

EMERGING RISK MANAGEMENT: *DEVELOPMENTS IN RISK IDENTIFICATION AND CRISIS MANAGEMENT*

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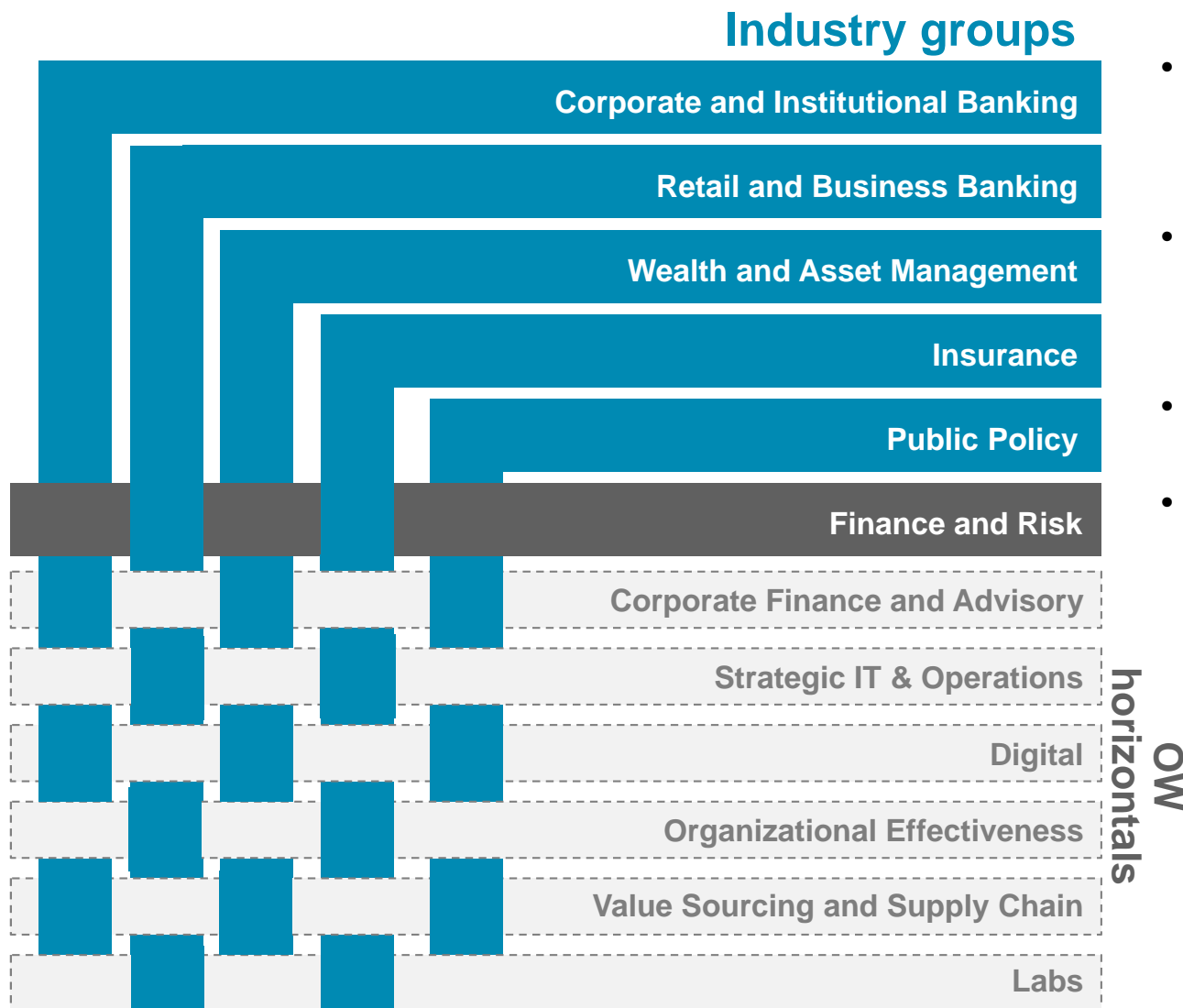
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1 | About Oliver Wyman

