ***Foresight***, 10: 4–21.

The Futures Toolkit: Tools for Futures Thinking and Foresight Across UK Government, Edition 1.0. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674209/futures-toolkit-edition-1.pdf

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Bodin, R., Chermack, T. J., & Coons, L. M. 2016. The effects of scenario planning on participant decision-making style: A quasi-experimental study of four companies. ***Journal of Futures Studies***, 20: 21–40.

Bouhalleb, A., & Smida, A. 2018. Scenario planning: An investigation of the construct and its measurement. ***Journal of Forecasting***, 37: 489–505.

Burt, G., & van der Heijden, K. 2008. Towards a framework to understand purpose in futures studies: The role of Vickers' appreciative system. ***Technological Forecasting and Social Change***, 75: 1109–1127.

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Cairns, G., & Wright, G. 2018a. Incorporating stakeholders into scenarios. In G. Cairns, & G. Wright (Eds.). ***Scenario thinking: Preparing your organization for the future in an unpredictable world***: 55–84. London, U.K.: Palgrave Macmillan.

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