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MATERIAL IMPROBABILITIES

GETTING PRACTICAL WITH EMERGING RISKS

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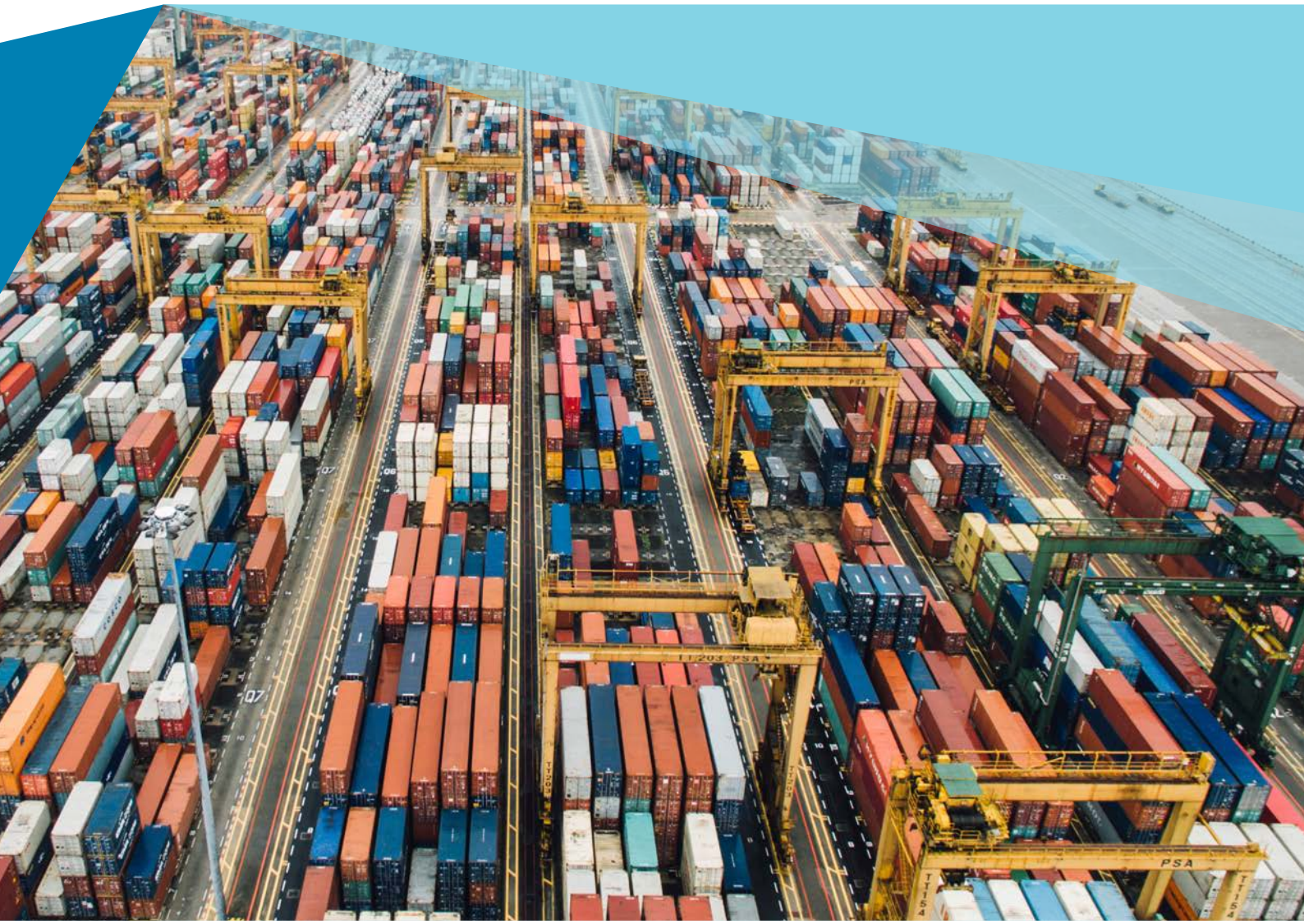

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SEVEN TAKEAWAYS

1 Widespread political volatility and rapid technological advances are **spurring companies to question not just their resilience, but also their fitness for purpose** in the new world order. This requires risk leaders to reflect harder on how their functions can better support organizational agility and strategic change.

2 **An analytical approach that is both creative and pragmatic is essential** for respecting the inherent messiness of complex uncertainties and securing actionable results. A clear view on the role and value of emerging risk analyses within planning, risk mitigation, and crisis preparedness processes will strengthen organizational commitment to the effort.

3 **Risk identification processes need to be explorative and iterative**, sourcing ideas widely and triaging them in a way that both challenges orthodox thinking and also secures senior management buy-in. A thorough characterization of each of the top emerging risks helps clarify their materiality and provides an initial steer for response planning.

4 **Scenarios can give shape to plausible alternative futures**, including possible shock events. A strategic approach to their generation may usefully expose hidden tensions between commercial ambitions and corporate risk appetite. Scenario narratives and quantification exercises for emerging risks shouldn't be constrained by historic data and risk relationships.

5 **Early-warning indicators are vital for engaging senior management** at a time when a variety of response options are available, notwithstanding the likely ambiguity of the intelligence. Modern data-science techniques will add increasing value to manual risk-tracking mechanisms and subsequent reporting.

6 **Management levers that address a range of top-tier emerging risk concerns** may present a more compelling business case than multiple action plans targeting individual issues, especially with regard to pre-emptive responses. Sometimes, aggressive market plays and investment in research and development are more appropriate than defensive mitigation measures.

7 Championing the need to engage with complex uncertainties may **take some risk leaders outside their comfort zone**. But those who can mesh strategic vision, influencing skills, and technological fluency on top of their core risk-management expertise will be best positioned to help their firms negotiate dynamic risk environments laden with potential shocks and disruption.

CONTENTS

INTRODUCTION

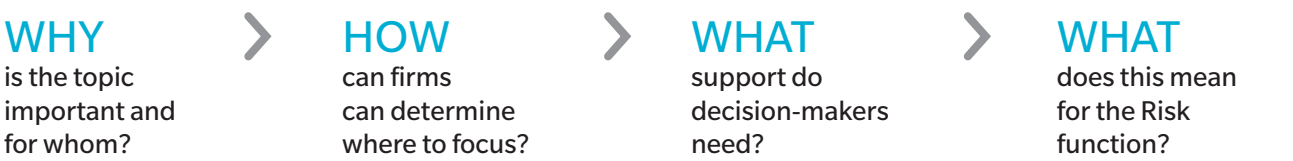
Companies need to rebalance their risk management effort between the risks they can easily specify and the uncertainties that are more elusive, and then engage with the latter in a more dynamic and rigorous way.

We first articulated our thinking on this topic in early 2016. *The Emerging Risks Quandary* set out why companies large and small needed to more effectively anticipate threats that, although complex, are often hidden in plain sight. The paper identified a range of analytical and institutional inhibitors to action, and then set out where firms could do better: diagnosing emerging threats, evaluating their potential impact, and integrating analyses in business processes.

As lurches in the macro-level risk landscape have injected still greater urgency into this topic, we have revisited those issues to spell out in detail key approaches and techniques. Our purpose is to offer business and functional leaders some creative and pragmatic steps that can help strengthen the evidence base for action and build senior management buy-in at critical junctures. Whether fully integrated or part of a distinct endeavor, these measures will reinforce enterprise risk management frameworks and deliver strategic value. They can be implemented with a light touch or greater rigor as capabilities permit, with processes adapted to institutional preferences.

