

Extending Enterprise Risk  
Management (ERM) to address  
emerging risks

~~Managing  
known  
risks~~

Exploring  
emerging  
risks

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## Foreword by Samuel A. DiPiazza Jr

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In the past several years, many large-scale events that were once thought unlikely, distant, or isolated – climate change, food insecurity, energy supply volatility, overhaul of technology, and a global liquidity crisis, to name a few – have manifested and changed the course of business for many organisations.

Venerable financial services companies have succumbed to the biggest financial crisis in decades; the evolution of the automotive industry has been accelerated by the need to reduce reliance on finite natural resources; food and product safety issues have had major business and reputational impacts; and ongoing concerns such as volatile energy prices and geopolitical instability have made an interconnected global economy both unpredictable and uncertain.

Such global or “emerging” risks are systemic in nature and span beyond the capacity of a single enterprise to contain. While their likelihood may have once been deemed low, their impact is so significant – potentially franchise destroying or opportunity generating – that it cannot be ignored. Not surprisingly, understanding unknowns has become a boardroom issue.

The aftermath of these events has brought to the surface in many instances a lack of preparedness or effective response. Processes may have been in place to identify, assess, and manage risk, but shortcomings became evident where these processes did not systematically refresh based on changing conditions. Identifying the risk after it has already manifested can be too late.

The agility to detect and adapt to changes in the environment and appreciate the interrelations between events when they occur emerges as the key not only to endurance but also new opportunities. Findings of PricewaterhouseCoopers’ 2008 *Annual Global CEO Survey* indicate that 95% of respondents believe change agility is an important or critical source of competitive advantage in sustaining growth over the long term. Indeed, hailed as success stories in the global financial crisis are those organisations that were able to identify signals of increased exposure early on, such as increased mortgage lending, ease of lending requirements, reports of borrowers not understanding the mortgage arrangements they entered into, emergence of new financial instruments that were mortgage related, or a possible balloon in home prices. While some financial institutions

folded as a result of their bets and the difficulty they faced in adjusting these as the signals became more evident, others were able to adjust their positions, make acquisitions, and grow.

Understanding such potentially game-changing events requires heightened awareness of changing conditions and an assessment of the risk’s impact, its interconnectedness with other risks, and implications for the organisation’s strategy and objectives. The risk-resilient organisation continuously scans the environment for changes that could impact its strategy and objectives, convenes as necessary to adjust its course, and recognises that certain risks may be too large for it to manage alone. Collaborative risk mitigation can occur with supply chain partners or with peers (at an industry, geographic, or other level) that may be confronted with the same challenge. Such collaboration is equally valuable among the independent business units of a single organisation.

Organisations need to take a new look at their risk management processes and allocation of resources to ensure that emerging risks are effectively identified, assessed, and managed from strategic planning to day-to-day processes at all levels of the organisation. Risk management practices and resulting risk radars must evolve from an enterprise-level programme, designed to manage the impact of risks on a single organisation, to a collaborative process, one in which many organisations and stakeholders work together to assess and mitigate their shared risks. Successfully engaging in such partnerships provides the rewards of improved preparedness and response to risks that could challenge organisations’ business strategy and survival, and unveil opportunities hitherto unknown.



Samuel A. DiPiazza Jr  
Chief Executive Officer

~~Avoiding  
unknown  
risks~~

Capitalising  
on emerging  
opportunities

## Section 1

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# The heart of the matter

Many organisations have deployed risk management programmes to identify, assess, and manage risks, using techniques such as risk assessment, scenario analysis, and stress testing as a basis for determining response strategies that align with the entity's objectives and risk appetite and tolerance.

However, major events occur that reveal shortcomings in risk management programmes and limits to organisations' resilience in the face of risk. Questions arise: Where was the breakdown? Why did the risk management process not work? How could we have known?

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**ERM is only as effective as it is able to produce a risk radar that is meaningful and forward-looking.**

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Enterprise Risk Management (ERM) is indeed only effective insofar as the risk management process produces a risk radar for the organisation that is meaningful and forward-looking. Think of how, over the past two years, climate change went from decades of scientific debate to a fundamental driver of business strategies. Or think of how, after 9/11, terrorism went from a speculative thought exercise to the top of the boardroom agenda. Such "emerging risks," which are beyond any particular party's capacity to control individually, have transformed the world in which we operate. Some organisations have disappeared as a result, while others have come out stronger. What has made some succeed and others fail?

As the confluence of trends in recent decades has led to greater interdependence in the global economy, it has also increased the interconnectedness between risks, which today often transcend enterprises, industries, and national borders. In pursuit of opportunities, businesses are

increasingly collaborating with a wide range of communities, investors, regulators, and other stakeholders – but in the process, they also expose themselves to an increasing range of risks, not least of which is risk to reputation. While technology has enabled new forms of intra- and inter-enterprise collaboration, its risks are also borderless – as, for instance, would be the impact of a blackout of the Internet. The interactions that comprise the connected world have increased the complexities in managing risk.

The heightened focus on risk management is also expressed by credit rating agencies such as Standard & Poor's, whose guidance for ERM states that "a solid risk-management program must consider risks that do not currently exist or are not currently recognized, but that might emerge following changes in the environment. For these risks, normal risk identification and monitoring will not work because the frequency and impact is usually completely unknown. Nevertheless, experience shows that when they materialize, they have a significant impact and therefore cannot be excluded."<sup>1</sup>

Moreover, the provisions of the United States' "Implementing Recommendations of the 9/11 Commission Act of 2007" – a voluntary but formal set of certification processes, standards, and protocols for business continuity and resilience management – reinforce the expectation that, across the board, stakeholders, investors, and regulators expect organisations to manage risks holistically and mitigate those risks that were once perceived as extreme scenarios, and perhaps still are.

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<sup>1</sup> Standard & Poor's, "Criteria: Summary of Standard & Poor's Enterprise Risk Management Evaluation Process for Insurers," *RatingsDirect* (2007)

To address risks that may seem unknown or unknowable, organisations must adopt a systematic approach to emerging risk identification, assessment, and management. Effectively applying ERM principles can help business leaders think through informed, rational, and value-creating decisions where risks may be emerging. Organisations can better protect themselves and even further their strategies and objectives by embedding this discipline into their risk management culture. Key steps include:

### Identify emerging risks relevant to the organisation

Relative to the strategy and objectives of the organisation, risks should be identified by thoroughly scanning and analysing all relevant risk factors, as remote as they may seem. These risks, together with the other known risks, form the basis for the organisation's risk radar and must be refreshed in real time as changes in the environment occur.

### Assess the risk's significance, interconnectedness with other risks, and implications to the business

Effectively assessing emerging risks requires consideration of the significance of the risk to the entity and its stakeholders (both internal and external), considering impact, probability, and correlations (interconnectedness with other risks) in relation to the organisation's strategy and objectives.

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**By applying ERM to emerging risks, organisations demonstrate the agility to detect and respond to large-scale risks.**

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### Determine risk response strategies, considering collaboration with external parties

To address emerging risks, the organisation may need to accept the risk as it is or respond to it through preparedness and mitigation strategies. In determining its approach, based on the expected impact and likelihood of occurrence in relation to its appetite for risk and its tolerance for deviation from its objectives, the organisation may seek to explore partners with whom to collaborate to mitigate the risk or prepare for its possible realisation. Collaboration is best accomplished with partners (such as value chain partners and peers within the industry or geography) that share both the cost of failure to mitigate the risk and the benefit of effective risk mitigation.

### Routinely monitor emerging risks through effective use of indicators

Resources should be allocated (or reallocated) to identify and monitor indicators of emerging risks and develop the organisational agility to address these should they arise. Considering the nature, scale, and interconnectedness of such risks and also inter-organisational risk mitigation alternatives, such resources must enable dynamic risk management in support of the achievement of organisational strategy and objectives. Emerging risks can be monitored through both qualitative and quantitative indicators. Understanding the circumstances around possible emerging risk events provides a starting point from which to monitor the symptoms of developing issues, which should be refined as further data becomes available to monitor and determine the need for alternative risk responses.

Applying ERM principles to emerging risks represents an opportunity to fully capture the rewards of effective risk management as manifested in the agility to detect and respond to large-scale risks. Such discipline should be embedded in the processes and tools used for planning, executing, and evaluating business performance. With the use of innovative approaches such as scenario analysis and event simulations, supported by a strong risk management culture, organisations will be better able to identify and prioritise emerging risks in order to protect value and further the organisation's strategy and objectives.



~~Register  
of known  
risks~~

Radars of  
emerging  
risks

## Section 2

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# An in-depth discussion

### 2.1 Understanding emerging risks

Emerging risks, also sometimes called global risks, are large-scale events or circumstances that arise from global trends; are beyond any particular party's capacity to control; and may have impacts not only on the organisation but also on multiple parties across geographic borders, industries, and/or sectors, in ways difficult to imagine today. Emerging risks are those large-impact, hard-to-predict, and rare events beyond the realm of normal expectations – what philosopher-epistemologist Nassim Nicholas Taleb calls “black swans” in reference to the fact that Europeans once *knew* that all swans were white – until explorers in Australia discovered black ones.

