BUSHOR-1489; No. of Pages 11
ARTICLE IN PRESS
Business Horizons (2018) xxx, xxx—xxx

Available online at www.sciencedirect.com
ScienceDirect

KELLEY SCHOOL OF BUSINESS
INDIANA UNIVERSITY
www.elsevier.com/locate/bushor

Transforming under deep uncertainty: A strategic perspective on risk management

Regine Slagmulder [a,*], Bart Devoldere [a,b,c]

[a] Vlerick Business School and Ghent University, Reep 1, 9000 Ghent, Belgium
[b] TNO Netherlands Applied Scientific Research Organization, The Netherlands
[c] TomorrowLab, Belgium

KEYWORDS
Strategic risk management;
Managing uncertainty;
Strategy formulation;
Dynamic capabilities;
Business transformation

Abstract Companies increasingly face the need for transformation in today's rapidly changing business environment, characterized by major shifts in technology, regulation, and customer behavior. A lack of strategic risk insight and foresight leaves many incumbents insufficiently prepared in the face of such deep uncertainty. We argue that traditional risk management falls short because it predominantly focuses on strategy execution while leaving strategy formulation largely untouched. Moreover, an administrative-heavy risk management process can create strategic inertia and a misleading sense of control. In today's dynamic business context, companies must not only increase the speed and impact of their strategy execution but also continuously explore the development of new strategies in response to disruptive events or emerging opportunities. Our research shows how leading companies develop a strategic risk management (SRM) capability to increase their resilience and agility in response to deep uncertainty. SRM takes a strategic, forward-looking perspective and focuses on strengthening processes, people, and practices for purposefully integrating risk into the strategy formulation process. This article offers a framework with three proven configurations of content and timing integration, risk management roles, and leading practices that enable effective SRM.
© 2018 Kelley School of Business, Indiana University. Published by Elsevier Inc. All rights reserved.

1. Risk management in a dynamic environment: Need for a new capability

Companies today operate in turbulent times. They deal with a multitude of external and uncontrollable risks such as rapid technological development,

* Corresponding author
E-mail addresses: regine.slagmulder@vlerick.com (R. Slagmulder), bart.devoldere@vlerick.com (B. Devoldere)

https://doi.org/10.1016/j.bushor.2018.05.001
0007-6813/© 2018 Kelley School of Business, Indiana University. Published by Elsevier Inc. All rights reserved.

shifting customer behavior, new business models, increased regulatory pressure, and competition from unexpected geographies and sectors. Such dynamic business environments are often characterized by high velocity, complexity, ambiguity, and unpredictability (Davis, Eisenhardt, & Bingham, 2009). Companies face many new—yet sometimes difficult to identify—opportunities or threats, and it is not always clear when potential disruption might hit and what to do in response. They experience deep uncertainty, which is characterized by a multitude of unknown unknowns (i.e., they do not know what they do not know; Teece, Peteraf, & Leih, 2016). Because of such deep uncertainty, companies seem to be in need of constant transformation. It comes as no surprise then that many management studies focus on how organizations should become more resilient while building and deploying organizational capabilities to adapt dynamically and constantly reinvent themselves. More specifically, the rate of change and the challenge to foresee what future situations are to be imagined must be embedded in how firms address risk and opportunity.

The consequence of these shifts is that traditional risk management systems and processes, whether purely operational or enterprise-wide, are no longer considered appropriate for helping companies address risk and uncertainty in this new reality. Examples abound of companies devoting significant resources to state-of-the-art risk management systems while missing key strategic risks that led them into severe difficulties. Examples of corporations failing to anticipate and adequately respond to strategic risks include: Nokia being insufficiently sensitive to the technological evolution in the smartphone industry (Doz & Kosonen, 2011), news corporations such as The New York Times Company initially struggling with online news consumption, fashion retailer Abercrombie & Fitch missing shifting buyer values, and digital music disrupting Universal Music Group and other large music corporations. While advocates argue that efficient risk management practices are an important way to avoid corporate disaster (Stulz, 2008), some skeptics see risk management as part of the problem itself (Power, 2004, 2009). To the extent that the rigorous pursuit of systems and procedures leads managers to believe that their companies are safeguarded against all kinds of risk and uncertainty, traditional risk management may actually blindside them from the threats and opportunities related to deep uncertainty.

The management literature has addressed risk and uncertainty in different ways. Research in strategic management has focused on such topics as environmental scanning (e.g., Hambrick, 1982), scenario planning, and war gaming (e.g., Schoemaker, 1995) as part of strategy development and strategic planning, and the use of real options in strategic decision making under uncertainty (e.g., Trigeorgis & Reuer, 2017). However, managing strategic risk in terms of deep uncertainty is far less well developed in the literature. Exceptions are Ansoff (1980), who used weak signal identification and response to address strategic risks, and Teece et al. (2016), who introduced dynamic capability theory to deal with deep uncertainty.

