Section Nine
Guidelines for Scenario Analysis of Disruptive Risks

James Lam/James Lam & Associates

Directors can use this tool to inform the development of scenario-planning exercises involving the board and senior management.

SCENARIO ANALYSIS: OVERVIEW

As discussed in the 2018 NACD Blue Ribbon Commission report, most traditional enterprise risk management (ERM) processes are not well-designed to measure and manage disruptive risks.[1] This is in part due to the fact that common risk quantification methods used in ERM analysis—such as earnings-at-risk, value-at-risk, and economic capital models (see sidebar, Standard ERM Models)—generally measure potential loss within a 95 percent or 99 percent confidence level. Disruptive risks, on the other hand, are often "fat tail events" that may have much less than a 1 percent probability of occurrence, and thus may not be covered in typical ERM analysis and reporting even if they have the potential to destroy the company (see Figure 1, Tail Risks). This gap can result in critical blind spots for members of the board and executive management.

STANDARD ERM MODELS

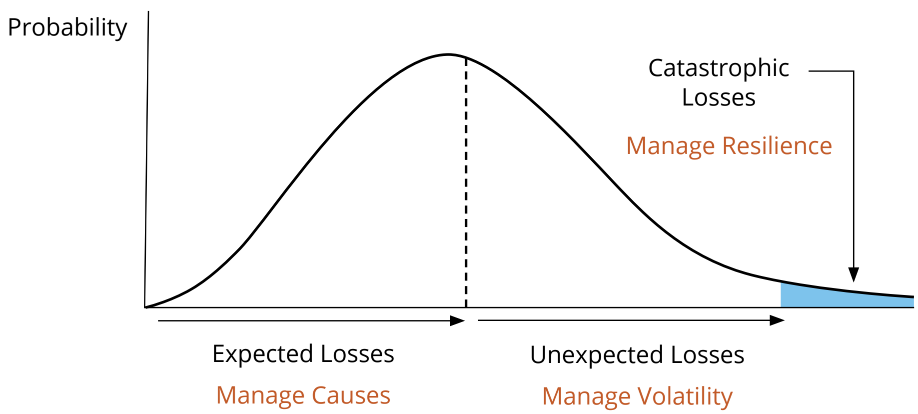
Risk quantification models used in traditional ERM programs generally measure how changes in risk factors (e.g., interest rates, sales volume, profit margins) can impact an important financial metric within a confidence level (e.g., 95 percent or 99 percent) and a time period (e.g., a day, a month, or a year). They include models such as these:

- **Earnings-at-risk (EaR) models** that measure the impact on the company's quarterly or annual earnings
- **Cash flow-at-risk (CFaR) models** that measure the impact on the company's cash flow coverage ratio or liquidity position
- **Value-at-risk (VaR) models** that measure the impact on short-term (e.g., one-day or five-day) mark-to-market valuation
- **Economic capital (EC) models** that measure the impact on intermediate- or long-term (e.g., one year or more) intrinsic enterprise value

[1] NACD, Report of the NACD Blue Ribbon Commission on Adaptive Governance: Board Oversight of Disruptive Risks (Arlington, VA: NACD, 2018), p. 7.

FIGURE 1:
TAIL RISKS

Economic Loss Distribution



This chart illustrates an economic loss distribution. While traditional ERM models quantify expected and unexpected losses within a defined confidence level, disruptive risks often live in the tail but can produce catastrophic losses. Moreover, the focus of management actions for these types of losses can vary. For expected losses, management needs to understand root causes, reduce expected losses over time, and incorporate them into pricing for loss recovery. With unexpected losses, management needs to measure volatility, implement hedging programs, and ensure capital adequacy. For catastrophic losses, management needs to implement insurance strategies, as well as develop contingency plans to enhance the company's resilience and protect its reputation.

Source: James Lam & Associates. Used with permission.

Scenario analysis can be a valuable tool to help companies put a spotlight on these types of hidden disruptive risks (and can also illuminate opportunities for the company itself to capitalize on disruptive change). To maximize the benefits of scenario analysis, companies should leverage the diverse backgrounds, experiences, and expertise of the board. With board and executive management collaboration, the process has the potential to go beyond quantification of potential loss to generate strategic insights on the key performance and risk drivers that may have a significant impact on the company. More importantly, senior leadership can develop an agreed-upon set of trigger events—early-warning indicators that show when responsive action is required—and associated action plans to initiate disruptive innovations and/or respond to competitive threats.

The desired outcomes and benefits of scenario analysis include these:

- **Board/management alignment.** Based on thoughtful analyses and discussions of the various scenarios, the board and executive team can establish, or reinforce, agreement on the strategic imperatives for the company. Importantly, this process often results in a timely reexamination of the company's risk appetite and capacity for risk-taking.