Oliver Wyman's Financial Services practice group brings deep industry expertise and broad functional capabilities to leading financial institutions



- Oliver Wyman's Financial Services practice group has over 210 Partners dedicated to the financial services industry internationally
- We have an unparalleled understanding of the market structure, economics, and possible future development of all segments of the financial services industry
- Last year we executed over 1,600 projects globally in more than 60 countries
- 90% of our business is from repeat clients, who include
 - Over 75 of the top 100 global financial institutions
 - Regulatory and government agencies
 - Top private equity firms

Finance & Risk is a clear focus area within Oliver Wyman – it is our largest Financial Services practice

1000+

OLIVER WYMAN EXECUTED PROJECTS
IN FINANCE AND RISK PRACTICE
SINCE 2014...

Key Areas of Insight

The Finance and Risk practice provides leading financial institutions with custom solutions covering all aspects of risk management, including its application to financial management

Finance

- Strategy development for interest rate risk management
- Liquidity forecasting and limit calibration
- CCAR balance sheet and PPNR model development, including linkage to annual financial planning
- Performance management and target operating model definition

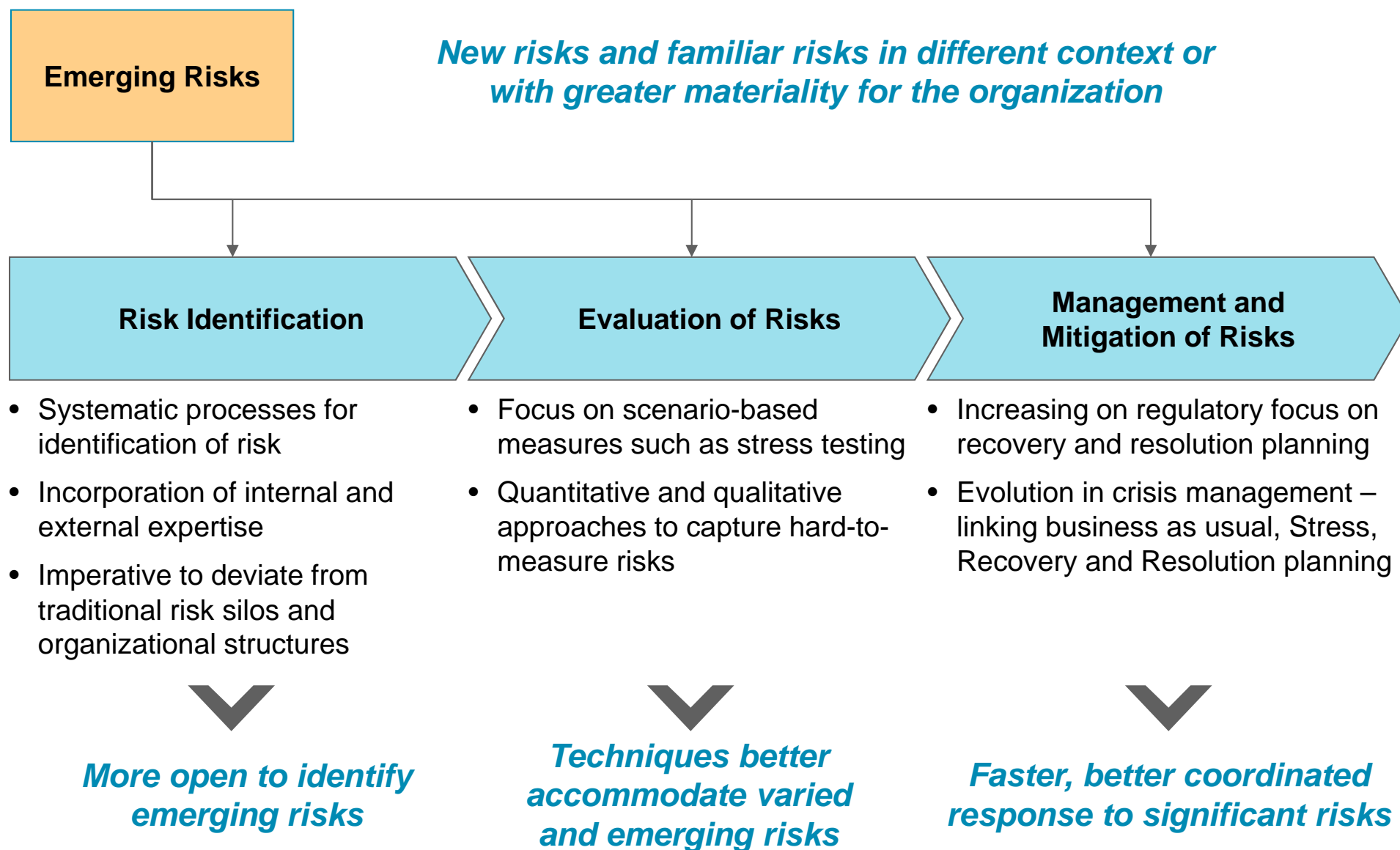
Risk

- Redesign of capital management frameworks
- Development of a roadmap for stress testing and capital management
- “Regulatory remediation” projects as direct answer for audit findings (e.g., model validation, risk processes etc.)
- “Readiness support” projects incl. development of capital plans in line with regulatory guidance
- Development of standards for CCAR models and effective challenge frameworks covering annual stress testing activities for regulatory submission

About 40% of our project work in FS is related to Finance & Risk topics

2 | Introduction

Risk management techniques are evolving to better address emerging risks



3 | Risk Identification