The report is divided into four parts (see Exhibit 1). Section One lays out the key types of emerging risk and the corporate functions that would benefit most from better intelligence and analysis. Section Two discusses how to move thinking from general concerns to defined risks that are demonstrable threats to the firm. Section Three explores how to build a platform for action through analyzing risk scenarios, evaluating response options, and shaping senior-level discussions. The short concluding section identifies seven initiatives for risk leaders that will help underpin the recommendations in the paper and ensure that company efforts to address critical uncertainties do not founder on the rocks of exigency and expediency.

Exhibit 1: Report flow



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TRANSFIXED BY UNCERTAINTY

Widespread political volatility and rapid technological advances are spurring companies to question not just their resilience, but also their fitness for purpose in the new world order. A failure to anticipate possible shocks and disruptions could see firms experiencing nasty surprises and the needless erosion of long-term value.

TRACING THE CRISIS OF CONFIDENCE

The financial crisis of 2008 and subsequent recession gave rise to three main challenges and associated risks: first, maintaining liquidity to meet obligations and stay afloat at a time of weak markets and counterparties; second, ensuring robust operations as cost-cutting measures put pressure on personnel and processes; and third, aligning investment and hiring programs with the anticipated economic recovery to optimize market positioning. (The financial sector had additionally to cope with the changing shape and obligations of new regulatory regimes.)

Roll forward the best part of a decade and the dominant features of the risk landscape for companies have changed. Even though economic growth has continued to be anemic in advanced economies and volatile in many emerging markets, political sea changes and major technology developments now form the basis of strategic uncertainties. New governmental mandates are introducing obstacles to international investment, trade, and the mobility of talent; further social instability looms in some countries, while geopolitical disagreements are adding friction to international economic relations. The adoption of technological innovation (especially the new wave of automation opportunities) is giving rise new exposures, liabilities, and revenue threats; in some sectors, the disintermediation of value chains and blurring of industry boundaries are beginning to reshape the future competitive landscape.

By opening up a spectrum of possible trajectories and outcomes, the current febrile political environment and the burgeoning "fourth industrial revolution" are exposing new fault lines between firms' risk appetite and their strategic ambitions. Staying out of (or exiting) certain markets for fear of a political crisis might prove expensive, not least if competitors are more bullish; likewise, the pressure for adopting new technologies is intense, even where near-term performance benefits

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The current febrile political environment and the burgeoning "fourth industrial revolution" are exposing new fault lines between firms' risk appetite and their strategic ambitions.

are uncertain and longer-term ecosystem effects unclear. Historical data is of limited value in quantifying possible impacts, and experts often prove unreliable guides. Over the past two years, economists have faced particular criticism for adhering to base case views and failing to appreciate political factors; political advisers have had their fingers burned by election predictions that have not come to pass; and technology gurus vary wildly from doom-laden scaremongers, to cheerleaders and salespeople.

If financial resilience was the major corporate concern during and after the financial crisis, the key issue these days is market positioning. If back then the buzzwords for risk management were prudence and controls, now they are agility and business case support. Since the crisis, efforts to enhance risk management have largely focused on strengthening risk frameworks and processes. Many companies have sought to tighten risk assessment work, reinforce oversight arrangements, and improve monitoring and reporting practices. This works well for familiar, stable risks that lend themselves to integration relatively easily; but more amorphous, complex risks are not so obliging.

Risk teams should devote more resources to grappling with emerging threats. This doesn't mean tasking them with predicting the future, but the effort does call for significantly more than the generic identification of long-range concerns. It is primarily about supporting senior management decisions by framing and producing analyses that spotlight and put shape to key uncertainties in a way that illuminates them rather than reduces them. Often it means challenging assumptions – recognizing not just that new risks are appearing on the horizon but that operational risks may become strategic risks, known risks may become unknown risks, controllable risks may become uncontrollable, and risks assumed to be acceptable may acquire "fat tails." It also means appreciating the speed of change, the scale of the potential impacts, and the time frames required for building preparedness and resilience.

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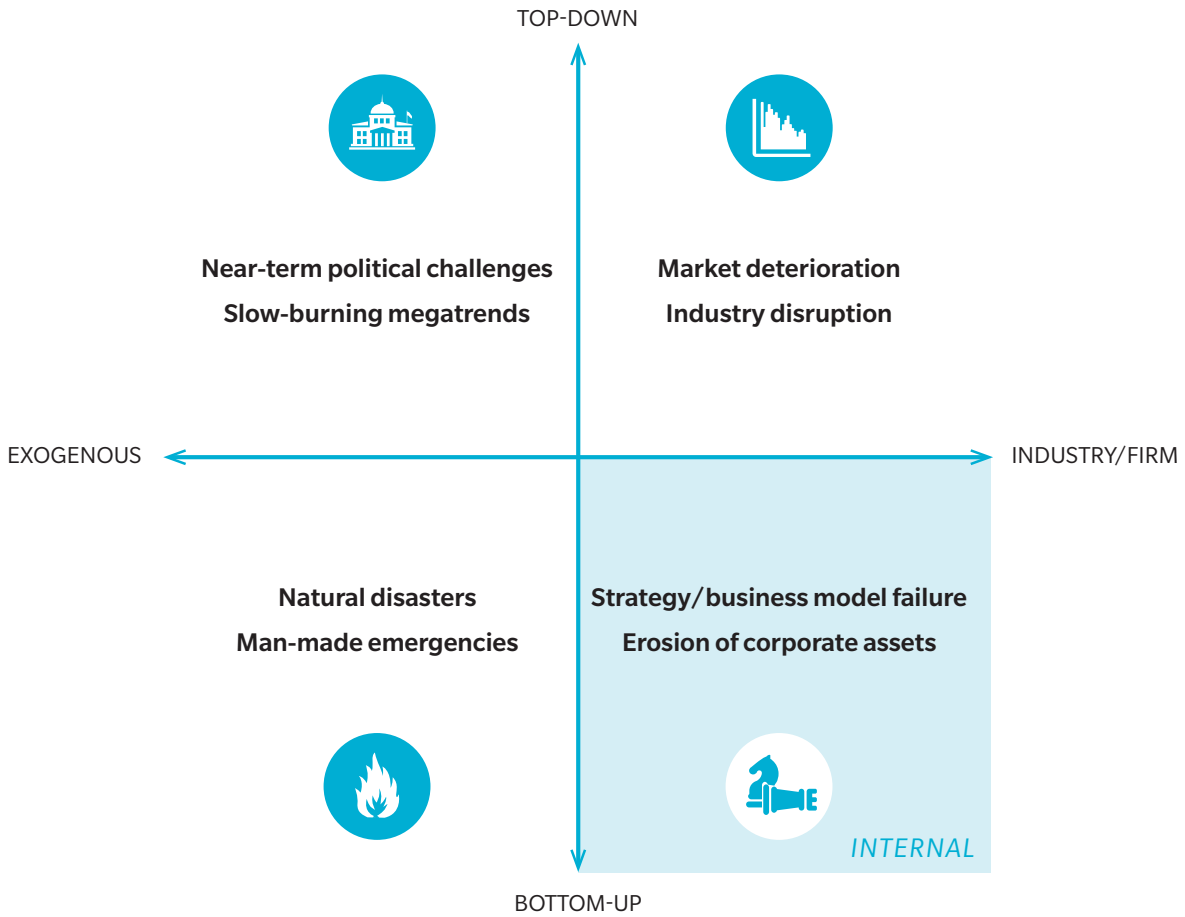
UNPACKING THE PROBLEM

By referring to the unknowability, changeability, and uncontrollability of emerging risks, many company definitions allude to the breadth of the risk management challenge. Against this backdrop, determining the universe and typology of emerging risks is a vital first step in coming to decisions on analysis and treatment.