- **Scenarios to watch.** These are a limited number of scenarios that may represent existential threats (or opportunities to initiate a significant positive change in competitive position) for the company. These scenarios are not meant to be comprehensive, but rather representative of the relevant range of future business environments.
- **Early-warning indicators.** These metrics would provide clear signals that the company should pay attention, and possibly take action, because either one of the specific scenarios is materializing, or it is likely that a heightened risk environment is around the corner.
- **Action triggers and plans**. Inertia is the enemy of timely and bold actions. By developing action plans relative to disruptive risks and opportunities, the company can adapt to its business environment by shortening the time between action and reaction (e.g., ensure sufficient capital is available to cover potential loss or make major investments).
- **Enhanced reporting and monitoring.** These specific scenarios, early-warning indicators, and other metrics can provide useful content to board and management-level reporting. Risk reports are often internally-focused and backward-looking. Outputs from scenario analysis add externally-focused and forward-looking information.

SCENARIO ANALYSIS: A CASE STUDY

This section describes an application of scenario analysis at a public company where the ERM team, executive management, and the board collaborated on a series of so-called "black swan workshops." As preparation for the workshop discussions, board members and senior executives were each asked to consider the key questions in the sidebar, Scenario Development Workshop Questions. The strategic planning and ERM teams worked collaboratively throughout the process to support the board and senior management with integrated analysis and reporting.

FIGURE 2
SEVEN STEPS OF SCENARIO ANALYSIS FOR DISRUPTIVE RISKS

Source: James Lam & Associates. Used with permission.

The key steps in the process were as follows:

1. Industry-competitive analysis. Based on a SWOT (strengths, weaknesses, opportunities, and threats) analysis framework, the company refreshed its assessment of its current competitive position and future strategic drivers. The strategic planning and ERM teams focused on key industry, regulatory, technology, social, economic, and geopolitical trends that could have a significant impact on the company's long-term value. This assessment provided the "big picture" and *outside-in* view for the board and management.

2. Enterprise risk analysis. The key trends identified in the industry-competitive analysis were used to update the input data in the company's risk assessments and quantitative models. This analysis included the following:

- A reassessment of the top 10 enterprise risks facing the organization given its business model and strategy
- Statistical analysis of the range, volatility, and correlation of key variables and assumptions used in the risk models
- Risk-adjusted profitability and economic value added by business segments (i.e., business units, customer groups, products, and markets)
- Quantification of key earnings and intrinsic-value drivers based on earnings-at-risk and value-at-risk models

This assessment provided the quantitative, *inside-out* view on the company's current and projected risk profiles.

3. **Scenario Development & Analysis.** By connecting the dots between the outside-in competitive analysis and the inside-out risk analysis, the company gained important insights into key industry trends and drivers of long-term profitability and value. These insights helped the strategic planning and ERM teams to identify five scenarios that had the potential to destroy the company:

a. A disruptive technology that would fundamentally change the industry supply chain
b. Major shifts in customer preferences and buying habits
c. Regulatory changes impacting the compliance costs and capital requirements for the business
d. Geopolitical risks (including trade wars) that would reduce international revenues by 50 percent
e. A major cyberattack that would result in business interruptions, data theft, customer exits, and financial and reputational loss

The strategic planning and ERM teams also identified five scenarios that could have a significant *positive* impact on shareholder value:

a. Extremely high ("Blow-out") success of one to two of its incubator businesses or strategic partnerships
b. New business and technology investments given gains from the new tax law
c. The bankruptcy or exit of one of its top three competitors
d. A merger-of-equals that would produce significant revenue and expense synergies
e. Massive regulatory change, including requirements for greater consumer transparency, which would benefit the company's long-established conservative management and business integrity

4. **Board/Management Workshops.** The company held a series of three half-day workshops to review the input and output of the scenario analysis. See sidebar, Scenario Development Workshop Questions, for the session prework. The first workshop was performed between the strategic planning and ERM teams to integrate their analyses and perspectives. The second was with the executive leadership team with a focus on the company's strategy and risk appetite. The third was conducted with the board and select members of management, as part of the annual off-site strategy session, to gain the board's perspectives and challenge of management's assumptions.

The discussions and decisions in the workshops produced the following deliverables:

- **Risk governance**–authorities were assigned to individuals, functions, and management and board committees to develop and approve key decisions.
- **Risk methodology**–responsibilities were assigned to maintain the industry competitive, enterprise risk, and scenario analyses discussed above.
- **Risk appetite and reporting**–management was asked to make changes to the risk-appetite statement, as well as to incorporate new metrics into board and management-level risk reports.