Our article adds to the managerial relevance of the dynamic capabilities perspective by turning the conceptual mechanisms underlying those capabilities into concrete strategic risk management (SRM) approaches. Girotra and Netessine (2011) discussed active management of risks (e.g., through performance-driven contracting) embedded in a firm's business model and value chain as a starting point for value creation. They considered such strategic business model risks from both an upside and downside perspective. Whereas their work focused on risk as the starting point for business model innovation, we highlight the importance of incorporating such risks into the organization's strategic planning process and addressing them via relevant people and SRM practices.

This article first explores the challenges many organizations experience when using traditional risk management systems to cope with uncertainty in today's changing business reality. We then advocate the development of an enhanced risk management capability that enables companies to overcome these issues. We integrate risk management with strategy formulation along different capability dimensions (i.e., processes, people, practices). More specifically, we provide case-based evidence and practical insights into how companies can develop an SRM capability. We conclude with a list of recommendations for senior executives to put these ideas into action.

2. The challenges of risk management

Whereas traditional risk management narrowly focuses on insurance, financial, and compliance risks, enterprise risk management (ERM) is an enhanced approach that takes a company-wide perspective and aims to incorporate both strategic and traditional risks. ERM, however, is a relatively recent practice and has yet to be fully implemented in many organizations (Fraser & Simkins, 2016). Despite the rhetoric about the importance of adopting a strategic perspective in ERM, surveys about actual business practices indicate that companies'

attempts to identify and manage strategic risks within an ERM framework are still quite limited. A study from the Economist Intelligence Unit concluded that "strategic risk management remains an immature activity in many companies" (Scott, 2010).

We identified several reasons why companies may be insufficiently prepared for deep uncertainty despite extensive investment in an elaborate risk management infrastructure. ERM is commonly defined as a "process . . . designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives" (COSO, 2004). From this definition, it is clear that risk management is geared toward strategy execution, while it remains largely silent on strategy formulation.[1] Along the same lines, Fraser and Simkins (2016) described how ERM and risk-based resource allocation contribute to the achievement of a company's strategic objectives by identifying, assessing, and mitigating the factors that jeopardize value maximization. In our case study work with practitioners, only a limited number of companies indicated that their risk management people are formally involved in strategy formulation and strategic decision making. This observation was also reflected in a recent practitioner survey in which respondents saw their firm's integration of its risk management processes with strategic planning as one of its biggest weaknesses (Beasley, Branson, & Hancock, 2017). This evidence shows that traditional risk management is mainly oriented toward strategy implementation as opposed to strategy formulation. Risk management has traditionally focused on protection against downside risks while paying little attention to strategic opportunities or upsides. This one-sided perspective is problematic in responding adequately to strategic risks because it overlooks an important source of value creation.

In addition, the detailed and heavy process that characterizes many firms' risk management systems creates an administrative burden and potential inertia toward managing risk and opportunity (Fraser & Simkins, 2016). For example, in the financial sector, the typical banking risks are analyzed and reported in extreme detail, while newly emerging competition from fintech startups, digital giants, and the rise of blockchain technology may largely remain blind spots. Some of our interviewees indeed mentioned that an elaborate risk management system might provide their companies with a false sense of security.

Furthermore, the complexity and interdependence of emerging risks across functional domains, organizations, and countries make it difficult to properly manage them. The combination of complex and interdependent risks led to a perfect storm in the financial sector due to major blind spots in financial institutions' risk management (e.g., overleveraging by consumers and businesses, the collapse of the housing market, and the seizing up of credit markets). Consider how new digital business models (e.g., Airbnb, LinkedIn, Spotify) rendered incumbents' existing value chains, core assets, legal framework, and customer relationships largely irrelevant. Traditional risk management is ill-suited to manage such strategic risks given its mostly function-oriented, silo-based approach in which risks (e.g., IT, legal, and competitive risks) are addressed separately (Beasley & Frigo, 2010).

In summary, companies face several challenges when relying on traditional risk management systems to help identify, assess, and respond to strategic risks. In the next section, we present an alternative approach that extends beyond the classic boundaries of risk management and takes a dynamic, forward-looking perspective.