There are perhaps four different sources of emerging risks, three of which are external to the firm (see Exhibit 2). Companies tend to focus on the emerging threats associated with the **business environment** – the traditional challenges of possible market deterioration and the evolving dangers of industry disruption. Here, materiality appears clearest, due to shifts in customer demand and the competitive landscape. But other types of exogenous risk, such as **macro-level trends**, are also important. Top of mind in late-2017 is the pressure from near-term political challenges, as fragile economies and strong populist agenda stimulate greater government interventionism and elevated levels of cross-border friction. A different type of risk context is provided by slow-burning megatrends (such as demographic shifts, climate change impacts, and global economic power transitions), which, notwithstanding their apparently glacial pace, can erupt into crises and spur far-reaching responses. It is also important to anticipate **perennial**

Exhibit 2: Sources of emerging risks – external and internal



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contingencies in the form of natural disasters and manmade emergencies. While most of these take the form of sudden-onset events that come with little warning (rather than being truly emerging risks), it is useful to keep them within scope and understand the conditions for greater frequency and severity.

Emerging risks also arise from **internal factors**, irrespective of, although sometimes aggravated by, external challenges. Some of these stem from the leadership of the company and strategy or business model failures, and may include vulnerabilities resulting from issues such as over-ambition, the pursuit of off-strategy ventures, inadequate investment, post-merger integration failures, and supply-chain concentration. Other risks arise from the eroding quality of corporate assets, ranging from infrastructure and technology deficiencies at one end of the spectrum, to a weakening talent base and corporate culture at the other. These shortcomings are often more apparent at times of stress from other sources, giving rise to operational malfunctions and lapses, unethical or illegal activities, teamwork failures, and retention issues.

These emerging risks are often as different from each other as they are from more stable, known risks. They might be novel – wholly new to the world or simply new to the region or industry in question. Artificial intelligence is one such topic. Or they might be reawakened – a reasonably familiar threat, dormant for a long time but now back on the radar, possibly in a new form. They might indeed be emerging – early indicators of a threat are visible, but the full dimensions are unclear. Or just evolving – the risk is present already, but it is changing in reach and complexity. Cyber risk is an obvious example here. They might also be familiar challenges that are aggravated by changing external conditions (such as economic protectionism) or more consequential due to changes in the firm's current business portfolio or strategic ambitions, or because operational adjustments and financial developments may have diminished inherent resilience. For instance, technological advances and political confrontations have amplified the potential damage from undesirable insider behavior, whether malicious or non-malicious, witting or unwitting.

While some emerging risks may already have begun to materialize, others may never crystallize at all. Some risks may swell rapidly to produce near-term shocks; others may erode revenues on a steady basis over time. They often appear to develop in a non-linear manner and respond to tipping points that might be detectable only in retrospect. They may be second- or third-order consequences of more visible challenges or they may in themselves trigger systemic impacts that can reverberate through and across industries.

So where do these risks fit within company risk maps? Some firms consciously distinguish squarely present threats from macro-level uncertainties that would probably take more than a year to crystallize; others opt for one holistic inventory. This is sometimes contingent on the mandate of the Risk function, but companies should review what might work best for them. A separate approach has the benefit of highlighting key emerging-risk topics that are relevant for senior management. In doing so, it forces more detailed thinking on the characteristics of prioritized threats and encourages regular updates. Analyses may be disregarded, however, if sponsorship is weak, the effort is fitful, and findings conflict with data on directly pressing risks.

Arguments for combining emerging and core risks rest on the value of a single risk inventory with a single taxonomy. In this instance, emerging risks may feature as drivers or amplifiers of core risks rather than as stand-alone items. This can make for a messy relationship between the two types of risk, and the temptation over time is to ignore the complex and hard-to-quantify emerging aspects that produce apparently outlandish results. Simply earmarking certain risks as "changeable" rarely galvanizes a desirable level of attention and can lead to significant risk drivers and sources of risk being overlooked.

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CONNECTING WITH CORPORATE AGENDA

As our earlier publication noted, the primary reason for investing in the analysis of global and emerging risks is to strengthen strategic, financial, and operational resilience. This is vital both for large companies with complex footprints, business lines, and supply chains, and also for smaller firms, which increasingly face similar challenges. Thoughtful analysis and integration within corporate decision processes may additionally help firms harness any potential upside arising from sharp changes in the business environment (see Exhibit 3).

Five use cases for the outputs indicate how to secure the most value from analyses.

1. **Frame or test strategy and medium-term planning.** Views on emerging risks and uncertainties in the future business landscape can act either as an up-front contextual frame for strategy development or as a means of challenging assumptions that underpin the achievability of corporate ambitions. This is equally applicable for large-scale investments, including acquisitions. The Strategy and Financial Planning & Analysis teams are key stakeholders, as they prepare to interact with business unit leaders and the executive committee.

Exhibit 3: Purposes of emerging risks work and key corporate stakeholders

GOAL	Frame or test **strategy** and medium-term planning, also major transactions and investments	Stress-test corporate **financial resilience** and the likely effectiveness of risk mitigation measures	Rehearse **crisis management** preparedness and the interaction of participants	Explore **pressure points** on personnel, processes and systems involved in implementing major initiatives	Exercise **effective governance oversight** mindful of critical threats to corporate value over the short and long term
ULTIMATE USERS	Business units Strategy, FP&A	Finance Treasury	External relations Senior management	Business units/lines Relevant functions	Boards of directors

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2. **Stress-test corporate financial resilience.** Understanding the damage that might result from possible shock events or developments is useful for identifying the circumstances under which risk appetite thresholds might be breached, the effectiveness of current mitigation measures, and the cost-benefit trade-offs of alternative actions. The Finance and Treasury teams are the key interested parties here, with interest from business unit leaders and the executive committee growing in line with the gravity of the risk and the scale of associated response options.
3. **Rehearse crisis-management preparedness.** Surprises based on emerging risks, knock-on consequences, and the independent actions of affected and unaffected parties can form the substance of challenging fire drills. External Relations is a key stakeholder for the testing of senior management responses, with other functions also interested, depending on the nature of the exercise.
4. **Explore pressure points on personnel, processes, and systems.** Emerging risks are a good way to examine the resilience of operational performance. Tests can be applied both to business-as-usual execution across a wide range of processes and also, more specifically, to the implementation of major new initiatives, which could be compromised by unexpected occurrences and trigger collateral damage for connected activities. Functional and business leaders interested in strong, reliable execution are the key stakeholders.
5. **Exercise effective governance oversight.** Regular intelligence updates on emerging risks, their relevance for the business, and the response measures being undertaken help boards of directors carry out their oversight responsibilities and act as useful inputs for high-level decision making.