Institutions failed to fully anticipate many of the risks observed during and since the financial crisis

Materialization of new and increasing risks

Why Home Prices May Keep Falling

Wells Fargo Unit Ordered to Buy Back Auction-Rate Securities

Mor **Buck Broken**
Stanley
used \$23bn to
prop up funds

Homeowners Walking Away

Outrage Over Wall St. Pay

Examples of risks missed or underestimated

- Repurchase risk – banks were made to buyback loans with misstated risks
- Ratings downgrade related risks
- Risk of “strategic defaults” – homeowners walked away from underwater properties
- Failure of key funding markets
 - Freeze in commercial paper market
 - Haircut widening and runs in the repo markets
- Reputational risks from banker remuneration and government interventions

Pre-crisis risk identification processes were insufficiently granular and dismissed or ignored risks that were deemed too improbable

Legacy industry approaches for risk identification have not been designed considering the evolving approaches for capital management

Common characteristics of legacy industry Risk Identification

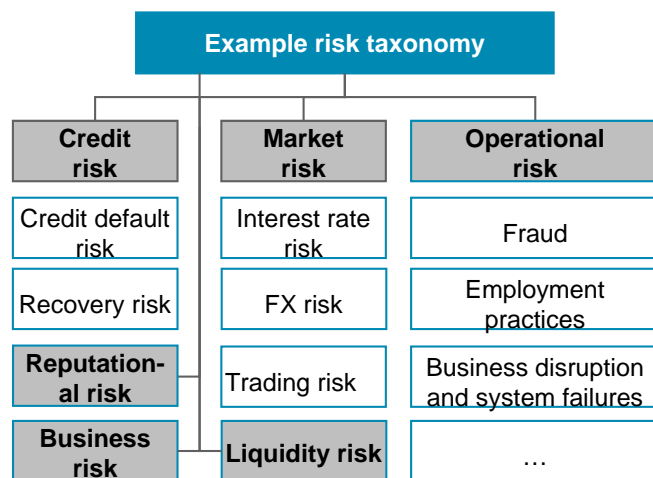
- Typically high-level description of risks
 - Risk taxonomy or hierarchy is used to categorize risks at a high level – which is useful for economic capital modeling and regulatory capital
 - Individual events or external drivers of the losses given limited consideration for some risk categories
- Approaches often narrowly involve only a small part of the organization
 - Often centrally-executed approach, with limited input from business areas with granular knowledge of risks
 - Limited discussion of risk drivers through risk committees and involvement of senior executives
- Lack of standardized approach to assess materiality
- Focus on readily quantifiable risks and difficult to quantify risks and business risks often not explored
- Granular “Risk and Control Self-Assessment” (RCSA) approach more narrowly geared toward operational risk
 - While the RCSA process is more granular and distributed, it mostly supports operational risk measurement and risk control with less feedback into financial risk management