SCENARIO DEVELOPMENT WORKSHOP QUESTIONS

To establish the business context and discussion points for scenario analysis of disruptive risks, the board and executive team members were each asked to consider the following questions:

- What disruptive events have occurred in our industry or adjacent industries? What lessons learned, including early-warning signals or red flags, can we capture?
- What are the top three positive bets and top three negative bets embedded in our business model and corporate strategy?
- If you were not constrained by human and financial capital (i.e., dream team, deep-pocket funding) what start-up would you create to disrupt our industry?
- If we had the mandate to increase our market value by a factor of 10 in three to five years, how would we change our business model and strategy? What aspects of our culture and risk appetite would be barriers?
- What are the most critical assumptions and beliefs underpinning our continued success?
- What are the key changes in risk correlations that would have the most impact on our long-term value?
- How can we enhance our risk prediction and scenario planning capabilities through the use of technologies such as big data, data analytics, and artificial intelligence? Moreover, how can we enhance our culture and processes so we become more adoptive and resilient?

5. **Early-Warning Indicators.** For each scenario, the board and management established a few early-warning indicators to signal to the company that one of the previously-identified scenarios is materializing. However, the company also recognized that it is unlikely that any specific scenario would unfold exactly as predicted. Therefore, a set of general early-warning indicators were also developed to signal that the overall risk environment is increasing. For each indicator, the board and management agreed on specific "trigger points" that would indicate that the company should continue monitoring (green), review and investigate (yellow), or consider taking action (red).
6. **Action Triggers and Decisions.** Based on the early-warning indicators and trigger points, management developed strategic options for the company to consider at both the corporate and business-unit levels. The company recognized that the discipline required in this step represents the difference between informative analyses and value-creating decisions.
7. **Monitoring & Reporting.** The industry intelligence, enterprise risk analyses, and early-warning indicators were incorporated into monthly management reports and quarterly board reports. This content provided externally-focused and forward-looking information (see Section Ten of the Toolkit for additional detail).

After the first cycle of scenario analysis discussed above, the company decided to formalize the process. Executive management included this assessment as part of its quarterly strategy reviews and engaged the board as needed. Interestingly, within six months the company decided to exit one of its major lines of business because a previously-identified scenario indicating unsustainable economics was materializing. The scenario analysis process allowed the board and management to reach this decision on a much timelier basis than would have otherwise been the case.

Section Ten
Sample Board-Level Reporting: Scenario Analysis and Disruptive Risks

James Lam/James Lam & Associates

Directors can use this tool to benchmark the structure and content of board-level reporting related to disruptive risks.

BOARD-LEVEL RISK REPORTING

The 2018 NACD Blue Ribbon Commission encourages the use of scenario analysis to help the board and management team identify and assess disruptive risks.[1] To support ongoing monitoring and reporting, companies may consider developing a dedicated dashboard that can help aggregate, analyze, and display the scenario analysis data, and other information about disruptive risks, in a concise and effective manner.

The following reporting components may be included in the scenario analysis dashboard (example depicted in Figure 1):