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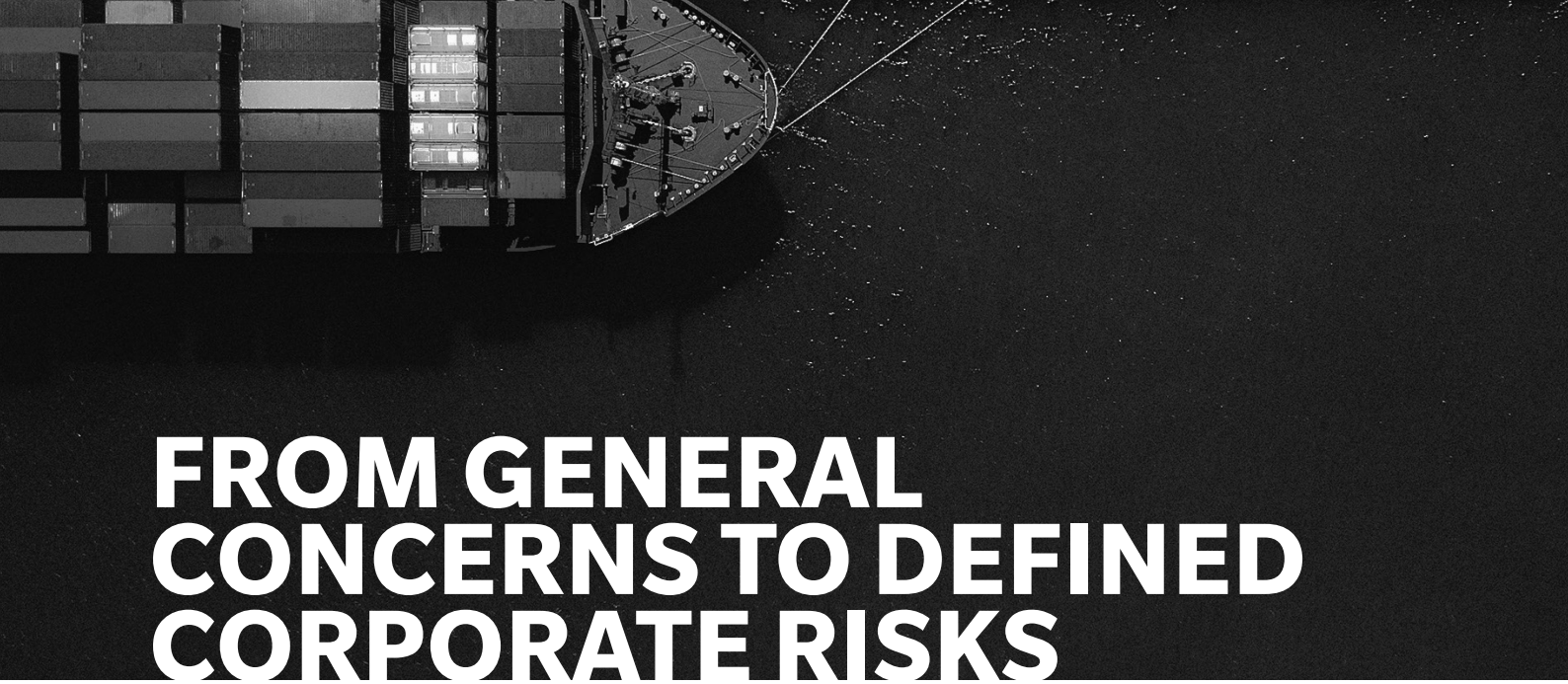

FROM GENERAL CONCERNS TO DEFINED CORPORATE RISKS

It is easy to be overwhelmed by the morass of potential threats to company goals. Structured approaches that facilitate rigorous, creative thinking and different perspectives are vital for energizing the risk identification process and delivering results that can be used in different ways.

ALIGNING ON PRIORITIES

Producing an inventory of material emerging risks requires both divergent and convergent thinking: on the one hand, thoughtful research and wide-ranging consultation; on the other, an effective mechanism for triaging issues and aligning on top concerns. Strong, unconventional ideas and connections must be surfaced and possible touch points to the business captured. Companies that simply go through the motions often end up showcasing either familiar risks that can be matched with routine mitigations or high-level issues against which it is hard to set meaningful responses.

Organizing the idea generation process around a set of fundamental questions can moderate the urge to adhere to obvious issues.

- **What are the hot topics characterizing the world now and which ones, as a result of mutation and aggravation, may be the source of future shocks?** [For example, US-China friction or the evolving cyber-threat landscape]
- **What are the fundamental trends or forces that may gradually threaten the firm's future positioning, growth, and profitability?** [For example, the increasing deployment of artificial intelligence techniques or the rise in economic protectionism]
- **Where do we see potential volatility or uncertainty in our business ecosystem?** [For example, relating to customer behavior, suppliers, policymakers, regulators, and new competitors]
- **Which parts of our asset base, revenue profile, financial positioning, and workforce are most exposed? [**For example, our production facilities in South-East Asia or our long-held cost advantage around distribution**]**

Five sourcing principles may be helpful (see Exhibit 4). First, triangulate a wide array of political, geographic, and institutional perspectives – being consciously sensitive to blind spots and vested interests and not privileging sources that reflect the prevailing corporate

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Exhibit 4: Sourcing principles for emerging risk identification

view. Second, don't close down or dismiss trends and possible risk topics too early – they may combine with other ideas and be useful later. Third, don't worry at this stage about the technicalities of whether something is a risk, a driver, or a consequence – that can be resolved in due course. Fourth, seek to challenge "house truths" by getting internal views from different levels and locations in the firm – from senior management, to the front line. Fifth, don't let discussions be constrained by probability ("the chances of that happening are tiny") – using "what-if" questions encourages interlocutors to make connections between risks and consider knock-on consequences. A "red team" mentality or challenge function can sharpen creative thinking (see the pages on "Emerging Risk Identification and Triage" for details).

To begin the convergence process, first re-cluster the issues so they feel more relevant as emerging risks for the firm. This may lead to a new or refreshed taxonomy for emerging risks and an initial attempt at prioritization based on assumptions about materiality. At this point, it is useful to secure buy-in from business and functional representatives on the thinking to date. Where alignment is tricky, a variant on the Delphi consultation method (an iterative questionnaire-based process – see the following pages for details) can be helpful.

The outcome of the consultation process forms a platform for a more detailed characterization of each of the top risks. This is best undertaken by small expert groups that can explore the dynamics of individual risks and assess the potential business impacts. In due course, experts from these groups may come to own the risk for the purpose of periodic updates.

The characterization work may suggest a revised prioritization of the risks, at which point the framework is ready for discussion and validation by the executive committee and the board. Not only does this final step secure senior-level buy-in, it also provides an opportunity to assign senior-level owners for the most important risks, who then become accountable for the seriousness with which the risk is treated and the strength of the corporate response.

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EMERGING RISK IDENTIFICATION AND TRIAGE

SOURCES OF INTELLIGENCE

Relevant written intelligence can be found in publications from governmental and multilateral institutions; expert bodies, think tanks, and non-governmental organizations; mainstream news and social-media organizations; and private-sector firms such as banks, (re)insurers, and consultancies (general and specialist). Internal company documents may also indicate future vulnerabilities and capability shortfalls. Key sources include (enterprise-wide and business unit) risk inventories and compliance reports; financial reports (showing historic losses, return-on-investment shortfalls, et cetera); operational malfunction logs and project implementation reports; customer and supplier feedback; and legal assessments and reputation trackers.

For non-written intelligence, countless externally hosted conferences and webinars can be attended and discussions held with industry and specific risk experts, as well as customers and suppliers. Internally, senior management interviews will secure top-down perspectives on the drivers of key threats to shareholder value; mid-level workshops involving personnel from different business units and regions will yield front-line perceptions of threats and uncertainties; and discussions with representatives of different functions will generate more synthesized reflections or issue-specific perspectives.