3. Strategic risk management as the solution

To strengthen an organization's resilience and agility in today's turbulent times, a more strategic approach to risk management is needed. We present SRM as an organizational capability to manage deep uncertainty in the context of strategy formulation. Whereas prior literature has advocated a link between risk management and strategy formulation (Beasley & Frigo, 2010; Frigo & Anderson, 2011), this article represents one of the early endeavors to develop a framework for how to achieve this integration. The approach to SRM described in this article is derived from our qualitative field research at several European-based companies active in a variety of sectors, including technology (ScienceCo), telecom (TelCo), financial services (BankCo and InsurCo), transportation (TransCo), chemicals (ChemCo), energy (EnerCo), IT (ITCo), and healthcare

[1] A recent update to the COSO framework highlights the importance of considering risk in both the strategy setting process and in driving performance. However, the emphasis is still very much on better preparing organizations for the risks that come from executing the company strategy (COSO, 2017).

(HealthCo, PharmaCo).[2] In all case companies, the SRM approach adopted—irrespective of the specific type of approach—was the result of a conscious, top management decision.

3.1. Toward an enhanced risk management capability

SRM involves the development of processes, people, and practices toward identifying, assessing, and responding to strategic risks with the ultimate goal of protecting and creating shareholder value (Frigo & Anderson, 2011). Instead of treating risk management purely as a compliance issue, SRM recognizes it as complementary to strategy in envisioning risks (Kaplan & Mikes, 2012). It incorporates a company's strategic actions regarding both downside risks and untapped opportunities for value creation. Sample SRM practices observed at our case companies include environmental scanning, scenario planning, organizing joint risk and strategy forums for senior leaders, allocating dedicated resources to disruptive innovation, and nurturing a culture of risk-awareness across the organization.

Research has shown that companies create value from managing strategic risks better than their competitors (Girotra & Netessine, 2011). Organizations that primarily focus on minimizing risks within budget or reducing the total cost of risks tend to have higher stock price volatility and achieve lower firm value than those that have taken steps to holistically consider both the upsides and downsides of risk (Ittner & Keusch, 2017). All of our case companies practicing SRM displayed a high degree of strategic agility in that each one of them transformed itself adequately in response to important changes in their environment. However, it is also important to note that the value of SRM lies not so much in the output of the efforts (e.g., the outcome of the risk assessment or the exact description of particular disruptive scenarios) but in the organizational interactions during the SRM process. A top executive at ChemCo stated that having high-quality strategic risk discussions was more important than the outcome of the discussions itself. The richness of the risk dialog contributes to increased uncertainty awareness and the embeddedness of risk knowledge in a firm's strategy development.

3.2. How SRM differs from traditional risk management

SRM includes an organization's capability—in terms of processes, people, and practices—to identify, assess, and respond to deep uncertainty in the pursuit of enterprise value. As discussed above, it clearly differs from the more traditional approach to risk management. Table 1 lists six key differences, which we describe below.

1. *Content*. Instead of focusing on preventable and known risks (e.g., related to operations, reporting, and compliance) or strategy-related risks (e.g., market risks taken to achieve superior return), SRM identifies and manages deep uncertainty, the so-called unknown unknowns. The level of uncertainty has increased dramatically for most companies as the global economy has become more integrated, allowing the transmission of shocks and the opening of opportunities to businesses anywhere (Teece et al., 2016). SRM is designed to address such environmental dynamism.

2. *Strategic orientation*. As discussed above, risk management is traditionally oriented toward strategy execution and treats the company's strategic objectives as a given. In contrast, SRM strives for a strong link between risk and strategy by explicitly linking risk management to the strategy formulation process (Beasley & Frigo, 2010). For example, top management at TelCo developed a list of risks and key strategic questions as input for a risk-based strategic plan to be discussed with and approved by its board of directors.

3. *Process*. The development of a risk-enabled strategic plan through an appropriate SRM capability occurs in cocreation across different functions and different layers of the organization (and even external partners), whereas traditional risk management is typically exercised through top-down strategic guidelines and directives. BankCo engages both its top management and young high potentials to discuss possible strategic risks, whereas ITCo uses its startup portal and customer sounding boards to co-create part of its strategic risk discussion.

4. *Sequencing*. While the traditional risk management approach is driven by a rather rigid,

[2] We conducted in-depth, face-to-face interviews with C-level executives (CEO, CFO, Chief Risk Officer, and Chief Strategy Officer) at the case companies using a semi-structured interview protocol. The interviews took place over a 12-month period in the 2016—2017 timeframe, and each lasted from 1.5 to 2 hours. We took extensive notes and transcribed the complete interview before performing the within-case and cross-case analyses. Company names have been disguised for confidentiality reasons.