As these risks present high impact but low probability and fall beyond the organisation's direct control to mitigate, they are often found to be under-resourced. When competing for budgets, those risks with greater probability of occurrence tend to win. When competing for management attention, those risks deemed more likely to impact performance targets and rewards win again. However, failure to understand and track these risks can lead to a situation in which today's afterthought becomes tomorrow's global headline issue. As a result, these risks are often referred to as the unexpected or the unknown. One can argue, however, that “almost all consequential events in history come from the unexpected.”<sup>2</sup> In fact, with adequate information and analysis, the unexpected can often be predicted by extrapolating from variations in statistics based on past observations.

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**Emerging risks are those large-scale events or circumstances beyond one's direct capacity to control, that impact in ways difficult to imagine today.**

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The speed and impact of these risks are further exacerbated by their interdependence with other risks, which requires a profound understanding not only of the underlying risk factors but also of other events that may be triggered. In a global economy, where opportunities are sought across borders and industries, risks spread equally vastly.

The sub-prime mortgage crisis occurred when, over a very short span of time,, firms found their holdings of mortgage-backed securities and collateralised debt obligations (backed by sub-prime mortgages) turn into positions that could not be sold in an orderly manner. The crisis affected seemingly unrelated firms, with the credit markets freezing up and liquidity crises ensuing around the world, forcing global central banks to inject billions of dollars into capital markets and slowing economic growth in virtually every country around the globe.

Some companies did a better job than others at proactively monitoring their portfolios through this crisis, identifying trends, performing portfolio analysis, and examining their market risk exposures. They were able to recognise when the organisation's risk tolerances were exceeded and alter their course of action. For example, some companies chose to reduce their stockpiles of mortgage and mortgage-related securities and buy expensive insurance to protect against further losses. Such proactive monitoring of risk that embeds analysis of trends and understanding of interdependencies in the interconnected business markets can help avoid losses and seize opportunities.

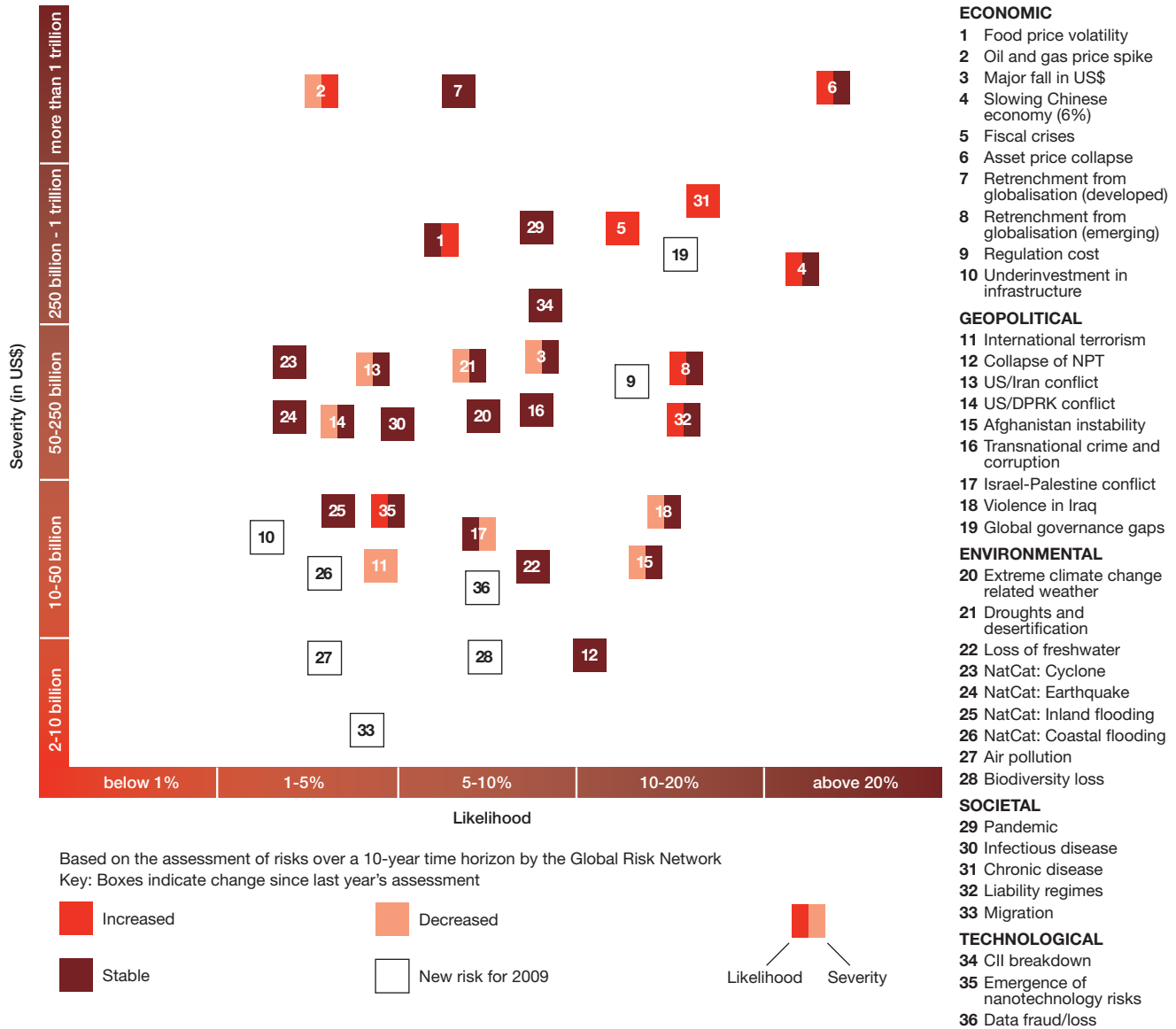
Through its Global Risk Network, the World Economic Forum has identified a number of global risks and plotted them in terms of likelihood and severity. (See Figure 2.1.1.)

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<sup>2</sup> Nassim Nicholas Taleb, *The Black Swan: The Impact of the Highly Improbable*, Random House (2007)

2.1.1

Global risks landscape 2009: Likelihood with severity by economic loss



Source: World Economic Forum, *Global Risks 2009: A Global Risk Network Report*

Further examples of emerging risks can be derived from various studies. A starting point for organisations to consider may include the illustrative, non-exhaustive list in Figure 2.1.2.

## 2.1.2

## Illustrative examples of emerging risks

- **Increasing natural resource constraints**  
(e.g., loss of freshwater reserves, depletion of oil reserves, loss of biodiversity) that could raise the cost of raw materials and increase food prices, human suffering, and the pressure to identify alternate energy sources.
- **Natural or man-made disasters**  
(e.g., floods, terrorism, cyber-terrorism, viruses, spyware) that could cause business disruption and human catastrophes.
- **Increased industrial pollution and rising global carbon emissions**  
leading to climate change that could cause a decrease in biodiversity, a shift in locations of production and consumption, and regional resource shortages.
- **Rapidly shifting demographic patterns**  
(e.g., ageing population) that could cause talent shortages in certain labour markets or within certain capabilities, lack of adequate skills, or shifts in customer demands and/or loyalties.
- **Rising labour costs driven, in part, by expanding benefits**  
(pension, workers' compensation, and other non-salary expenses), which could result in lower profitability and loss of competitive advantage.
- **Increased volatility in asset prices and commodity markets**  
(e.g., oil price shock, asset price collapse) that could cause fluctuations in cost structures that cannot readily be passed on to the consumer or otherwise absorbed.
- **A global liquidity crunch**  
(e.g., resulting from sub-prime mortgage lending practices) that could raise the cost of capital for financing transactions.
- **Emergence of new technologies**  
(e.g., nanotechnology) that could evolve in unforeseen ways in an emerging market – for example, leapfrogging existing technologies as new applications arise.
- **Technology and communication disruptions**  
(e.g., Internet blackout) or system failures, which could lead to business disruptions and economic loss.
- **Changes in laws and regulations**  
(e.g., spread of liability regimes impacting foreign investment, or industry-specific laws such as prohibition impacting the alcohol beverage industry) that could cause an overhaul in the manner by which businesses are run, or affect the sources of their profits.
- **A realignment of power in the capital markets of a country**  
(e.g., increased governmental control of companies, foreign investment) that could lead to classes of activist investors who could pressure for different industry approaches to capital structure, profit allocation, or strategic goals.
- **Decline in global economic growth**  
(e.g., caused by slowed Chinese economic growth, global recession, unsustainable deficit levels) that could negatively impact demand and put downward pressure on prices.
- **Political crises**  
(e.g., failed and failing states, war, Middle East instability, failure of democratic institutions, regime change), which could result in nationalisation of assets, increased regulation, protectionist tendencies, or other loss of control.
- **Pandemics and other health crises**  
(e.g., fast-traveling pathogens such as avian flu, developing world disease such as HIV/AIDS, tuberculosis, malaria), which could jeopardise supply chain, consumers, employees, and others.
- **Economic inequality**  
which could exacerbate poverty and suffering and increase pressure on business to engage in humanitarian efforts.
- **Rise in nuclear capabilities**  
which could endanger global political stability and physical security.
- **Terrorist threats**  
which could reduce economic confidence or cause direct economic losses as well as loss of life, property, and security.
- **Increased competition from emerging markets and/or within the home market**  
which could cause downward pressure on prices.
- **Rise in anti-globalisation sentiment and protectionism**  
(e.g., fiscal policies, trade embargoes, heightened tariffs, or other anti-competitive practices), which could cause retrenchment from global trade and investment.
- **Increase in corruption**  
(e.g., bribery in procurement or sales), which could create anti-competitive business practices and lead to regulatory fines and sanctions and reputational damage for perpetrators.
- **Decline in recognition or enforcement of intellectual property rights**  
(e.g., patents, licenses), which could cause unlicensed commercial activity or loss of proprietary information.