FORESIGHT DEPLOYMENT

Foresight exercises involve rolling forward established and incipient trends to see how they might play out both individually and collectively to influence the future. For the purpose of anticipating emerging risks, it is vital to look beyond the base-case view to consider unexpected variants, often where these trends conspire to generate sudden surges, grind against each other, or become diverted by shock events.

As the horizon of investigation is usually beyond the strategic planning period, foresight is deployed most by firms making long-term investments or managing long-term liabilities. This includes companies locking into the extraction or usage of a particular resource or commodity; infrastructure investors considering the resilience of their assets and the reliability of returns out into the future; and insurance and healthcare companies anticipating unexpected liabilities and long-term market shifts.

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"RED TEAM" ROLE

A "red team" is an independent group mandated to explore critical vulnerabilities to plans, processes, and infrastructure, challenging "blue-team" business assumptions and prevailing opinion. In a military context, it helps interrogate the achievability of declared objectives through the previously identified tactics and resources, often by playing the role of the enemy. This function is refined further in the cyber world where red teams engage in friendly penetration testing of an institution's cyber defenses. In the context of emerging risks, a red team (whether internally or externally constituted) can repeatedly ask hard questions and ensure that good, if unconventional, ideas are not dismissed from the outset.

DELPHI PROCESS ADAPTATION

The Delphi process is a forecasting tool suitable for areas where expert judgment is desirable since historic data points are insufficient for purely analytical extrapolation. Used to reflect on emerging risks, the method involves sending an initial long list of risk issues to a range of selected experts in the form of a questionnaire, expecting anonymous views on prioritization and the rationale for doing so. After the first round, the verdicts and comments are synthesized and packaged to form the next round of the questionnaire, allowing respondents to modify their views based on the results of the previous round. Two or three rounds should suffice before reasonable convergence is achieved or the likely limits of consensus reached. Although the process can be cumbersome and requires a good cohort of experts, the anonymity of participant response encourages greater freedom of response, and the questionnaire basis does not require everyone to be in the same place.

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CHARACTERIZING RISKS THOROUGHLY

The deep uncertainty at the heart of emerging risks makes it impossible to be confident about outcomes, impacts, and associated probabilities. Companies flummoxed by this tend to do one of three things: disregard such risks entirely and hope they don't materialize; loosely include them as business environment challenges in annual reports, Securities and Exchange Commission filings, and strategy reviews; or mark them with fixed assumptions on risk heat maps, in the manner of more predictable risks. The shortcomings of the first two actions are obvious; the third is problematic because a singular positioning fails to reflect alternative permutations and the chosen placement usually denotes the first-order effects of a palatable manifestation rather than the fuller impacts from a more damaging scenario.

Strong risk characterization helps frame issues in such a way that the dimensions of the potential threat can be more objectively examined. The exercise supports an assessment of materiality and provides a strong foundation for considering the appropriate response. It doesn't need to be done with the entire long list of risks, but it's worth doing properly for the top 10 or 20 risks.

A standardized template with two parts (see Exhibit 5) helps ensure analytical consistency across different risks and users. This can be adapted to facilitate the standalone quantification of exceptional risks, where certain components may need to be considered in more detail.

The first section of the template helps **categorize** each risk in a structured way. This involves noting the inherent character of the risk (volatile, uncertain, complex, ambiguous [VUCA] and also emerging or evolving) and its clock speed (the rate at which it might crystallize given the right conditions or trigger). Then taking a view on which parts of the enterprise the risk would affect – which business segments and parts of the world. And the types of impact: viewed narrowly, would it affect revenues, the cost base, personnel safety, the debt repayment plan, et cetera; viewed more broadly, would it damage relationships with customers, suppliers, regulators, and other ecosystem stakeholders? Then analyses should signal whether the risk might erupt in the near term or is more of a longer-term challenge, and whether the damage to the firm might be short-lived or felt for a number of years. And,

Exhibit 5: Characterization template for emerging risks

CATEGORIZATION ("TICK-BOX")

RISK OVERVIEW	Character	Clockspeed
LIKELY TOUCHPOINTS	Locations	Business units
POSSIBLE IMPACT	Internal view	External view
POSSIBLE TIMELINE	To impact	Damage longevity
RESPONSE	Opportunity	Business process

NARRATIVE ("FREE-FORM")

TRAJECTORY	Current situation	Possible outcomes
FACTORS	Drivers/ accelerants	Connections
POSSIBLE CONSEQUENCES	Near-term	Long-term
THREAT CHANGES	Recent	Expected future
RESPONSE	Current activities	Next steps (recommended)

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Strong risk characterization helps frame issues in such a way that the dimensions of the potential threat can be more objectively examined.

finally, it is useful to capture the company's room for maneuver to pre-empt the risk (can it be controlled, mitigated, or transferred, for example), and which business or operational processes (such as capital reallocation, insurance, facilities security) might be the primary means for addressing the threat.

This can be achieved via drop-down menus and survey-style buttons. A pre-defined set of options makes it easier to aggregate information across risks and compare results. For example, knowing that six out the eight top-tier risks would have severe consequences for the firm's business in, say, Southeast Asia might spur stronger risk monitoring in that part of the world. Similarly, if the results showed that a number of key risks were likely to come to a head over a three-to-10 year window, company leaders might wish to explore options as part of the strategy review process. If several leading risks could only be mitigated through major capital expenditure, prioritization or phasing may need to take place.

The second section of the template, focused on **narrative**, is equally structured but requires free-form answers. These help get under the skin of individual risks, the threats they pose for the firm, and what is being done to address them. In the first instance, it's necessary to describe the current situation (recent events and backdrop) and then the possible outcomes that may result, depending on how the risk develops. These outcomes are justified by delineating key drivers, potential accelerants, and tipping points; it is also useful to take a view on any key relationships with other risks. This enables analysts to think through possible consequences for the firm over different time frames, reflecting on possible first- and second-order effects. The longer-term view should recognize that the firm's future exposures or vulnerabilities may change not only in line with the trajectory of the risk but also due to the evolution of the business portfolio and the scale of the mitigation efforts. Then the latest intelligence can be used to note recent changes in the threat level and future expectations. And, finally, this section of the template can capture both current response measures and recommended next steps – ranging from de-prioritization or a watching brief, to proposals for defensive and offensive initiatives.

Some risks can be more easily conceptualized by adopting the perspective of key participants in the company's ecosystem. Analyzing the vulnerability of key customer and supplier groups will often shed new light on the company's own exposures. Moreover, appreciating the different motivations of these and other participants (such as competitors and regulators) may help recalibrate the threats to one's own firm.

With the character of critical emerging risks established, it's now possible to form a more robust view of their materiality and rank their importance, perhaps in three tiers. A structured qualitative approach, based on impact expectations, can inform decision making prior to any quantitative analysis. This is most easily done by returning to the identified risk "touch points" to the business and using some of these as key criteria for types of damage. Examples include income statement, balance sheet, liquidity profile, funding arrangements, operational continuity, personnel safety, regulatory expectations, corporate reputation, and medium-term strategic positioning. Documenting "yes/no" or "high/medium/low" answers against these criteria for each risk supports accountability. This activity can also be undertaken at business-unit level to stimulate monitoring and response planning. A view on probability, cautiously applied, may help to distinguish between high-impact risks, if necessary.

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SOME EMERGING RISK QUESTIONS

CYBER ATTACKS

While cyber risk may be a clear and present threat, its rapid evolution demands that companies be mindful of future threats at the same time as they deal with the current barrage of attacks.