Table 1. Differences between traditional and strategic risk management

Dimension	Traditional risk management	Strategic risk management
Content	Risk	(Deep) uncertainty
Strategic orientation	Strategy execution	Strategy development
Process	Top-down	Co-creation
Sequencing	Calendar-driven	Issue-driven
Time perspective	Reactive	Proactive
Risk leadership	Functional, silo-based	Cross-functional, shared

calendar-driven process, SRM's activities involve more flexible, issue-driven strategic exercises, such as ad-hoc analyses and responses to new business models as well as scheduled scenario planning and stress-testing exercises on specific strategic topics. Most of our case companies reported intensive use of such SRM practices. Whereas some companies, such as EnerCo and TransCo, considered it sufficient to conduct a one-off scenario planning exercise, others like ChemCo performed it yearly as part of their regular strategy formulation process.

5. *Time perspective*. The perspective of traditional risk management is predominantly reactive toward events that threaten the achievement of strategic objectives laid out in the strategic plan. In contrast, the SRM viewpoint is proactive in terms of developing a strategic plan that anticipates potential strategic risks the organization might face. For example, InsurCo stimulates a proactive confrontation between the risk management and strategy functions at several times during the year during which key strategic risks, different scenarios and stress tests, and potential response strategies are being discussed.

6. *Risk leadership*. Too often, the traditional risk management approach suffers from a functional, silo-based approach wherein risks are managed in isolation by business unit leaders with minimal oversight or communication related to other risks (Frigo & Anderson, 2011). Instead, SRM considers the interactive effects of various strategic events in balancing a firm's portfolio of risks within its risk appetite while also aligning risk management processes across the organization. For example, some case companies such as HealthCo applied not only a decentralized and functional approach to risk management but also—when appropriate—a shared and holistic approach. This can include scanning uncertainties across several functional domains, including technology, legal, and competition.

4. Integrating risk management with strategy development

Central to SRM is the link between risk management and strategy formulation. Kaplan and Mikes (2012) advocated that both strategy risks (inherent in a firm's strategic choices) and external risks (emerging from disruptive changes in the external environment) need to be taken into account during the strategic planning process. They proposed relevant practices (e.g., war gaming and scenario planning) and the generic role of the risk management function (e.g., being a devil's advocate). Our article provides more in-depth insights into how companies apply different approaches to incorporating strategic risk into their strategy process. We distinguish three mechanisms that help organizations integrate risk and strategy when practicing SRM—processes, people, and practices.

4.1. Processes

Embedding risk into the strategic planning and review process allows companies to evaluate whether the planned strategic initiatives collectively support their strategic objectives and whether the combined risks fall within the organization's risk appetite. Based on our research, we conceptualized two dimensions along which the risk management process can be linked with the strategic planning and review process—content integration and timing integration.

The *content integration* dimension is the extent to which core risk-related content is incorporated into strategy formulation. On the high end of the spectrum, risk management content is fully integrated with strategy content when management explicitly focuses on the exploration of future risks during the strategy formulation process. At TelCo, input on the different risk categories identified during the ERM process was provided to the strategy development process at the start of the strategic planning cycle in May/June. In September, the results from the ERM questionnaire served as an acid test for the strategic plan developed up to that point.

In contrast, risk management core content can remain completely separate from strategy formulation (e.g., when new strategy formulation does not include any major considerations about future or emerging risks). At ChemCo, the risk process was disconnected from strategy and only looked at the downside operational risks (e.g., transport accidents), not the upside potential from strategic opportunities in the customer value chain (e.g., increased demand for a certain type of chemical technology used in smartphones).[3]

The *timing integration* dimension involves how the risk management process is connected with the strategy formulation process timing-wise. The risk management process can be sequentially linked with strategy formulation. At BankCo, risk management and strategic planning only came together after the strategic initiatives were developed. It was a conscious management decision to keep the two processes sequential in order to keep risk management from restraining strategic initiatives. Whereas risk managers were not always perceived as good at evaluating new strategic initiatives because they were not in the business, they were considered very useful in helping to safeguard the long-term vision of the business.

Alternatively, risk management can run simultaneously with strategy development in which case the company synchronizes its risk management process with the timing of the strategy formulation process. At InsurCo, SRM was supported by a calendar-driven process designed to completely align the risk management and strategy processes. For example, the results of both the risk assessment and the strategic review were integrated in the company's midyear review process. Figure 1 shows how our case study companies score on both content and timing integration between risk management and strategy development.[4]

[3] Beside the process dimension (related to the content and timing integration between risk management and strategy formulation), dedicated people (e.g., risk experts) and company practices (e.g., annual scenario planning exercises) are integral elements of an organization's SRM approach. Consequently, it is possible for an organization to employ an SRM capability to identify, assess, and respond to strategic risks without necessarily having content alignment between their risk management and strategy formulation processes. In that case, the SRM capability is likely to shift to the strategic planning process.