Source: PricewaterhouseCoopers

Organising relevant emerging risks can follow different categorisation schemes. These should be integrated with an organisation's ERM framework to facilitate ownership and accountability as well as due processes for identifying, assessing, and managing these risks. Examples of such categorisation include:

By source of the risk or theme	e.g., per categories of the World Economic Forum Global Risk Network: <sup>3</sup> <ul style="list-style-type: none"> <li>• Technological</li> <li>• Geopolitical</li> <li>• Societal</li> <li>• Environmental</li> <li>• Economic</li> </ul>
In relation to objective types	e.g., per the Committee of Sponsoring Organizations (COSO): <sup>4</sup> <ul style="list-style-type: none"> <li>• Strategic</li> <li>• Operational</li> <li>• Reporting</li> <li>• Compliance</li> </ul>
By characteristic of the risk	e.g.: <ul style="list-style-type: none"> <li>• Exogenous/endogenous</li> <li>• Predictability</li> <li>• Degree of control</li> <li>• Duration</li> </ul>
By the manner in which the risk manifests	e.g.: <ul style="list-style-type: none"> <li>• Long-term changes</li> <li>• Sudden, unexpected events</li> <li>• Gradually deteriorating operating conditions</li> <li>• Local events with systemic impacts</li> <li>• Resulting from catastrophic events</li> </ul>

The PricewaterhouseCoopers 2008 *Annual Global CEO Survey* reveals several findings in relation to risks spanning beyond the enterprise itself:

- The risks deemed most likely to occur include political and religious tension; the emergence of a new set of countries that will challenge the economic, political, and cultural power of the G8; and pressures on natural resources.
- Top threats to business growth are deemed to be the downturn in major economies, disruption of capital markets, over-regulation, energy costs, inflation, low-cost competition, and availability of key skills.
- Top opportunities for business growth are deemed to be better penetration of existing markets, new product development, new geographic markets, mergers and acquisitions, and new joint ventures and/or strategic alliances.

It is important to recognise that emerging risks can be opportunities rather than threats if they're identified, assessed, and managed for competitive advantage, as illustrated by the successes emerging from times of turbulence and change.

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**Emerging risks can be opportunities rather than threats if they're identified, assessed, and managed for competitive advantage.**

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<sup>3</sup> World Economic Forum, *Global Risks 2009: A Global Risk Network Report* (2009)

<sup>4</sup> Committee of Sponsoring Organizations (COSO), *Enterprise Risk Management – Integrated Framework* (2004)

## 2.2 Allocation of resources to preparedness

Successes and failures in responding to emerging risks are often the result of organisations' rigor in applying risk management principles and their agility in adjusting to a changing environment and new challenges. To be able to effectively uncover such risks, resources need to be sensitised and focused on identifying the broad realm of potential risks, including emerging risks.

In most organisations, there is a fundamental mismatch between risk exposures and risk management resource allocation. According to some estimates, the risks that led to 60% of "rapid losses" (drops in shareholder value by one-half within one year) experienced by Fortune 500 and FTSE 100 companies are strategic in nature.<sup>5</sup> Yet, the majority of risk management resources tend to be focused on operational, financial, and compliance risks. Strategic risks and "black swan" types of low-probability risks are often under-resourced.

The resource allocation conundrum can be understood by considering the continuum of risk, from known (K) through unknown (u) to unknowable (U). Some risks, particularly natural disasters, can be said to be "known." Their causes, probability of occurrence, and likely impacts are understood and well defined, although there is still some uncertainty surrounding these estimates. Known risks have occurred previously – and, therefore, can be measured and managed.

Other risks are "unknown." The risk events are well defined, but it is not possible to assign probabilities as to the occurrence of specific events (for example, terrorism and systemic financial instability). Another way of looking at unknown risks is to think of them as risks where there are several competing plausible models of how reality might unfold, but no accepted paradigm. Unknown risks require governments or businesses to build resilience into their risk models – through continuity planning, stockpiling, slack in the system, or diversification of sources of vital goods.

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**Risk management resources tend to be focused on operational, financial, and compliance risks. Strategic risks and "black swan" types of low-probability risks are often under-resourced.**

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The last class of risks is those that are "unknowable." Unknowable risks have not yet emerged, and our understanding of the systemic linkages of unknowable risks is speculative. "Unknowability" is a key consideration in the context of risk conflation, where a large number of possible combinations of risks and vulnerabilities can lead to a vast array of possible outcomes, some of which are "perfect storms."

Resources are typically allocated more heavily to known risks, for several reasons:

- First, existing incentives tend not to be aligned with long-term corporate performance. In the case of sub-prime mortgages, for example, many players, such as mortgage brokers and investment banks that assembled collateralised debt obligations (CDOs), were compensated for deal flow with too little consideration for the longer-term risks they introduced into the financial system. They had little incentive to tighten standards because the risks were, in theory, borne by other parties. In practice, of course, these players were selling long-term shareholder value and financial system stability for year-end bonuses.
- A second reason is a general lack of perceived relevance – a failure to recognise the significance of global phenomena until events result in local impact. Hindsight, as the saying goes, is clear – a cliché that seems to be repeated any time an emerging risk manifests. Yet, the potential impact of those risks can most certainly be cushioned through more proactive, prudent, and collaborative approaches. In other words, relevance need not be an afterthought.
- The third constraint to expanding ERM to emerging risks is both the most pertinent and the oldest: limited resources. Resources need to be allocated (or reallocated) to help anticipate risks that are currently being ignored.

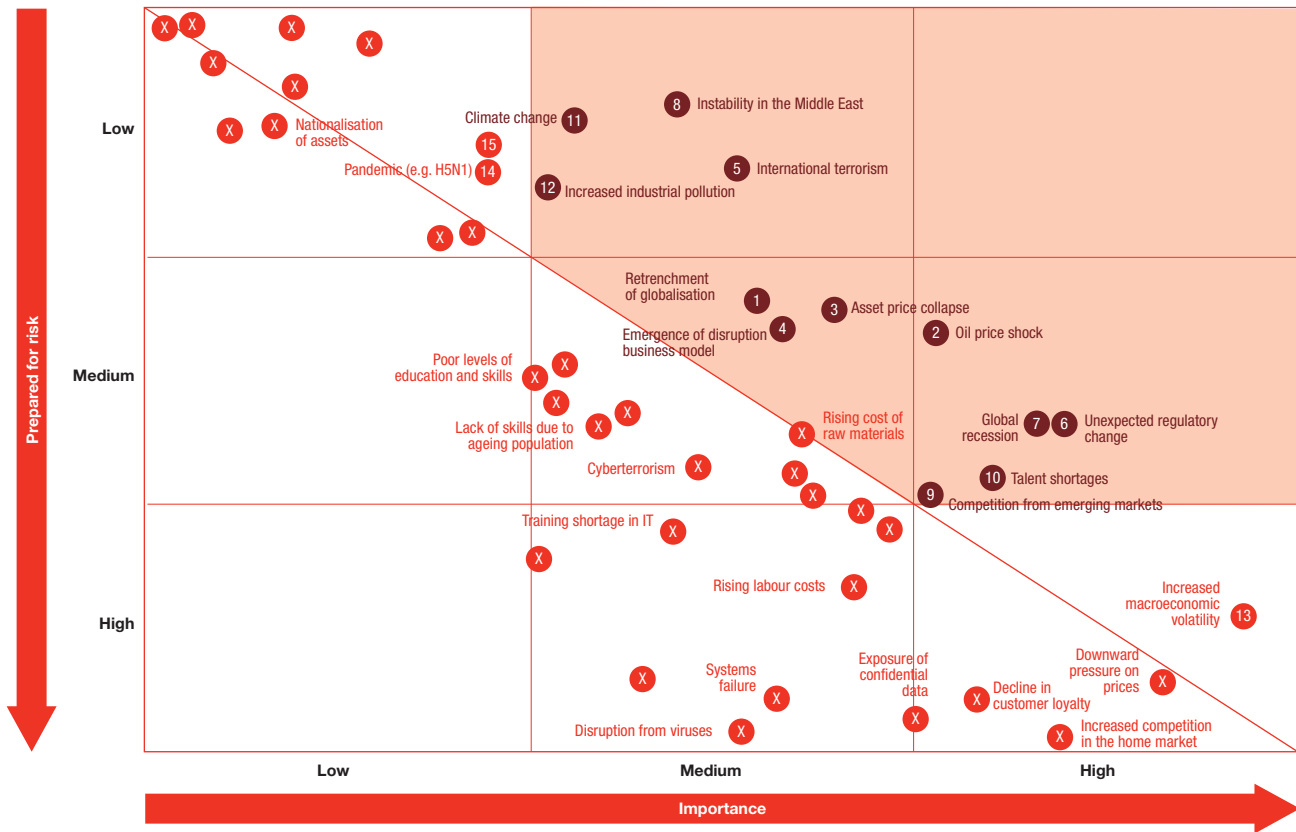
<sup>5</sup> PricewaterhouseCoopers, *State of the Internal Audit Profession Study: Targeting Key Threats and Changing Expectations to Deliver Greater Value* (2008)

Figure 2.2.1 illustrates current levels of preparedness to respond to emerging risks, as identified by leading executives.