- **What are the main cyber-risk trends?**

  Relating to targets (such as sectors, countries), perpetrator profiles and objectives (such as organized crime, state-affiliated groups), attack vectors (such as ransomware and advanced persistent threats), new business infrastructure vulnerabilities (such as the cloud, internet of things, artificial intelligence, and critical infrastructure)

- **To what extent is the firm (and its suppliers and clients) particularly vulnerable?**

  For example, due to outdated or new (unproven) IT infrastructure; a strong presence in locations with high levels of attack; high-profile business activities or frequent reputational crises that may attract attackers

ECONOMIC PROTECTIONISM

Recent years have seen a plateauing in global trade, an increase in discriminatory trade protection measures, a raft of new restrictive policy proposals, and an undercurrent of covert obstructionist practices.

- **Which aspects of protectionism are of most concern and to which parts of our business?**

  For example, investment and acquisitions, talent deployment and migration, operating license and permits, tariffs and taxation, funds repatriation, intellectual property handover

- **What circumstances and underlying causes would turn an awkward situation into an unsustainable one?**

  Considering the nature of operating condition challenges and profit erosion trends, and the availability of more radical solutions

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BUILDING A PLATFORM FOR ACTION

The effort that firms expend on emerging risk identification is often squandered. Good risk characterization is helpful for appreciating materiality and taking a view on the adequacy of current responses. But scenario analyses, options assessments, and reporting frameworks are required to underpin a strong platform for action.

STRESSING THE FUTURE

The inherent non-linearity of many emerging risks, owing to their complex interconnections and propensity for spawning multiple impacts, renders them unsuitable for ordinary probabilistic analysis. Quantification approaches need to respect the dynamic qualities of critical uncertainties and overcome the limited value of historic data (as actual data points rather than as lessons from history) to assess potential future impacts and extreme (yet plausible) outcomes in a transparent way.

Exhibit 6: Maximizing value from scenarios – three pillars

STRATEGY

- Appreciation of internal stakeholders and agendas served
- Coverage of different types of emerging risks and impacts
- Inclusion of repeatable and bespoke scenarios

SELECTION

- Working group generation of a long list
- Steering group alignment on a short list
- Senior management approval of program

SPECIFICATION

- Business unit and function input to scenario narratives
- Parametization to challenge historic data and risk relationships
- Opportunities for scenario intensification

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Articulating a range of potential risk trajectories and calculating the associated corporate impacts on strategic, financial, and operational targets can galvanize attention and encourage the consideration of response options.

Scenarios are an effective way of making emerging risks tangible. Articulating a range of potential risk trajectories and calculating the associated corporate impacts on strategic, financial, and operational targets can galvanize attention and encourage the consideration of response options. This may also be useful in exposing hidden tensions between commercial ambitions and corporate risk appetite.

Thoughtful approaches to scenario strategy, selection and specification help maximize the value of the endeavor (see Exhibit 6). The fundamental requirements are a clear view on how the output will be used, a strong process for aligning on which scenarios to develop, and detailed design specification for each scenario that properly illuminate possible impacts.

Scenario strategy is the first pillar, containing three different components. The first component relates to the agenda and stakeholders identified earlier in Exhibit 3. Broad-based future-world scenarios, rooted in the projection of global or regional trends, set out alternative business contexts for testing different corporate strategy options. More specific, extreme-event stories are useful for shocking key financials, assessing knock-on consequences, and indicating recovery timelines. Fire-drill scenarios, based on multidimensional crises that emerge and evolve in unpredictable ways, can test C-suite decision making and the support provided by business and functional teams. A final set of scenarios is capable of testing significant failure points in systems and processes that might compromise operational expectations.

The second component considers the merit of exploring a range of emerging risks. As in Exhibit 2, these may be top-down challenges (political, economic, technological) causing market disruption, or they may be bottom-up challenges (terrorist or cyber attacks, operational accidents or personnel misbehavior) that are specific to the firm. Some scenarios may have consequences for the company's future strategic positioning, while others may largely affect financial and operational resilience. Overlaying incident-based and political scenarios on top of macroeconomic ones enables an appreciation of stress impacts. It's not possible, for example, to guarantee that a major oil-rig explosion will take place during a time of high oil prices.

The third component looks at repeatability. Some, more advanced, firms will find it valuable to have a suite of broadly stable scenarios whose impacts can be analyzed and presented on a regular basis. The results can support governance discussions by indicating how external and internal factors are changing the risk profile of the firm. Other scenarios, however, need to be more bespoke, responsive to major current concerns or possible future threats, with a view to underpinning specific planning activities and mitigation measures. Not only might these scenarios need to be executed with some speed to meet decision-making pressures, but, if "repeated" at a later date, they would likely need significant reformulation to reflect new situational dynamics.

The **scenario selection** process is the second pillar. Broadly speaking, a working group must first pull together a long list of scenarios, which is then whittled

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down by a steering committee to a shortlist, based on the value each one will provide. The shortlist can be loosely plotted on a chart or a matrix to demonstrate that different types of risk – from macroeconomic and geopolitical crises to technology disruptions and operational failures – are covered. Following broader stakeholder buy-in, the scenarios and analysis schedule can be approved by a senior management group.

Scenario specification is the third pillar. As part of the sign-off process, senior business, finance, and risk representatives should be able to review the draft scenario narratives and contribute thoughts on drivers, outcomes, and first- and second-order corporate impacts. Equally, a key part of the specification process involves challenging historic evidence of risk relationships and impact levels with plausible future dynamics. Companies do themselves no favors if future-oriented scenarios are constrained by corporate or even market experience; conversely, if the narrative and parameterization is hard to justify, the outcomes will likely be disregarded.

It is advantageous when scenarios can easily be intensified to accommodate a greater appreciation of downside impacts, but modeling challenges sometimes constrain the addition of multiple second-order effects and other permutations. Anticipating and integrating steps that might be taken by key actors (such as politicians, regulators, or competitors) is sometimes hard, but these can be game changing in terms of consequences.

The codification of expectations for scenario design helps to ensure consistent, high quality across developers, who may be in different business units or parts of the world. In the first instance, this entails describing clear links between the sources of risk, model variables, and business data – why might this issue have that effect? It also includes documenting assumptions, data sources, and other inputs. Post hoc, it means reviewing the appropriateness of the methodology and other sanity-checking activities, including the testing of sensitivities.

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ASSESSING RESPONSE OPTIONS

Risk quantification exercises can sharpen hypotheses on the materiality of emerging threats and possible shocks. The effort should initially reveal direct operational impacts (such as production constraints, in the case of a manufacturer) for business units and knock-on internal dependencies (such as sales). A consolidated picture of the financial damage – revenue slumps, asset write-offs, and other costs – will expose liquidity, profit, and financing consequences, and thus any likely fallout for dividend payments, credit rating, and share price. The results may also raise more strategic questions: about the sustainability of current supply chains or value chains, the viability of certain sales markets, and the extent of broader reputational compromise.

This is the starting point for assessing available response options. The existence of multiple, highly uncertain, downside scenarios means it's usually of limited value to develop detailed solutions for each one at the outset, especially as real-world events will always bring surprises. It's often more helpful to analyze the core management levers that might address a range of key threats. Acknowledging that industry and business model variations permit or restrict certain opportunities, a generic basket of levers might include strategic measures such as adjusting the business mix and country exposure profile; financial measures such as extending hedging and insurance arrangements; and operational measures such as tightening security and operational control systems. They should not all be negative in conception: aggressive market plays and investment in research and development can sometimes be more appropriate ways forward.