[4] As part of our research, we developed a diagnostic tool comprised of 8 questions to assess an organization's level of content and timing integration between risk and strategy. By scoring each question on a 7-point Likert scale and calculating the total composite score, organizational members can determine their company's process integration type. The scoring instrument is included in the Appendix.

4.2. People

In our case companies, SRM was established as an enhanced capability within the existing risk and/or strategy functions. In some organizations, the responsibility for triggering the SRM discussion resides entirely within the corporate strategy function whereas others see it as a shared responsibility between the risk management and strategy department, each with their own analyses and reporting systems. In the former situation, the risk function operates independently from the strategic planning unit while, in the latter, we observed varying levels of interaction between the two. For example, TransCo formally embedded its risk management people in the strategic management unit. In contrast, ScienceCo's risk function was only tangentially involved in the strategy process; its experience showed that risk managers were not able to estimate the situation well because they were not fully embedded in the business. Figure 2 shows our framework with the three different combinations of process integration and the role of the risk management function with regard to SRM.

First, firms that score low on both content and timing integration address strategic risks within the strategy process and view the role of the risk management function predominantly as protecting the core business. Senior business leaders, supported by the corporate strategy department, take full ownership of SRM. These firms' risk management processes and people focus mainly on flawless execution to ensure that their business models run with operational excellence and are protected against compliance and execution risks. Because the risk management people develop their skills primarily in relation to strategy execution and the optimal use of operational assets, they are typically not involved in discussions about the strategic consequences of deep uncertainty. For example, at ScienceCo, the risk management department remained on the sidelines during strategy development. It was only consulted after the strategy had been developed to check whether there were any compliance issues or discrepancies with the intended strategic direction and the risk management practices in place.

Second, firms that score low on timing integration but high on content integration consider the role of the risk function as a strategic challenger. They include the risk function in strategy formulation at discrete points in time as they need additional information, often due to rapid technology and market changes. The risk management process is sequentially linked with the strategy formulation process, mostly for standby expert advice. At

BUSHOR-1489; No. of Pages 11
ARTICLE IN PRESS

Figure 1. Content and timing integration across the case companies

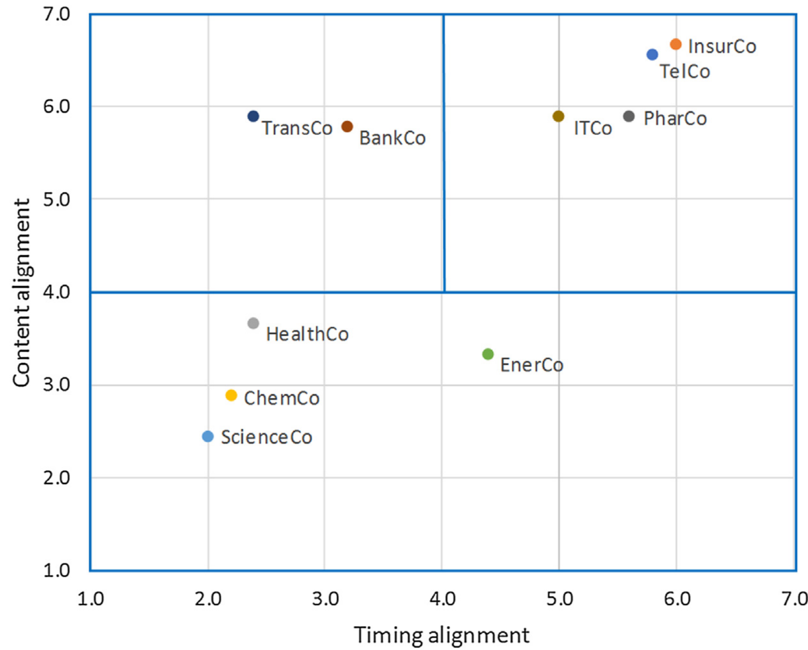

Figure 2. Integration of risk management and strategy formulation

Content: to what extent is risk content incorporated into the strategy process?	*Integrated*	II Strategic challenger	III Business partner
	Separate	I Protecting the core business	
		Sequential	*Simultaneous*
		Timing: how is the risk management process related to the strategy process timing-wise?	

TransCo, although the risk department was not actively involved in the strategic exercise, the board of directors and the risk manager jointly and regularly identified, analyzed, and assessed key strategic and tactical risks. The company used a bottom-up, emergent model of strategy development that used the input from risk management as a starting point for the strategy development process. The strategic roadmaps incorporated information that was picked up and assessed by the risk management team during the months prior to the creation of the new strategy. The concern that the increased rigor of embedding risk analyses into strategy development might have a negative impact on the efficiency and responsiveness of the strategy formulation process leads these companies to involve risk management sequentially rather than simultaneously.