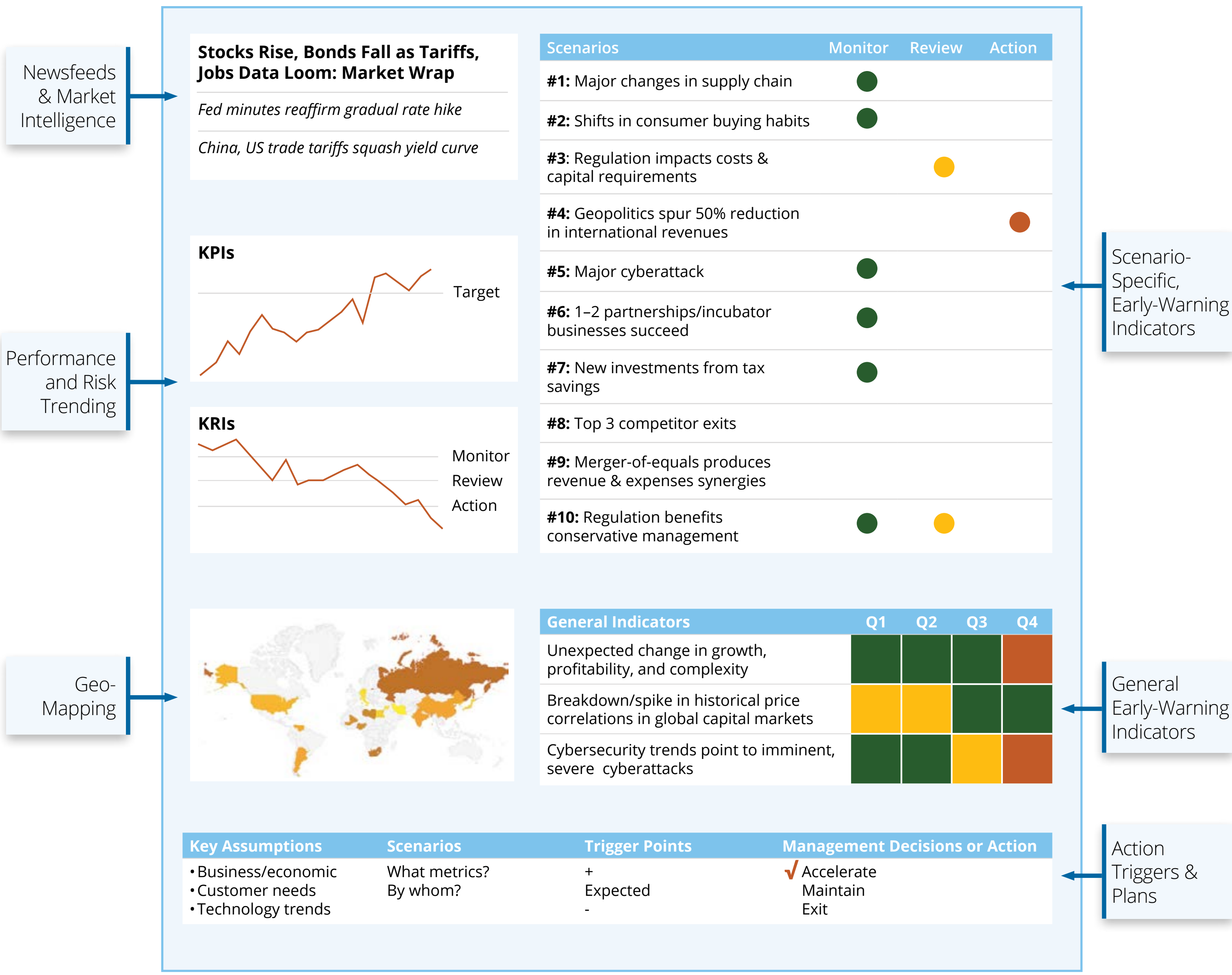
- **Newsfeeds and market intelligence** that provide key business and industry developments, consumer and technology trends, competitive actions, and regulatory updates.
- **Performance and risk trending data** that tracks key performance indicators (KPIs) and key risk indicators (KRIs) for disruptive risks. For example, a KPI for disruptive-technology risk might be the relative valuation of new tech-based start-ups versus incumbent firms. An increase in that ratio would indicate start-ups are rapidly creating more value than incumbents. A KRI might be the relative investment capital available to those start-ups as compared to incumbent firms. An increase in that ratio would indicate start-ups have the capacity to invest more aggressively.
- **Geo-mapping data** that shows global "hot spots" for economic, political, regulatory, and social instability. This would also help to highlight company-specific operational risks such as third-party vendor, supply-chain, and cybersecurity issues.
- **Scenario-based early-warning indicators** that show risk levels against trigger points with green/yellow/red signals. These signals would indicate the degree to which a previously-identified scenario is materializing, thus prompting a discussion about whether the company should continue to monitor, review and investigate, or consider taking more direct action.

[1] NACD, Report of the NACD Blue Ribbon Commission on Adaptive Governance: Board Oversight of Disruptive Risks (Arlington, VA: NACD, 2018), p. 22.

- **General early-warning indicators** that may signal an increase in overall risk levels, even if no specific scenario is clearly emerging. Here are some examples of general early-warning indicators, and what they may foreshadow:
    - Unexpected change in growth, profitability, and complexity may indicate greater business and operational risks.
    - An inverted yield curve may indicate that a recession is around the corner in the next 12–18 months.
    - Breaks or spikes in historical price correlations in the global capital markets may indicate market uncertainties and impending liquidity shortages.
    - Cybersecurity trends from the government intelligence agencies and the "dark web" may indicate that more severe cyberattacks are imminent.
- **Action triggers and plans** that provide the key discussion and decision points for management and the board. These trigger points and contingency actions should be developed and maintained as part of the scenario-analysis process.

In addition to the reporting components discussed above, dashboard tools should provide drill-down capabilities that enable board members to access more granular information and analyses (e.g., by risk scenario, risk or performance metric, region, business unit, etc.) and associated action plans.

FIGURE 1
SAMPLE SCENARIO ANALYSIS DASHBOARD



Source: James Lam & Associates. Used with permission.