To inform real planning, a level of precision is required. Generic aspirations – such as building knowhow, accentuating uniqueness, instilling agility, and reinforcing financial buffers – are laudable, but an inability to articulate which measures will deliver those goals, how risks will be reduced by those measures, and the (opportunity) cost of doing so will keep company leaders in the dark as to the efficacy of the proposed endeavors and encounter pushback from the chief financial officer.

Response options can be schematized in a number of ways to compare the business case for each (see Exhibit 7, next page). Four questions can guide thinking:

- **Which financial statement elements will each option assuage and which they will exacerbate?** This directly connects response measures with financial metric concerns. (For some risks, asset or personnel-related criteria may also be necessary.)
- **How costly, effective, and easy to implement are the options?** In other words, at what immediate and ongoing price can the scenario be managed; how much of the potential downside can be addressed; and how feasible is it to execute the measure?
- **To what extent would deployment compromise or conform with the firm's declared strategic ambitions and risk appetite?** How might any tensions be reconciled?
- **Would the intervention take the form of a sunk-cost, up-front investment in risk mitigation or a mid- or post-crisis investment in situation management or fast recovery?** Both options carry reputation risk, if poor judgment appears to have been exercised.

A truly strategic and efficient approach to emerging risks looks at the combination of measures that might collectively address the firm's top-tier emerging risk concerns. Investment decisions regarding solutions should not only be based on a direct cost-benefit basis, but also take into account residual risk exposures (are they acceptable?), any significant knock-on consequences, the lead-in time required to implement the measures, and the speed with which precautionary measures can be unwound should they no longer be needed.

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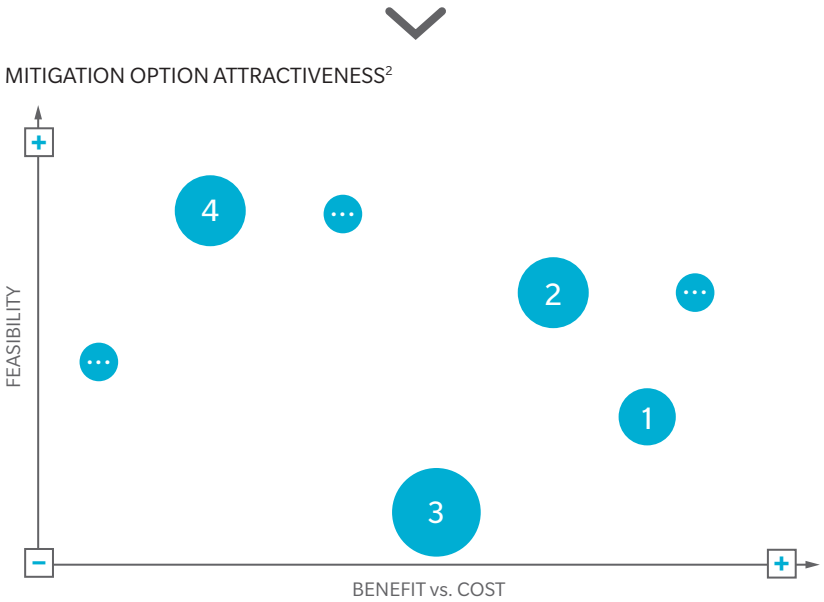
Exhibit 7: Illustrative assessment of response options

PROTECTION PROVIDED AGAINST [SELECTED] RISK

#	INITIATIVE	Enterprise-wide[1]			Business unit			Region		
		P&L	BS	Liq.	A	B	C	1	2	3
1	xxxx									
2	xxxx									
3	xxxx									
4	xxxx									
...	...									



1. Profit and loss, balance sheet, liquidity.
2. Number relates to initiative. Size of bubble equates to scale of mitigation opportunity.

Companies should avoid implementing ad hoc responses that are sensible on an individual, stand-alone basis but whose aggregate effect on performance and positioning is disproportionately negative. Of course, some emerging risks, such as pandemic and cyber threats, require specific measures in addition to more cross-cutting solutions.

Increasingly, companies are codifying this thinking in playbooks. This is especially the case for sudden-onset threats that require fast mobilization to manage crises, but the approach holds for more slow-burn emerging risks too. Progress can be smoother where there is a framework that leverages risk appetite-based materiality triggers, sound principles, good monitoring and detection processes, and well-understood escalation protocols to drive towards decision making and action. Sometimes, mitigation measures can be pre-approved by senior management or the board in the event of certain triggers being hit, supporting the need to react quickly. Over-prescriptiveness brings its own dangers, however, as new complex risks are always different from previous incarnations and materialize in different contexts.

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ACHIEVING INTEGRATION

Analyses of emerging-risk impacts and response options can support crisis preparedness, strategy development, and financial resilience only if the findings are thoroughly embedded in core frameworks and processes such as planning, budgeting, reporting, and performance management, as well as more specific departmental activities.

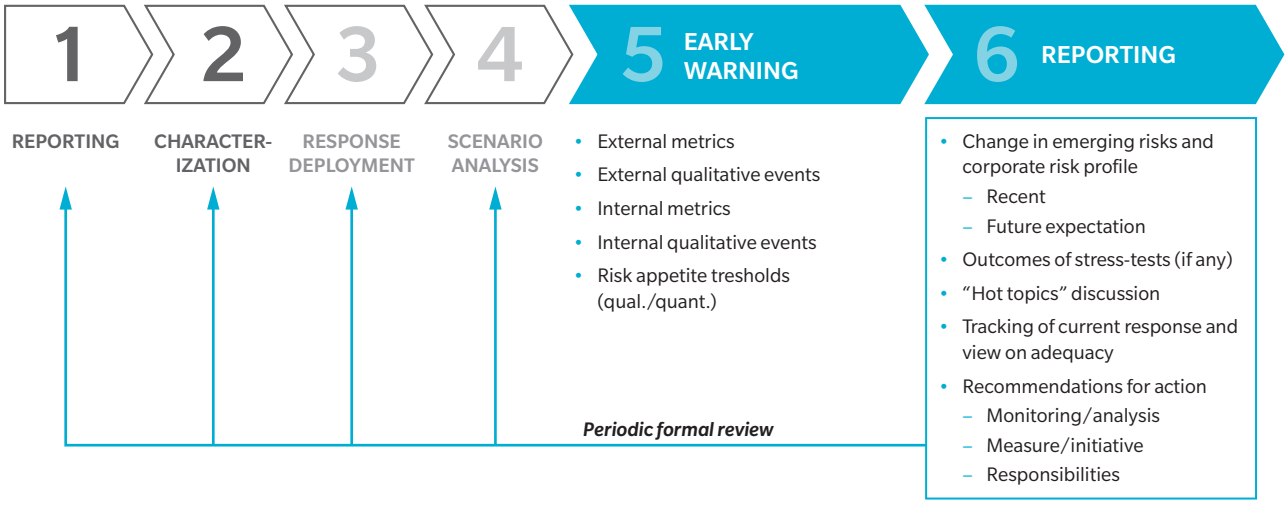
Implementation will depend on institutional preferences as well as analytical capabilities. Take planning support as an example. Will intelligence on emerging risks be used to frame priority setting, to test business unit proposals, or to determine effective risk mitigation? Will the effort be undertaken centrally from the outset or, in the first instance, by the business units, according to a given methodology, and then afterwards aggregated to generate an enterprise-wide view? How are responsibilities divided and coordinated between the Risk, Strategy, and Financial Planning and Analysis functions?