Legacy industry Risk Identification approaches failed to capture a number of risks and do not effectively support scenario development – an activity critical for stress testing

Legacy approaches to risk identification are also insufficient to support the new set of tools used for risk and capital management

Legacy approaches to risk identification focused on defining major categories of risks



- Risk identification largely synonymous with “risk taxonomy”
- Supported the two main risk measurement tools at the time: regulatory capital and economic capital

After the crisis, stress testing became the preferred approach to measure capital needs

- Two main approaches to determine capital needed to protect against unexpected losses:
 - Regulatory capital – set by regulators
 - Economic capital – self-determined by institutions
- The crisis showed that these approaches were not successful
- Stress testing became the preferred tool for capital management
 - Require explicit stress scenarios unlike economic capital and regulatory capital
 - Developing “right” stress scenarios is critical and requires detailed understanding of an institution’s risks and vulnerabilities

Legacy approaches to risk identification are insufficiently granular and comprehensive to tailor stress scenarios that probe an institution’s vulnerabilities

In order to effectively support risk management, several key features are needed in a modern risk identification process

Analytical features

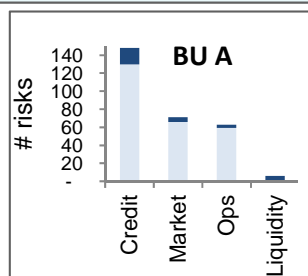
Comprehensiveness

1. Identifies risks across the firm's activities
2. Distinguishes material risks
3. Measureable and "hard to quantify"
4. Established and emerging risks
5. Includes on- and off-balance sheet risks
6. Includes even very low probability risks



Risk driver based view

7. Describes granular risk events/drivers to support scenario design
8. Relates events to business activities
9. Relates back to taxonomy of risk types



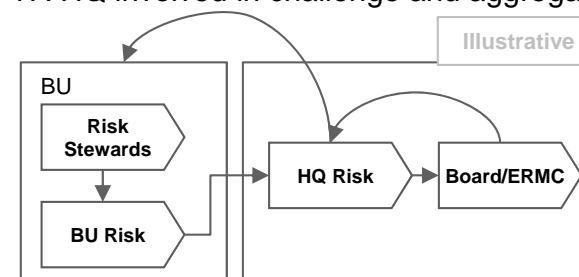
Other analytical requirements

12. Systematic and repeatable process for consistent output
13. Consistent framework for materiality across all risk types
14. Common standards applied across BUs to aggregate and compare results
15. Supported by empirical data where possible

Operational features

Roles and responsibilities

15. Board and ERM regularly involved
16. BU involved in granular risk identification
17. HQ involved in challenge and aggregation



- Identify granular risks
- Identify risk drivers
- Identify top firm risks
- Identify risk interactions
- Challenge and oversight
- Aggregation