Third, firms that score high on both content and timing integration view the role of risk management as a business partner. They consider the risk function as essential in terms of creating value. Risk analyses are actively included in strategy development, and the timing of both processes is closely synchronized. The company culture embraces risk, and there is a high level of risk awareness. There may be some tension between process rigor and efficiency, but the overall perception is that the process of having joint strategy and risk management exercises significantly enhances the quality of

the outcomes. The integration of the ERM cycle with the strategic planning process at TelCo culminated in an assessment of the coverage and potential blind spots in the strategic plan in terms of risks that had emerged in recent years. The resulting adjustments were then used as input for the next iteration of the strategic plan. At InsurCo, embedding risk management in the strategic planning cycle became standard practice. The company had thorough processes in place in which dedicated teams (i.e., corporate strategy team and risk management team) worked on the development of the group strategy and risk management, as well as on their interaction. The strategic planning process and the risk management process operated in parallel, but with considerable integration between the two. The integration between risk and strategy was not the formal responsibility of a single individual or team but the result of the way the processes were designed, in which every person, department, and operating company played a specific, challenging role.

Apart from organizing the risk function of SRM, firms striving for the integration of risk and strategy development also shape the company culture to become more risk aware and collaborative. For example, InsurCo emphasizes a culture of putting influence before hierarchy by assigning important responsibilities to local entities that are closest to the business. At the same time, it fosters a risk-embracing climate within the organization that fights risk complacency (i.e., the attitude that once a strategic risk has been identified, it has also been solved). At BankCo, there was a strong push for an agile way of working and change agents were spread across the organization to promote a culture of nonfinancial risk awareness and mitigation. PharmaCo advocated a shared sense of purpose that drove employee engagement—combined with high accountability for strategic risks—so that employees were eager to recognize potential disruption themselves and became the first line of defense to identify megatrends in the environment.

4.3. Practices

Our case companies adopted well-developed practices for achieving integration between risk and strategy such as formal process interactions, incentive systems and key performance indicators (KPIs), and targeted reporting. HealthCo employed its IT and data analytics capabilities for continuous competitive and market scanning, as well as information sharing across departments. BankCo installed formal KPIs for market scanning among its employees while HealthCo used the financial incentive system to stimulate a long-term perspective of senior leaders, as the consequences of strategic threats and opportunities sometimes only emerge in the long term. InsurCo used regulation-driven risk reports that were formally exchanged and integrated between the risk, strategy, and business functions in the organization. Just like TelCo, it also organized formal interaction moments between corporate strategy and the risk management people.

An important mechanism for firms to achieve the desired level of integration between risk and strategy is to engage in rich risk dialogs when conducting strategic risk exercises such as scenario planning and war gaming. For example, InsurCo used tools such as trend radar screens, heat maps, and scenario planning to help create risk awareness among employees from various functions and levels in the organization. ChemCo applied disruptive scenario analyses to stimulate strategic discussions between their business units and the executive committee on key strategic risks linked to the value chain. Companies that take SRM seriously thus consider it as a core competency and top management responsibility.

While we observed these SRM practices across all three SRM integration types, the intensity and sophistication of these practices clearly varied with the level of integration. At InsurCo, where both content and timing integration between risk and strategy were high, SRM was supported by a comprehensive, calendar-driven process comprised of five key subprocesses and designed to stimulate interaction between the risk and strategy functions in the company. There was a cascading reporting structure from corporate to operations in which the reports originated from the operating companies (i.e., bottom-up), and all challenging sessions and instruction letters were initiated by the corporate level (i.e., top-down). In addition, all processes were in a continuous state of interaction and every person or department had a specific, challenging role. The results of the risk assessments and the strategic review were integrated in the midyear review; stress tests were the result of this midyear review and these tests were, in turn, designed based on the updates from the key risk reports. This approach stimulated corporate-wide risk awareness and a risk-embracing culture.

Finally, companies experiment with incubation programs that connect with innovative startups in their ecosystem in order to learn about new developments. The format and level of experience with these incubation activities can differ significantly. Some of our case companies were just starting to experiment with this approach (e.g., EnerCo), while others had a tried-and-tested system in place (e.g., ITCo). Whereas some companies applied incubation using an internal virtual venture capital board across business units (TelCo),

others used an open IT platform to connect to startups and customers via idea competitions (ITCo). This way, companies can closely analyze potential strategic risks and quickly respond to both opportunities and threats with relatively low risk exposure. For example, BankCo strived to maintain close partnerships with fintech startups. By offering these companies a spot in BankCo's incubation program, BankCo could follow the fintech startups closely with only limited funding. This limited reputation risk for BankCo by attaching its name to relatively unknown small players.