Applying ERM to address emerging risks will help improve preparedness against the most uncertain events, through a reallocation of existing resources. Of course, different types

of emerging risks require different levels of resource allocation, along with different approaches. A risk-resilient organisation seeks to minimise unknown risks by actively identifying and assessing such risks, devising strategies for mitigation, and monitoring changes in exposures routinely. As a result, unknown risks transform into known risks and an organisation is left with a more manageable set of constraints.

**2.2.1**  
Long-range risk grid



Source: Economist Intelligence Unit, *Risk 2018: Planning for an Unpredictable Decade* (March 2008)

## 2.3 Embedding the discipline of addressing emerging risks into ERM

The discipline for addressing emerging risks should become part of the organisation's strategic planning, business execution, and performance evaluation and reward structure. How does this differ from traditional risk management activities? Applying ERM principles to emerging risks is an opportunity to share the effort and rewards of preparedness and mitigation with partners. Companies with the vision to connect global trends and risks with their own strengths and market knowledge, and to participate in collaborative efforts to manage those risks accordingly, will be better prepared for global growth.<sup>6</sup> Therefore, building on an established framework for thinking about ERM (such as COSO's Enterprise Risk Management – Integrated Framework), several activities should be expanded to effectively address emerging risks and embed these practices into the organisation's business planning, execution, and evaluation processes.

As an organisation designs or evaluates its internal environment, it should ensure it has the requisite capabilities and skills within the organisation to ensure adequate oversight and management of emerging risks to support the organisation's strategy, mission, and values. (See Figure 2.3.1.)

To ensure that each of these components is effectively in place throughout the various parts of an organisation, and to engage the relevant external parties as necessary, organisations should assess their risk management culture periodically.

As a result of an effective risk management culture and extending ERM to emerging risks, the organisation follows a structured approach to define, assess, and manage all relevant risks, including those that may be just emerging. This discipline becomes part of managing the business.

2.3.1	
ERM applied to emerging risks	
ERM components per COSO	Applied to emerging risks
Objective setting	The objectives that the organisation sets for itself at various levels – enterprise-wide, business-unit-specific, or otherwise – and the amount of risk it is willing to accept in pursuit of these objectives should serve as the basis for identifying, assessing, and managing relevant emerging risks. These risks may impact one or several of the organisation's objectives, which may range from strategic to operational, compliance, and reporting.
Event identification	Event identification involves not only capturing known emerging risks but also performing historic and forward-looking analysis to uncover potential exposures relative to the organisation's objectives. Embedding this capability into day-to-day processes requires awareness, training, and dedicated focus on such risks across the organisation, to the extent that unknown risks are reduced and the organisation can focus its efforts on managing currently known risks and preparing for those that are unknowable.
Risk assessment	This step requires consideration of the impact of emerging risks not only on the organisation or business unit itself but also on other organisations or business units. It also requires an understanding of the ways in which interconnections between emerging risks and other risks could increase the emerging risk's impact or likelihood of occurrence. The organisation should have a clear definition of how much variance from the achievement of objectives it is willing to tolerate.
Risk response	An organisation should determine the appropriate risk response based on its defined corporate risk appetite and tolerance levels and the results of its assessment of the emerging risk. While the typical risk response options of accepting, avoiding, sharing, or reducing remain, the most effective response may be one that is achieved through collaboration with partners, a response that can help mitigate the impact or likelihood of occurrence, minimise negative impact on the achievement of objectives, and possibly even capture opportunities.
Control activities	Checks and balances deemed appropriate to control the risk should be in place to manage known risks and prepare for the occurrence of unknowable risks.
Information and communication	Information and communication are essential to engaging the requisite parties, raising awareness, and provoking analysis of emerging risks in relation to the organisation's objectives, particularly in light of the interconnectedness of emerging risks with other risks.
Monitoring	Monitoring the effectiveness of emerging risk mitigation efforts requires evaluation of past events and analysis of future trends. A look-back analysis considers how emerging risks were or could have been mitigated, thus providing lessons on how to further enhance the ability to manage such risks in the future. Forward-looking analysis requires the definition and use of relevant leading indicators to alert management to changes in the organisation's exposure to emerging risks.

Source: PricewaterhouseCoopers

<sup>6</sup> World Economic Forum, *Global Growth@Risk 2008: A Report of the Global Risk Network* (2008)

~~Established~~  
~~risk~~  
~~tools~~

Optimised  
approaches  
to risk

## Section 3

# What this means for your business

While many organisations have processes and structures in place for managing risks day-to-day, practices reveal that these often fail to fully address emerging risks, largely due to many of the inherent characteristics of these risks described above: hard to quantify, seemingly remote, with low probability but high impact.

The seemingly more immediate obligation to focus on the short or medium term often impedes the attention of many organisations to such risks. An organisation's stakeholders, however, focus not only on short-term results but also on long-term success.

The culture of the organisation must reinforce the fact that ERM can be optimised by expanding the traditional application of its principles to emerging risks and further risk resilience. ERM, as defined by leading standards such as COSO, provides key principles that can be leveraged for managing emerging risks. Consider four essential steps:

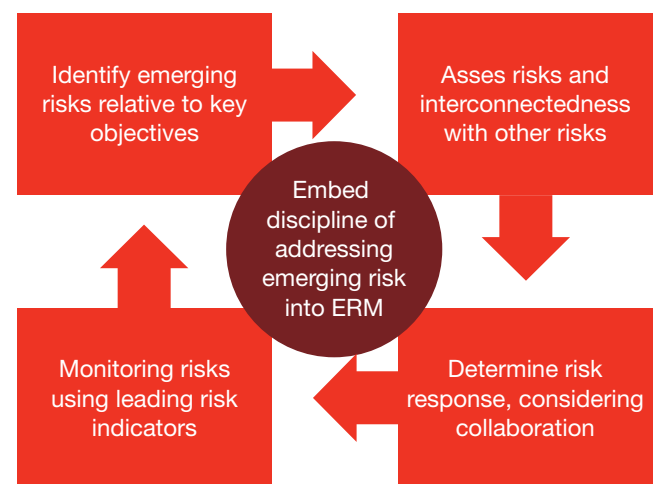
1. Identify emerging risks that are relevant to the organisation
2. Assess their significance, interconnectedness with other risks, and implications
3. Determine how to respond to such risks, considering options to collaborate with partners
4. Monitor routinely emerging risks through effective use of leading indicators

Each of these steps benefits from the broadest possible perspectives and contributions, not only internal but also external, managed through an integrated risk management process.

(See Appendix A for a graphical depiction of these steps and Appendix B for case study illustrations.)

### 3.0.1

Embedding the discipline of addressing emerging risks into ERM



Source: PricewaterhouseCoopers

### 3.1 Identify emerging risks relative to key objectives

Organisations are increasingly required to think of their risk profile not just as their own, but also as an integral component of their international partners' risk profiles. Success in a connected world is only possible through a paradigmatic shift from *ignoring* risks that do not readily appear related to one's enterprise, to *embracing* and managing emerging risks throughout an organisation's value chain. For example, a local manufacturer may today serve as customer to a supplier on one continent, vendor to a retailer on a second continent, client to a merchant bank from a third continent, and financial intermediary to a fraternity of investors from every continent. Each of these relationships implies new opportunities but also new risks. A failure of *any single relationship* entails consequences for *all* relationship partners. Thus, an understanding of the risks faced by each partner has become an important input in identifying and evaluating risk.

Based on the organisation's strategy and goals, management should identify all potentially relevant risks, both organisation-wide and at the various levels and units of the organisation. To go beyond known risks, organisations should explore what may seem unknown but could be uncovered through analysis of historical data and forward-looking analysis. Management should regularly perform a thorough scan of characteristics and changes in the environment to identify events that may have impacted the organisation's shareholder value in the past or may impact it in the future. Drivers to consider include economic, social, political, technological, and natural environmental events, all of which can be identified through external sources such as media articles, analyst and rating agency reports, and publications by not-for-profit foundations.