An emerging risks outlook should be a standard feature of risk reports discussed by senior management and the board. This provides company leaders with a different perspective on the evolving business context and helps prepare the ground for decisions that may alter current corporate practices. Initial discussions may prompt calls for a new stress test, a scan of peer group activity, or the exploration of particular response options; in due course, strategic maneuvers, capital reallocation, and other initiatives may be regarded as appropriate. Early insights and a speedy response can sometimes offer an edge in mitigating crises and optimizing investment in a changing world.

Company risk reports that focus on emerging risks benefit from having three core components. An overview section summarizes key developments in the emerging risks landscape that concern the firm and flags any new implications for the current and future corporate risk profile. A deep-dives section reviews the outcome of stress tests or explores a "hot topic" suggested by internal or external intelligence. The final section looks at action, reflecting on the adequacy of current response measures and recommending changes of approach as needed.

For reporting to be credible, it must respect the limitations of the data. A purely quantitative report or dashboard for emerging risks is likely to provoke skepticism and disengagement among those for whom it is intended. Metrics that indicate change are

Exhibit 8: Early warning and reporting



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valuable (and often lend themselves to compelling visual reporting), but truly meaningful ones may not be available. Qualitative information, in the form of developments, incidents, actions, and expert judgment, will often provide a deeper frame of reference for interpreting weak signals. This can help senior management and the board become part of an active sense-making process in the face of uncertainty and ambiguity, encouraging cohesiveness with respect to the way ahead.

A structured but open-minded approach to early warning signals is useful for countering cognitive biases that may privilege certain types of information. Indicators can be derived from the risk drivers and amplifiers identified within the risk characterization process (see Exhibit 8). For some risks, internal data (quantitative or qualitative) are a timelier bellwether of change than synthesized third-party analyses, which may only be accessed following a lengthy collection, analysis, and publication process. Moreover, although interpretations of very early-warning indicators are always open to question, this is often the most opportune moment to begin strategic discussions. Too often, companies are obliged to adopt suboptimal or high-risk responses because prevarication has meant these are the only options left. The drive to timely decision making can often be strengthened when risk indicators are linked to risk appetite thresholds.

Modern data science techniques (see Exhibit 9) will add increasing value to manual risk-tracking mechanisms. They can overlay structured market and economic data with unstructured information from formal reports and social listening activities to better appreciate anomalies and shifts in the risk environment. Often used for detecting customer preference changes and corporate reputation volatility, social listening and big data analyses can also be used for reflecting on possible shifts in issues such as political instability, scientific community concern, client or supplier distress, and personnel misbehavior. Not only do these approaches yield a more broad-based perspective, they also facilitate more dynamic risk assessment, especially in areas such as country risk.

As artificial intelligence becomes more sophisticated, opportunities arising from "unsupervised" and "deep" learning approaches will become more and more available – the former determining relationships between variables and their common drivers, the latter mimicking neural network structures to acquire more complex understanding. Of course, firms will still need to be clear what they are looking for by way of emerging risks and guide analysis towards influential factors; the value of the enhanced computing power is in its ability to harness different data sources to identify correlations that enhance predictive capabilities. Consequently, poor algorithm guidance and oversight can lead to incorrect conclusions. Moreover, although this type of analysis is strong at identifying trajectories and strategies within certain parameterized constraints, it will struggle to anticipate tipping points and upsets, especially where political considerations are at stake.

Exhibit 9: Application of modern data science techniques for risk management

BUSINESS USE	APPLICATION	TECHNIQUE
PREDICTIVE MAINTENANCE	Optimization of parts inventory and service schedules in the airline industry	Predictive analytics based on smart algorithms and historical crime data
CONTINGENCY PLANNING	Monitoring the potential for extreme weather events to disrupt supply routes/logistics	Use of scientific data to model exposure to multiple event variants and planned routing
CYBERSECURITY	Defending ICT networks and devices against novel exploits and insider threats	Use of machine learning to define normal behavior and report on abnormalities in real time
ILLICIT ACTIVITY DETECTION	Improved accuracy and faster response to fraudulent and other bad behavior	Leverage of big data and advanced analytics for the fast recognition of suspicious patterns
BEHAVIORAL TRACKING	Detection of customer preferences to predict future changes in demand	Monitoring of human behavior using IoT technologies and predictive analytics
COUNTRY RISK MANAGEMENT	Prediction of rising threats to provide early warning to operations and dependencies	Sentiment-based model to dynamically map and track hotspots and threat-level changes

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A NEW BOLDNESS

Carrying out traditional risk management well is no longer enough. New risks have swung into view, senior-level demands are changing, and new capabilities are forming. It's an exciting time for risk leaders to reframe the function for the new era.

Risk teams are under increasing pressure to move beyond blocking and tackling, to providing strategic risk advice that can help their companies achieve sustainable resilience in the face of critical emerging risks. Where the expectation isn't already there, it ought to be and probably will be in due course. This shift is vital for firms and a boost for the standing of the Risk function when resource levels are otherwise threatened by cost pressures, opportunities for activity automation, and greater confidence in global economic conditions.

However, strengthening corporate appreciation of complex uncertainties and emerging risks along the lines indicated in this report is no small challenge. To accomplish this, most Risk leaders will need to bring about some adjustments to their function's purpose and interactions. This transition may be underpinned by seven imperatives:

- **Demonstrating stronger business or commercial acumen** and engaging more intensely with the company's strategic ambitions and major investments
- **Setting and presenting the risk agenda more effectively**, finding compelling ways to expose and overcome material biases and blind spots
- **Developing more dynamic relationships with senior management** and business heads, and deeper partnerships across the finance, planning, and treasury teams
- **Nurturing adaptable analytic and advisory skills** within the function that can be deployed in multiple contexts outside routine production requirements
- **Building an accessible repository of intelligence on emerging risks** that can be fed and accessed by Risk, Strategy, and the business units, and instituting more efficient data sharing across Finance and Risk
- **Coming up with new ways of analyzing the possible impacts** of complex, emerging risks, including the exploitation of new data (science) opportunities
- **Leveraging automation opportunities to free up risk resources** for engagement with complex uncertainties

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For many Risk leaders, this agenda will prompt a rethink of the team's capabilities and culture. Operationally, it calls for greater experimentation in analytics, creativity in stakeholder engagement, and agility in developing insights on the materiality of pressing concerns. Strategically, it means championing threats for which evidence is limited or conflicting, and helping to scope innovative risk mitigation solutions. Some risk leaders may need to expand their comfort zone, but those who can mesh strategic vision, influencing skills, and technological fluency on top of their core risk-management expertise will be best positioned to help their firms negotiate dynamic risk environments laden with potential shocks and disruption.

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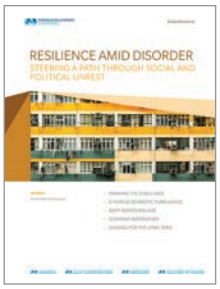

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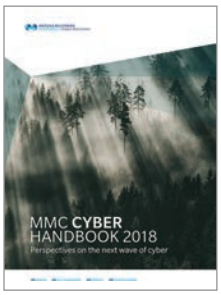

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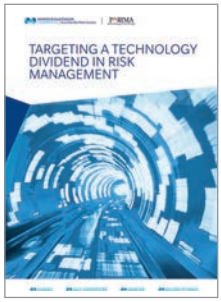

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