5. Putting the idea into action

In this article, we discussed how companies need to strengthen their SRM capability to adequately address today's dynamic business environment. We conclude with a number of attention points every senior executive should reflect on to assess his or her company's readiness for transformation under deep uncertainty.

5.1. Consider the process

Assess to what extent strategic risk is integrated into the company's strategic planning process and whether and how the timing of the risk management and strategic planning processes are interdependent. One option is to operate with minimal alignment between both processes. In that case, the full SRM capability will have to be taken up by the strategy function in close cooperation with business leaders. The role of the risk function will mostly be limited to compliance and execution-related risk prevention. As an alternative, companies can choose to proactively embed strategic risk foresight into strategy development by carving out tightly integrated risk management and strategic planning processes. Dependent on whether the chronology of the alignment between the risk and strategy process is sequential versus synchronous, the risk function will either act in a strategic advisory capacity or as a full-fledged business partner.

5.2. Consider the people

Assess whether and how the risk function and other management levels in the organization are involved in SRM practices and processes. While in some companies they are only periodically involved in SRM discussions, other organizations focus on continuous engagement of multiple organizational levels and functions for managing strategic risks. The risk function will—in many cases—play a coordinating role in the SRM process, organizing the reporting and facilitating the information exchange around risk across different levels and functions in the organization. It is only in companies with highly integrated processes that both risk and strategy people jointly take the lead both at the corporate and business unit level. Another important element to consider is the need to nurture a culture of risk awareness and shared risk responsibility throughout the organization.

5.3. Develop the practices

Free up the necessary resources to develop relevant practices with respect to identifying, assessing, and responding to strategic risks. Companies need to identify which combination of mechanisms they want to implement to incorporate strategic risk insight and foresight into their strategy formulation. For example, they can choose to regularly conduct scenario planning and war gaming exercises, establish senior executive forums about strategic risks, or set up incubation programs to team up with relevant startups in their industry.

5.4. Align the three building blocks of SRM—process, people, and practices

It does not make sense for an organization to tightly integrate the company's strategy formulation and risk management processes without adopting proper integrating mechanisms or organizing its talent for addressing the integration. Internal consistency in the design and resource allocation with regard to the three building blocks is key to implementing the right SRM configuration.

5.5. Remember, more integration is not always better

Selecting the desired level of integration between risk and strategy involves a trade-off between rigor (i.e., the depth and breadth of the SRM input delivered for strategy development) and efficiency (i.e., the time and cost of aligning the two processes). Executives who favor efficiency over rigor may choose to limit organizational efforts with respect to content and timing integration of the strategy formulation and risk management processes, while they might still involve risk experts in the strategy development process and use SRM practices (e.g., environmental scanning, creating a proper risk culture) for proactively managing deep uncertainty. This decision implies that the SRM capability may shift partially or fully to the strategic planning process. Some of our case

companies adjusted their approach over time; for example, they reduced the level of process integration when it turned out that their risk people were not thinking strategically enough to be involved in the strategic planning process, or they implemented increased integration when it became desirable to incorporate risk content earlier in the strategy-setting process.

5.6. Firms cannot adopt a one-size-fits-all approach to SRM

We observed that case companies, operating in relatively mature and stable industries such as chemicals and energy, put relatively less emphasis on integrating risk management and strategy than companies in industries that are going through a period of rapid technological developments, regulatory change, and shifting customer demands—such as financial services, information technology, and telecommunications. Companies in industries with an increased level of uncertainty and ambiguity have been observed to shift from risk prevention and mitigation to an SRM approach that stimulates increased risk awareness and embraces strategic risk as an opportunity for value creation. Moreover, we noticed that the closer a particular business is to the end customer, the more relevant SRM becomes and there exists a greater pressure toward process integration between risk management and strategy formulation.

5.7. Be aware of the changing need for SRM capabilities

Any firm's context is likely to evolve over time as a result of changes in the environment (e.g., pressure from regulators, customers, technology, and competitors), business model, leadership, etc. Conducting a SRM self-assessment at regular intervals allows for the dynamic adjustment of the level of process integration, people skills, and mix of SRM practices to the new context in order to be fully prepared for the future. In our case examples, we observed that increased uncertainty and ambiguity in the environment went hand in hand with higher levels of integration and involvement of risk management with the strategy process.