To identify all relevant risks, organisations should capture perspectives from industry, academic thought leaders, economists, non-conformists, and contrarians in general –

anyone who can help take the thinking of internal executives and experts to new places. History shows that many risk events have resulted as much from complacency, limited foresight, and a reluctance to challenge the status quo as from failures of controls, judgment, and governance.

Risks can be classified in different ways – for example, by source, related objective, implication, or other characteristics that help to analyse the risk and assign accountability for monitoring and response. This should be aligned with the organisation's existing risk classification framework (for example, as part of its ERM programme), considering a broad range of drivers such as economic, social, political, technological, and natural environmental.

The organisation should define tolerance levels for all key risks or risk categories identified. How much variation from the achievement of objectives is acceptable? This should be in sync with the overall level of risk the organisation is willing to take in pursuit of its objectives – in other words, its risk appetite. Certain emerging risks could put the organisation out of business, while others may present an opportunity to reshape the market.

Emerging risks may present a threat or an opportunity for the enterprise as a whole or for a certain business unit or geography. By definition, they may also affect other organisations, positively or negatively. The organisation's thinking, therefore, needs to extend beyond its own boundaries.

A meaningful risk radar is therefore the result of analysis not only of known risks but also of those larger, systemic risks that may have implications not yet known. In today's ever-changing business environment, organisations must continually update their identification techniques and mechanisms in order to refine their analyses of risks, increasing their ability to predict risk events such that they can create better and faster response mechanisms for dealing with major events.

### 3.2 Assess the risk’s significance, interconnectedness with other risks, and implications to the business

Traditionally, risk assessment considers the significance to the entity and its stakeholders (both internal and external) as well as correlation between risks, often based on observed facts and trends. Assessing emerging risks requires a broader evaluation of such risks, considering the larger scale of impact and the interconnectedness of risks that typically have not yet manifested. As for any risk assessment, the assessment of emerging risks requires involvement of the requisite subject matter experts and use of a consistent risk rating methodology.

Scenario analysis can serve as an effective means for organisations to estimate their potential risk exposures and levels of preparedness should catastrophic risk events emerge. According to a 2008 Economist Intelligence Unit report, “by thinking through different futures, executives have the opportunity to stress test their strategy and challenge the assumptions they hold about what might be successful in the years ahead.”<sup>7</sup>

To develop risk scenarios, leading organisations typically take a workshop-based approach, supported by requisite planning and review phases. Such an approach, conducted by an effective facilitator and involving the requisite subject matter experts, comprises the six key steps detailed in Figure 3.2.1.

Leading practices for conducting such scenario analysis workshops indicate that the impact and likelihood of emerging risks should be assessed using risk rating scales to generate heat maps or radars of the risks. This enables relative

comparisons and determination of risk responses based on the organisation’s risk appetite and tolerance levels, which should be defined in strategy setting and business planning.

Risk rating scales may be defined in quantitative and/or qualitative terms. Quantitative rating scales bring a greater degree of precision and measurability to the risk assessment process. However, qualitative terms need to be used when risks do not lend themselves to quantification, when credible data is not available, or when obtaining and analysing data is not cost-effective. Due to the strategic nature of emerging risks, rating scales tend to be qualitative. Risk rating scales are not one-size-fits-all, so should be defined as appropriate to enable a meaningful evaluation and prioritisation of the risks identified and facilitate dialogue to determine how to allocate resources within the organisation. Risk rating scales provide a common form of measurement to help organisations prioritise risks and determine required actions based on their defined risk tolerance.

For emerging risks, a key difference from traditional ERM approaches is that risk rating scales need to consider the cross-organisational impact and potential scale of the risks as well as interdependencies with other risks. Similarly, the time horizon used to assess the likelihood of risks should be consistent with the time horizons related to objectives. Some emerging risks, such as climate change, may challenge this notion with an understanding that long-term consideration may create value in the achievement of an organisation’s objectives.

A risk map enables analysis over time as risk assessments are refreshed (e.g., noting upward or downward trend of threats and the extent of positive or negative correlations between



Source: PricewaterhouseCoopers

<sup>7</sup> Economist Intelligence Unit, *Risk 2018: Planning for an Unpredictable Decade* (2008)

certain risks). In particular, the interconnectedness of emerging risks necessitates some assessment of their degree of correlation. This can be conducted through covariance analysis, where different variables are evaluated in relation to each other. The degree of correlation between various emerging risks (e.g., perfect positive correlation, perfect negative correlation, no correlation) enables the organisation to more effectively and efficiently mitigate risks. For example, similar mitigation strategies may be employed to manage risks that are correlated, whereas risks that have no correlation may require disparate mitigation techniques.

In addition to assessing threats to the organisation, leading organisations also assess how certain events or circumstances might call on their core activities to help other organisations manage exposures to catastrophic risks. The ability to capitalise on such opportunities requires adequate information flow, both internally and externally.

### 3.3 Determine risk response strategies, considering collaboration with external parties

Risk responses vary depending on the assessment of the risk, how much risk the organisation is willing to take on, and the organisation's tolerance for variation from its objectives. As the organisation selects its responses to emerging risks, it should do so on a risk-informed basis. It may choose to accept certain emerging risks by relying on natural offsets within a portfolio or considering the risks as a cost of doing business, in line with defined risk tolerances. For those risks where risk tolerances are exceeded and action needs to be taken, an organisation may find that the risks span beyond its individual control, and risk mitigation must explore collaborative approaches. PricewaterhouseCoopers' 2008 *Annual Global CEO Survey* revealed that collaboration in pursuit of long-term success is most developed with employees and trade unions (83% of survey respondents engage in such collaboration), customers (84%), supply chain partners (75%), providers of capital such as creditors and investors (67%), and government and regulators (61%).

Collaborative risk mitigation strategies are often the only means available for organisations to envision the unknown and adequately protect their assets – especially in cases without historical precedent. In a connected world, both the rewards and risks of doing business are, by definition, connected. Thus, effective responses to networked risks must themselves be networked in nature. However, collaborative efforts need not necessarily include multiple organisations and/or government and non-government agencies.

The same principles and processes are equally relevant when organising responses among an organisation's business units, each of which may have different exposures and resources relative to a particular emerging risk. It is important for corporate headquarters to understand different scenarios of how a risk may manifest differently for each business unit. Independent business units may also recognise the benefits of collaboration with other units. While one business unit may have more direct exposure to a particular emerging risk (for instance, rising energy prices and their effect on transport costs), another business unit may be able to help mitigate that risk and generate business opportunity through its production of alternate energy sources. Mitigating risks optimally for the organisation as a whole may require the units to work together closely. Collaboration can help decision makers rationalise the implications of emerging risks to their respective organisations or business units, and mitigate emerging risks through techniques that supplement existing approaches to risk management.

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**Collaborative risk mitigation strategies are often the only means available for organisations to envision the unknown and adequately protect their assets – especially in cases without historical precedent. In a connected world, both the rewards and risks of doing business are, by definition, connected.**

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Consider the following approach to the development of collaborative risk mitigation strategies:

#### A. Challenge the status quo

Various mitigation strategies may present themselves. Organisations often greet emerging risks with inaction simply because stakeholders are not obliged by regulations and are resource-constrained in their decision making. They often believe the short-term expense of allocating resources to today's manageable risks outweighs the long-term benefits of preparing for tomorrow's catastrophic risks. Misaligned compensation structures, which also focus on the short term, exacerbate the tendency to ignore emerging risks. The cost of inaction should be measured in relation to the expected impact of the risk, should it materialise, highlighting the fact that doing nothing is not cost-free.

#### B. Identify potential collaborators

Recognising that the impact of emerging risks is typically larger than the enterprise itself, and that preparedness and/or mitigation require collaboration, it is important to define the value of collaboration and identify potential partners. A variety of stakeholders may prove appropriate collaborators, whether private or public, competitor or alliance partner, regulators, private sector organisations, and/or non-governmental organisations.

#### C. Explore collaborative risk mitigation scenarios

Such scenarios should help determine how potential collaborators would respond should an emerging risk actualise. The objective is to fully explore the complexities of managing the emerging risk and determine a comprehensive set of interactions that would help minimise collective losses and maximise opportunities resulting from the risk. This exercise helps estimate the magnitude of resources needed to manage the risk and highlights the importance of managing the weakest link. For example, in global supply chains, a single weak link is sufficient "to allow a purposeful agent to penetrate the supply chain and to undermine the risk mitigation actions of all others in the supply chain."<sup>8</sup>

#### D. Assess the challenges and benefits of collaboration

Each collaboration partner must develop a clear view of what can be gained from collaboration and what efforts will be needed to overcome the challenges.

Skepticism around the feasibility or effectiveness of a collaborative approach to emerging risks is often centred on the following factors:

- **Multiple stakeholders**  
The various parties affected by a given risk may have different views on the issue, different levels of urgency, and different preferred strategies; moreover, the time and effort required to coordinate response strategies among all parties may be extensive.
- **Information asymmetries**  
Imperfect information and challenges in measuring the costs and benefits that accrue to individual entities complicate the identification and mitigation of emerging risks.
- **Myopic mindset**  
The narrow view of risks is exacerbated by the complexity of risks that span beyond the control of the enterprise – especially when these are not deemed likely to materialise within a defined period.
- **Analytical ambiguities**  
The absence of historical data with which to substantiate loss estimates makes it challenging to gain consensus on risks and collaboration opportunities.
- **Misalignment of incentives**  
Compensation schemes are rarely constructed with risk management in mind, and existing behaviours rarely include engagement of external parties to mitigate risks.