We believe the framework and guidelines presented in this article will be of interest to senior executives aiming to transform their company in the face of deep uncertainty and to risk professionals concerned with (re)shaping their role in today's dynamic business environment.

Appendix. Scoring instrument for content and timing integration

Content alignment between risk management and strategy	***How much do you agree with the following statements? (1 Strongly disagree-7 Strongly agree)***
Our senior management explicitly considers the impact of strategic uncertainties during the strategic planning and review process	1 2 3 4 5 6 7
Our company's strategic plan is fully risk-enabled by leveraging a structured risk approach	1 2 3 4 5 6 7
In our company, there is no systematic input from the risk management process in strategy formulation	1 2 3 4 5 6 7
Strategic risk input from our risk management process is included in an ad-hoc manner into the strategy process	1 2 3 4 5 6 7
The risk management process in our company is tightly integrated with our company's strategic planning process	1 2 3 4 5 6 7

Timing alignment between risk management and strategy	***How much do you agree with the following statements? (1 Strongly disagree-7 Strongly agree)***
Risk and strategy operate at different points in time, with no timing overlap between the two process calendars	1 2 3 4 5 6 7
Our company's risk management process and the strategy formulation process operate sequentially—business strategy is set first, risk strategy is defined ex-post	1 2 3 4 5 6 7
Our company's risk management process and strategy formulation process run simultaneously	1 2 3 4 5 6 7

References

Ansoff, H. I. (1980). Strategic issue management. *Strategic Management Journal, 1*(2), 131—148.

Beasley, M. S., Branson, B. C., & Hancock, B. V. (2017, June). *CGMA 2017 global risk oversight report*. Available at https://

www.cgma.org/content/dam/cgma/resources/reports/downloadabledocuments/global-risk-oversight-report.pdf

Beasley, M. S., & Frigo, M. L. (2010). ERM and its role in strategic planning and strategy execution. In J. Fraser & B. Simkins (Eds.), *Enterprise risk management: Today's leading research and best practices for tomorrow's executives* (pp. 31—50). Hoboken, NJ: John Wiley & Sons.

COSO. (2004). *Enterprise risk management — Integrated framework*. Available at https://www.coso.org/Pages/erm-integratedframework.aspx

COSO. (2017). *Enterprise risk management — Integrating with strategy and performance*. Available at https://www.coso.org/Documents/2017-COSO-ERM-Integrating-with-Strategy-and-Performance-Executive-Summary.pdf

Davis, J. P., Eisenhardt, K. M., & Bingham, C. B. (2009). Optimal structure, market dynamism, and the strategy of simple rules. *Administrative Science Quarterly, 54*(3), 413—452.

Doz, Y., & Kosonen, M. (2011). Nokia and strategic agility: A postscript. *California Management Review, 53*(4), 154—156.

Fraser, J. R., & Simkins, B. J. (2016). The challenges of and solutions for implementing enterprise risk management. *Business Horizons, 59*(6), 689—698.

Frigo, M. L., & Anderson, R. J. (2011). Strategic risk management: A foundation for improving enterprise risk management and governance. *Journal of Corporate Accounting and Finance, 22*(3), 81—88.

Girotra, K., & Netessine, S. (2011). How to build risk into your business model: Smart companies design their innovations around managing risk. *Harvard Business Review, 89*(5), 100—105.

Hambrick, D. C. (1982). Environmental scanning and organizational strategy. *Strategic Management Journal, 3*(2), 159—174.

Ittner, C. D., & Keusch, T. (2017). Incorporating risk considerations into planning and control systems. In P. Linsley & M. Woods (Eds.), *The Routledge companion to accounting and risk* (pp. 150—171). London, UK: Routledge.

Kaplan, R. S., & Mikes, A. (2012). Managing risks: A new framework. *Harvard Business Review, 90*(6), 48—60.

Power, M. (2004). The risk management of everything. *The Journal of Risk Finance, 5*(3), 58—65.

Power, M. (2009). The risk management of nothing. *Accounting, Organizations, and Society, 34*(67), 849—855.

Schoemaker, P. J. H. (1995). Scenario planning: A tool for strategic thinking. *MIT Sloan Management Review, 36*(2), 25—40.

Scott, I. (2010, November 18). Fall guys: Risk management in the front line. *Economist Intelligence Unit*. Available at http://www.eiuperspectives.economist.com/strategy-leadership/fall-guys

Stulz, R. (2008). Risk management failures: What are they, and how do they happen? *Journal of Applied Corporate Finance, 20*(4), 39—48.

Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review, 58*(4), 13—35.

Trigeorgis, L., & Reuer, J. J. (2017). Real option theory in strategic management. *Strategic Management Journal, 38*(1), 42—63.