<sup>8</sup> Howard Kunreuther (Wharton School of the University of Pennsylvania), *Risk Management Strategies for Dealing with Interdependencies* (2007)

The value and benefits of collaboration typically manifest as:

- Cost savings that accrue – for example, from reduced insurance on key assets
- Improved information resulting from improved dialogue and data analysis around the risk issue, producing benefits such as improved mechanisms for identification, mitigation, and monitoring
- Reduced staff hours needed to respond to catastrophic events
- Reduced losses if the risk occurs – for example, collective lobbying for or against a change in regulation may attenuate the severity of the resulting impact on the organisation
- Increased shareholder value from heightened shareholder confidence, resulting from perceived improvement in preparedness and mitigation strategies

While the quantification of the costs and benefits often remains ambiguous, studies show that all parties stand to benefit from collaboration.

### E. Develop a proposed collaboration process and governance over the process

This helps ensure that the process is carried out effectively, results are achieved, and issues are escalated. Illustrative examples are shown in Figure 3.3.1. Key collaborators must agree and “buy in.” To facilitate decision making and gain definitive commitment, a leader should be nominated. This may be done on the basis of overall risk exposure, annual revenues, or global presence, or a democratic voting process may be employed. A rotating leadership structure may also be used to distribute leadership responsibilities among key collaborators, on a time or phase basis.

### F. Evaluate and refine collaboration

To ensure continuous improvement and adjustments to changes in the environment, all stakeholders periodically identify and assess the costs and benefits of collaboration measures. This involves looking at past events and identifying successes and failures in risk mitigation or preparedness. Risk-resilient organisations revisit and revise collaboration measures as necessary with the various stakeholders involved as a means for continuous improvement and to ensure adequacy and relevance of risk response efforts.

## 3.3.1

Illustrative example of collaboration for sample risk categories

Sample emerging risks	Illustrative examples of collaborative risk mitigation, and risk mitigation strategies
Security	<ul style="list-style-type: none"> <li>• Companies within the airline industry recognised in the aftermath of 9/11 that all needed to adopt heightened security measures within their business and buy into the measures necessary at airports to mitigate the risk of further security breaches. An industry-wide collaboration approach was necessary to minimise the risk of terrorist attacks through explosive devices transferred onto aircraft in passenger baggage. Measures such as the establishment of baggage screening systems could only be effective if all airlines participated and shared the cost burden, and collectively realised the benefits of added security. If even a single airline were to opt out, all airlines would be exposed to the catastrophic risk of an explosive device being transferred onto their fleet.<sup>9</sup></li> <li>• Sponsored by the US Department of Defense (DOD) and the UK Ministry of Defence (MOD), the Transatlantic Secure Collaboration Programme (now the Transglobal Secure Collaboration Programme, or TSCP) was created in 2002 to address issues of information security in cross-company and cross-border collaboration in a post-9/11 world, providing a forum for information-sharing among defence industry participants. TSCP establishes standardised policies and procedures to enhance collaboration between government defence departments and defence firms. It also seeks to improve compliance with national standards and reduce operational costs, has created an email programme through which sensitive information can be transmitted securely, and continues to enhance the efficiency and security with which its members communicate and collaborate. In addition to the US DOD and UK MOD, TSCP members now include BAE Systems, Boeing, EADS, Raytheon, Lockheed Martin, the Netherlands Department of Defense, and others.</li> </ul>
Climate change	<ul style="list-style-type: none"> <li>• Wal-Mart's strategic initiative of "Going Green" has consisted of working directly with suppliers to reduce the environmental and climate-change impacts of the products the company sells to consumers. Wal-Mart assesses and proactively seeks to reduce its carbon footprint (and, simultaneously, its packaging costs) by dedicating both financial and human resources to the effort, realigning its operations and those of its suppliers to a more environmentally friendly and cost-efficient strategy. Beyond the environmental and financial benefits, Wal-Mart also stands to reap reputational rewards by improving its image among an increasingly eco-conscious public.</li> <li>• The World Wildlife Fund (WWF) "Climate Savers" programme is an initiative through which businesses voluntarily commit to reduce their greenhouse gas (GHG) emissions. WWF provides participating firms with implementation advice, assistance in setting reasonable yet effective emissions targets, and access to information-sharing with other firms. WWF and Sony co-sponsored the 2008 Climate Savers Conference, attended by Climate Savers members including Allianz, Hewlett-Packard, Nokia, Nike, and Tetra Pak. At the conference, 12 globally recognised companies signed the Tokyo Declaration, calling for a commitment by the international business community to reduce GHG emissions. The conference emphasised innovation in combating the causes of climate change, and highlighted partnerships between corporations, such as that between diabetes care provider Novo Nordisk and Danish energy supplier DONG Energy to invest in renewable energy production. By 2014, Novo Nordisk plans to use wind energy exclusively in its Denmark operations. The conference also provided a forum for firms to share their plans and best practices for reducing GHG emissions, paving the way for further collaboration on confronting this emerging risk.</li> </ul>
Health	<ul style="list-style-type: none"> <li>• Organisations working together to address gaps in the development or delivery of drugs and health services, and developing joint processes for achieving improved results and value for all parties.</li> <li>• Leading global pharmaceutical company Merck has partnered with the government of Botswana and NGO The Bill &amp; Melinda Gates Foundation to increase access to and coverage of HIV/AIDS treatment and support the sustainability of national response to the disease. Results are reflected in the percentage of the eligible population receiving treatment going from 5% to 90% in five years and AIDS-related mortality dropping by more than 50%.<sup>10</sup> While the margins remain low as compared to regular sales, the level of success creates significant impact on the brand.</li> </ul>

Source: PricewaterhouseCoopers, Wharton, and Eurasia Group

<sup>9</sup> Howard Kunreuther (Wharton School of the University of Pennsylvania) and Geoffrey Heal (Graduate School of Business, Columbia University), *Interdependent Security* (2006)

<sup>10</sup> World Economic Forum, Strategic Partner Corporate Global Citizenship Advisory Group Presentation (2008)

### 3.4 Routinely monitor emerging risks through effective use of leading indicators

To make risk-informed decisions, management should routinely analyse and track developments in its environment to identify potential exposures to emerging risks through analysis of past events and future trends. Such data may be structured or unstructured, quantitative or qualitative. In all cases, it should help elucidate unknowns and their potential impact on the organisation. It is important to solicit the input of relevant subject matter experts to validate findings.

Understanding the generalities of possible emerging risk events provides a starting point to monitor the symptoms of developing issues, which should be refined as further data becomes available to monitor and determine the need for alternative risk responses. Figure 3.4.1 provides an illustrative sample of such leading indicators in relation to several emerging risk areas. In addition, lessons learned should be captured in management information systems for analysis in relation to leading indicators, to further improve risk resilience.

The maxim “red sky at morning, sailor take warning; red sky at night, sailor’s delight” provides an example of such leading indicators. The sailor knows that a red sky in the morning is a bad sign, which should prompt him to verify available indicators such as barometric pressure. He should then know how serious the threat is and determine the best course of action, such as asking for more information or changing his course.

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**Monitoring emerging risk indicators helps to develop the organisational agility to address unknowable risks when they arise.**

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Key resources within any entity must be knowledgeable about objectives and potential threats to those objectives, long before they materialise. Adequacy of skills and resources in an organisation are key to ensuring that leading indicators are monitored on a routine and ongoing basis. In particular, organisations should:

- Link emerging risks to strategic business drivers
- Elicit input and analysis through an adequate mix of resources
- Revisit traditional risk indicators and controls in relation to changing market conditions
- Listen for “weak” market signals (or “whispers”) by investing in technical capability to monitor emerging risks
- Embed risk management lessons learned based on historical events
- Provide input into dynamic risk management strategies through improved relevant data and analysis

In addition to increasing the role of their human resources, organisations should make additional investments in technical capabilities to identify and monitor weak market signals and leading indicators of emerging risks. Forward-looking analyses enable organisations to identify and monitor emerging risk indicators, thus limiting the impact of unknown risks and developing the organisational agility to address unknowable risks when they arise. Considering both the interconnectedness of risks and also cross-organisational risk mitigation alternatives, such resources can help formulate dynamic risk management strategies in support of the achievement of organisational strategy and objectives.

<b>3.4.1</b>
Illustrative examples of emerging risk indicators

<b>Sample emerging risks</b>	<b>Illustrative examples of leading indicators</b>
Political risk	<ul style="list-style-type: none"> <li>• Policy instability or change</li> <li>• Government instability or change</li> <li>• Regime instability or change</li> <li>• Homeland Security Advisory System (threat level)</li> </ul>
Retrenchment from globalisation	<ul style="list-style-type: none"> <li>• Introduction of capital controls</li> <li>• Erecting barriers to trade or favouring domestic industry</li> <li>• Restrictive immigration policies or resentment toward or violence against immigrant groups</li> </ul>
Nationalisation/expropriation	<ul style="list-style-type: none"> <li>• Rising populist tendencies</li> <li>• Economy relies on a particular industry or sector</li> <li>• Souring of relations between the host government and the company's home-country government</li> </ul>
Financial/credit crisis	<ul style="list-style-type: none"> <li>• Macroeconomic indicators, such as increasing foreign debt, current account deficit, and/or government budget deficit, or interest rates</li> <li>• Market indicators, such as a rise in non-performing assets, asset price bubble, or market capitalisation</li> <li>• Financial management indicators, such as current ratio (ability to cover short-term liabilities) or cash on hand</li> </ul>
Energy prices	<ul style="list-style-type: none"> <li>• Geopolitical, environmental, or market events affecting energy producers (e.g., Middle East instability for oil, poor corn crops for ethanol)</li> <li>• Reserve levels or ability to produce energy (oil, natural gas, coal)</li> <li>• Consumption levels of oil and other energy sources (natural gas, coal, nuclear, hydroelectric)</li> </ul>
Extreme climate change related weather	<ul style="list-style-type: none"> <li>• Dramatic changes from normal precipitation and temperature levels</li> <li>• Significant rise in sea level</li> <li>• Failure of global coordination to mitigate carbon emissions</li> </ul>
Deadly disease epidemic	<ul style="list-style-type: none"> <li>• Influenza pandemic response</li> <li>• Extensively drug-resistant tuberculosis (XDR TB) spreads widely</li> <li>• Heretofore unknown virus (e.g. SARS) spreads widely</li> </ul>

Source: PricewaterhouseCoopers and Eurasia Group

~~Individual  
risk  
responses~~

Collaborative  
risk  
mitigation

## Section 4

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# Conclusion: Turning emerging risks into emerging opportunities

The events and circumstances that underlie emerging risks can also represent opportunities – and this realisation must inform an organisation’s strategic and operational thinking. Foresight and change agility are essential to risk resilience in an environment of rapid change.

Global competition and economic volatility leave little margin for error, and bad or unlucky business judgment can lead not just to bad performance but to failure. Conversely, effective anticipation of emerging risks can yield competitive advantage.

Existing business processes and structures can often be leveraged at minimal cost to add immediate enterprise value. Retailers with global supply chains may explore simulations where their networks could be leveraged by third parties to rush emergency aid to victims of natural catastrophes – a scenario that played out in Wal-Mart’s delivery of emergency relief to the US Gulf Coast after Hurricane Katrina struck in 2005. By leveraging its expansive supply chain, Wal-Mart played a crucial role, working with government agencies and non-governmental organisations in Katrina’s aftermath. Not only did Wal-Mart gain acclaim for its timely and effective response, but it also demonstrated the power of a connected response to a risk with networked repercussions.

Consider the strategic risk to entertainment and media companies posed by the advent of the mp3 digital music format and file-swapping software during the 21st century’s first decade. Given mounting losses and the illegal duplication of its key assets, the industry was faced with an emerging risk that threatened its core business model. A platform for collaboration was sorely needed, but did not appear until Apple Inc. developed a workable solution. What to one group of organisations was an emerging, strategic, and existential business imperative became for Apple a revolutionary opportunity. The advent of Apple’s iPod digital music player and the digital rights management originally embedded in its file format changed the face of the entertainment and media industry. Apple’s leadership assessed shifting consumer attitudes and the relative ineffectiveness of the major record labels’ offerings. Apple used this information to forge a collaborative business

relationship among major labels, resulting in the iTunes Music Store, which facilitates and dominates legal music distribution today.

Management of emerging risks should be viewed through a prism that encourages entities to capitalise on their inherent strengths. ERM efforts can be leveraged to provide a structure and process for analysing and tracking such risks, allocating resources, and determining adequate risk response strategies. Specifically, businesses should focus on demonstrating how their core activities help others manage their respective exposures to catastrophic risks. If advertised appropriately, organisations that participate in mitigating emerging risks have the potential to earn not only economic value but also significant goodwill.

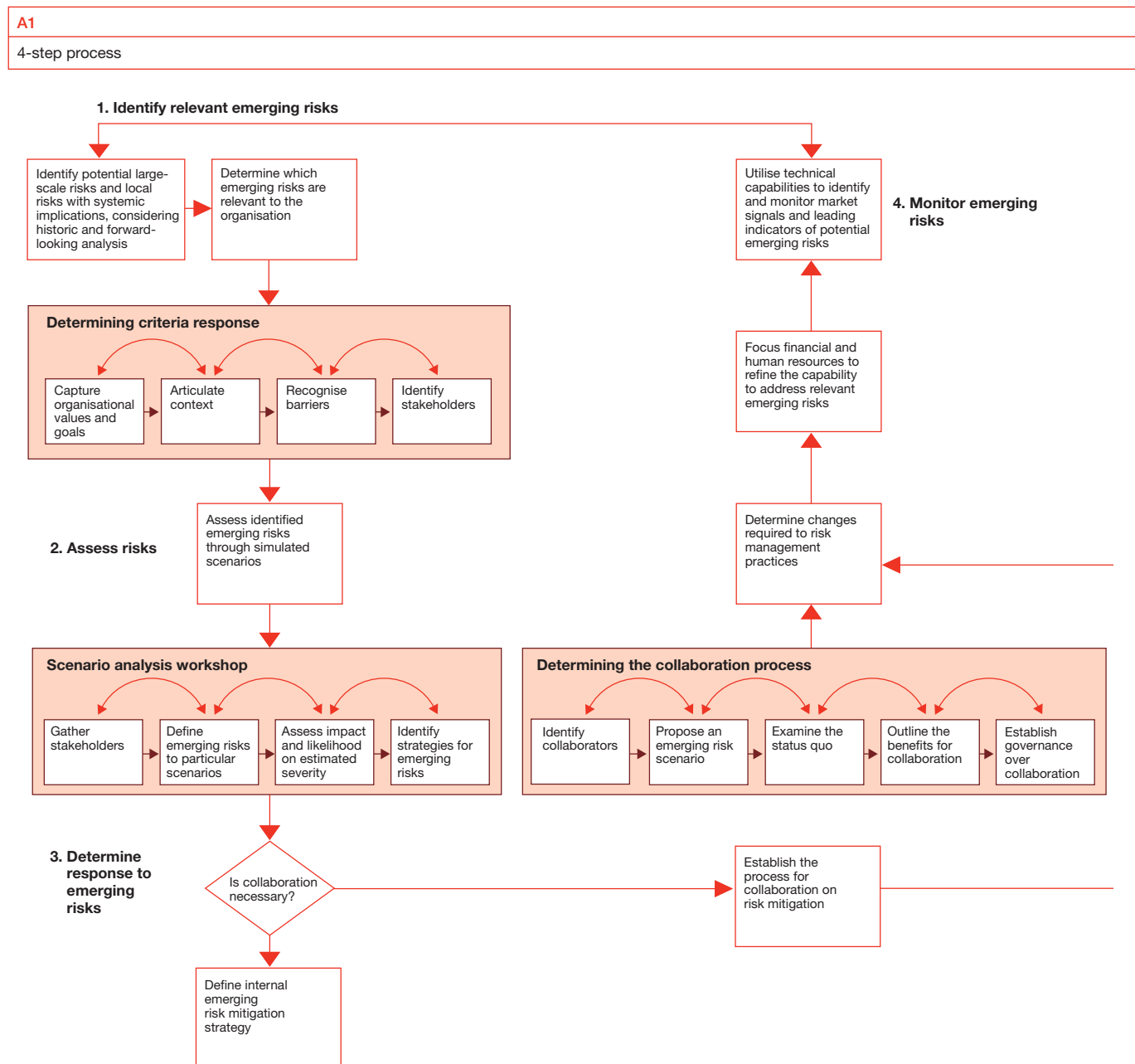
To improve their risk resilience, organisations are challenged to revisit, innovate, and refine as necessary each element of their risk management programme to ensure that:

- Potentially relevant emerging risks are identified and analysed systematically
- Assessment of these risks occurs periodically, involving the requisite expertise
- Risk responses are determined or revised as necessary, considering opportunities for collaboration with partners
- Adequate monitoring mechanisms are developed and tracked routinely

Embedding a focus on emerging risks in the culture of the organisation – and in the processes and tools used for planning, executing, and evaluating business performance – is essential to meeting stakeholder expectations in an environment of rapid change, where an organisation can prosper or vanish overnight.

## Appendix A

# Managing emerging risks using the ERM framework



Source: PricewaterhouseCoopers

## Appendix B

# Managing emerging risks: Case studies

### Case study 1: PepsiCo

#### Company background

PepsiCo is a world leader in convenient snacks, foods, and beverages, with revenues of more than \$39 billion in 2007 and over 185,000 employees. PepsiCo consists of three divisions: Foods, Beverages, and International. PepsiCo brands are available in nearly 200 countries and generate sales at the retail level of more than \$98 billion.

Some of PepsiCo's brand names are more than 100 years old, but the corporation is relatively young. PepsiCo was founded in 1965 through the merger of Pepsi-Cola and Frito-Lay. Tropicana was acquired in 1998 and PepsiCo merged with The Quaker Oats Company (which includes the Gatorade brand) in 2001. PepsiCo offers product choices to meet a broad variety of needs and preference, from fun-for-you items to product choices that contribute to healthier lifestyles.

PepsiCo states its mission "To be the world's premier consumer products company focused on convenient foods and beverages. We seek to produce healthy financial rewards to investors as we provide opportunities for growth and enrichment to our employees, our business partners and the communities in which we operate. And in everything we do, we strive for honesty, fairness and integrity."

#### Emerging risks on the radar

Key emerging risks identified and monitored by PepsiCo include:

- Access to quality raw materials such as freshwater
- Political risks (e.g., Venezuelan government's drive to nationalise private-sector assets)
- Food insecurity and security of the supply chain, which PepsiCo manages very actively, in collaboration with the World Food Programme
- Carbon emissions and climate change
- Inflation and the rising cost of factors of production, notably oil prices

#### Risk management generally and in relation to emerging risks

Risk management within the company is led by the Enterprise Risk Management (ERM) group.

The company is subject to risks in the normal course of business due to adverse developments with respect to: product demand, reputation, information technology, supply chain, retail consolidation and the loss of major customers, global economic and environmental conditions, the regulatory environment, workforce retention, raw materials and energy, competition, and market risks.

The company's risk management process is intended to ensure that risks are taken knowingly and purposefully. As such, it leverages an integrated risk management framework to identify, assess, prioritise, manage, monitor, and communicate risks across the company. This framework includes:

- Executive Council comprised of a cross-functional, geographically diverse senior management group which identifies, assesses, prioritises, and addresses primarily strategic and reputation risks
- Division Risk Committees comprised of cross-functional senior management teams, which meet regularly each year to identify, assess, prioritise, and address division-specific operating risks
- Risk Management Office, which manages the overall process; provides ongoing guidance, tools, and analytical support to the Council and the Committees; identifies and assesses potential risks; and facilitates ongoing communication between the parties, as well as to the Audit Committee
- Corporate Audit, which confirms the ongoing effectiveness of the risk management framework through periodic audit and review procedures

To stay abreast of known risks but also emerging risks, the company continues to drive risk mitigation focus to where risks can be most efficiently and effectively managed, and reinforce ownership and accountability for risk management within the business. It also explores opportunities to collaborate with partners to achieve common goals. Some highlights include:

- With respect to product demand, the company continues to focus on the development of products that respond to

consumer trends, such as consumer health concerns about obesity, product attributes, and ingredients. Actions include reformulating products to lower sugar, fats, and sodium; adding ingredients that deliver health benefits; and expanding its offering of portion-controlled packages. PepsiCo continues to focus on marketing its products in ways that promote healthier lifestyles, promoting healthy energy balance through its national sponsorship of America On the Move.

- Coordination of division-led product integrity efforts through the creation of a company-wide, cross-functional Product Integrity Council to share leading practices and confer about areas of potential risk.
- Enhanced internal IT infrastructure through consolidating and updating technology and retiring older technology, as well as improving its information security capabilities.
- Business process transformation initiatives to help remain in step with the changing needs of customers and drive effective risk management and quality processes.
- Assessment of capability to mitigate potential business disruptions and evaluation of an integrated approach to business disruption management, including disaster recovery, crisis management, and business continuity.
- A compliance and ethics leadership structure in place.
- Human resource programmes focused on diversity and inclusion, leadership development, succession planning, and employee work-life flexibility, and aimed at hiring, developing, and retaining a talented and motivated workforce.

The company has a total of nine risk categories it currently monitors and controls, including business disruption, which considers scenarios of catastrophic risks (e.g., site safety, fires, etc.) championed by the Global Security group.

The company is going through a paradigm shift, with a strong shift toward managing risks with global (international) dimensions. Annual global security simulations are conducted in support of the business continuity plans. To effectively manage global risks, the tone has to be set at the top. Variations in the risks that are relevant based on regional, geographic parameters are natural; however, the message has to come from the top. Getting risk management objectives down to the division level and interpreting what they mean is an important part of the overall equation.

## Case study 2: ArcelorMittal

### Company background

ArcelorMittal is the world's number-one steel company, with revenues of more than \$105 billion in 2007, over 320,000 employees, and operations in more than 60 countries. It has led the consolidation of the world steel industry and today ranks as the leading global steelmaker. It is a leader in R&D and technology, holds sizeable captive supplies of raw materials, and operates extensive distribution networks. Its industrial presence in Europe, Asia, Africa, and America gives it exposure to all the key steel markets, from emerging to mature, supporting various sectors, including automotive, construction, household appliances, and packaging. ArcelorMittal seeks to develop positions in high-growth markets such as China and India.

ArcelorMittal is committed to setting globally recognised standards with the needs of future generations in mind, with particular focus on:

- **Sustainability**

The company seeks to take a lead role in the evolution of steel to secure the best future for the industry and for generations to come. The commitment to the global community extends beyond the bottom line.

- **Quality**

As quality outcomes depend on quality people, the company seeks to attract and develop the best people to deliver superior solutions to customers.

- **Leadership**

Its entrepreneurial spirit has brought the company to the forefront of the steel industry and continues to drive developments beyond what the world expects of steel.

### Emerging risks on the radar

- Increasing natural resources constraints (e.g., energy, water)
- Declining quantity and quality of raw materials
- Climate change and carbon emissions reductions
- Disruption of economic conditions and access to financing for the industry and stakeholders like customers, suppliers, and service providers
- Liability regime in environment and human health area
- Political risks and retrenchment of nations from the global economy
- Nanotechnology that could revolutionise certain industries and develop substitution or inter-material competition
- Access to talent in the industry after many years of slow growth and limited career prospects
- Slowing of developing countries like India or China
- Compliance issues and their impacts on reputation

### Risk management generally and in relation to emerging risks

Risk management at ArcelorMittal is owned by the management and ultimately overseen by the board. Accountability for identifying, assessing, and managing risk, including emerging risks, lies with the business units. This bottom-up approach is completed by a strategic risk assessment done at group level and with a more distant time horizon. The whole process is facilitated by the Corporate Risk Management Team, which reports to the Group Management Board, with the support of a network of risk correspondents located in the business.

The company has adopted a risk management policy and standards that provide a framework and define expectations for managing risks within the company. It is based on leading frameworks as well as external and internal best practices. The policy and standards are regularly reviewed to ensure compliance with local legal requirements. They are intended to provide for decentralised decision making in line with corporate risk management expectations.

The risk management cycle comprises four key steps which are expected to be performed as part of ongoing activities and form an integral part of the decision making processes: identification of potential events that could present risks or opportunities in relation to business objectives; assessment of risk using a combination of top-down and bottom-up approaches; treatment of risks; and monitoring of risks through the use of various internal and external indicators.

Risks are categorised into business risk, event risk, financial risk, and operational risk. The major risks are captured in a risk register that is updated quarterly with an assessment of current exposures, future trends, and mitigation actions undertaken; this is reviewed in detail as part of the annual budgeting process.

Identification of risks captures management perspectives which are informed by internal and external data and interactive dialogue – for example, participation in industry discussion forums, scenario analysis workshops held as part of annual planning exercises (particularly to discuss emerging risks and explore what could be done differently to manage these risks more effectively), and country profiles performed prior to entering a new market.

Risks are assessed in terms of impact and likelihood of occurrence, using a combination of qualitative and quantitative factors. Scenarios are simulated to assess the impact on the company's objectives and what emerging risks may be relevant to the organisation.

The company recognises interconnectedness among many of its key risks and therefore tries to capture correlations between risks, at least in qualitative terms. For example, an increase in protectionism can cause an increased difficulty in accessing talent, which in turn can affect the level of innovation and company growth. Moreover, the slowing Chinese economy, Middle East instability, failed/failing states, and interstate/civil wars would individually impact the company but together could have a compound effect on the company, its assets, and supply chain that may be located in those locations.

Early-warning indicators help the company to monitor emerging risks, using macroeconomic trends and other relevant data, updated at least semi-annually. A strategic risk committee, composed of four senior executives and chaired by the Head of Strategy, analyses how these emerging risks can affect the group, determines what opportunities are associated with the risk, and assesses the adequacy of the proposed strategic response.

Risk reporting occurs as part of performance reporting, with significant risks being reported by the different businesses and functions on a regular basis to understand the adequacy of the risk management activity and evaluate the effectiveness of the business continuity plans. Reporting includes a monthly process for analysing significant events that occurred during the month from a risk management perspective, root causes of those events, and mitigation actions taken. On a quarterly basis, such risk information is presented to the Group Management Board and the Audit Committee. Typically, the financial impact is assessed within a one-year horizon. It remains a challenge to focus attention on emerging risks with more remote likelihood ratings and/or insufficient supporting data.

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