Documentation and controls

18. Comprehensive documentation
19. Regular challenge throughout

Timing and frequency

20. Up-to-date results for capital planning process

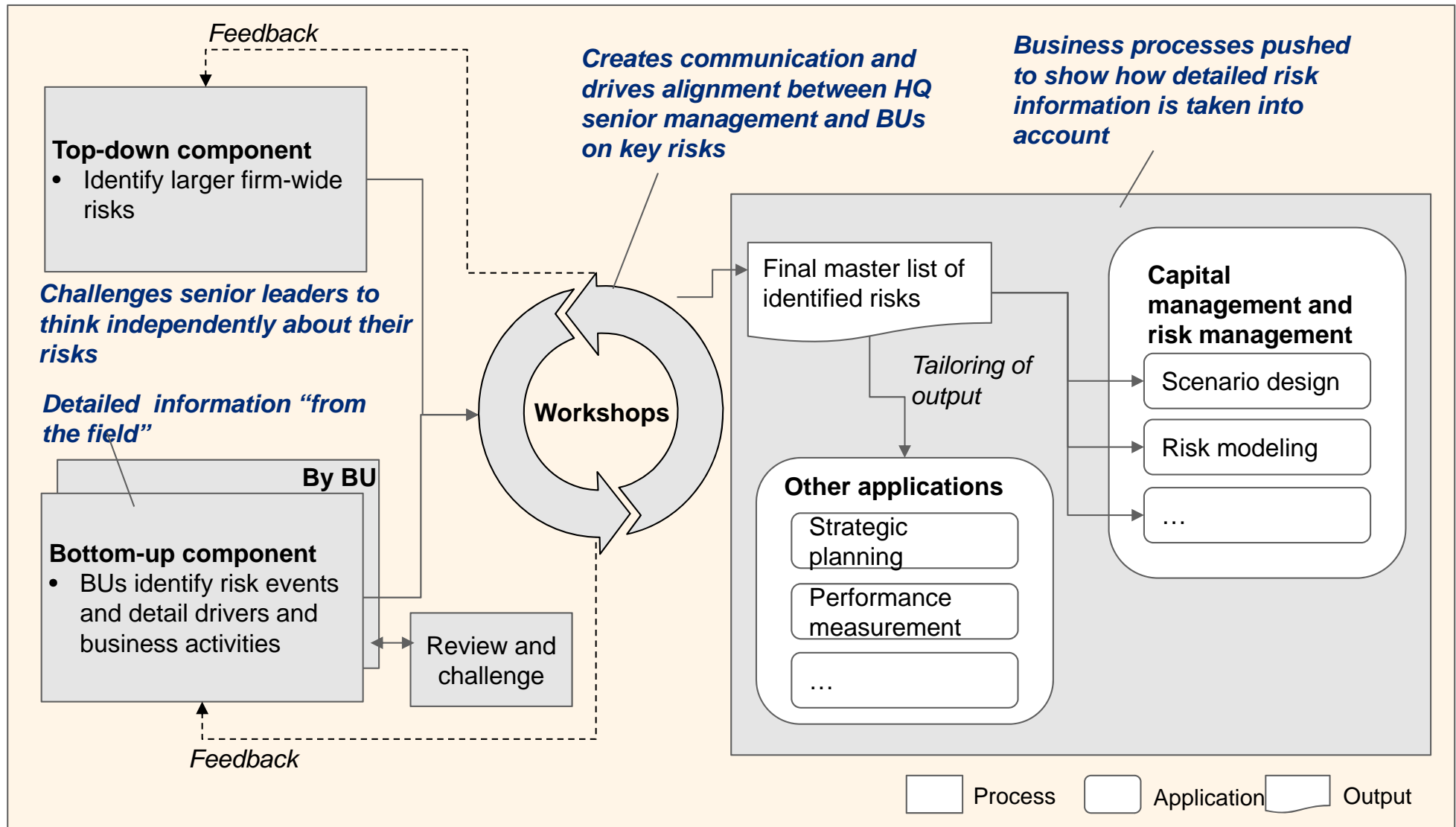
Key challenges for risk identification processes

#	Challenge
A	Achieving organizational engagement
B	Linkage of risk identification to existing risk infrastructure
C	Designing a process that identifies new and emerging risks
D	Developing a robust materiality assessment framework
E	Ensuring consistency in risk identification across the organization
F	Considering both position-driven and business activity-driven risks
G	Effectively linking risk identification output to scenario design

☐ Discussed on subsequent pages

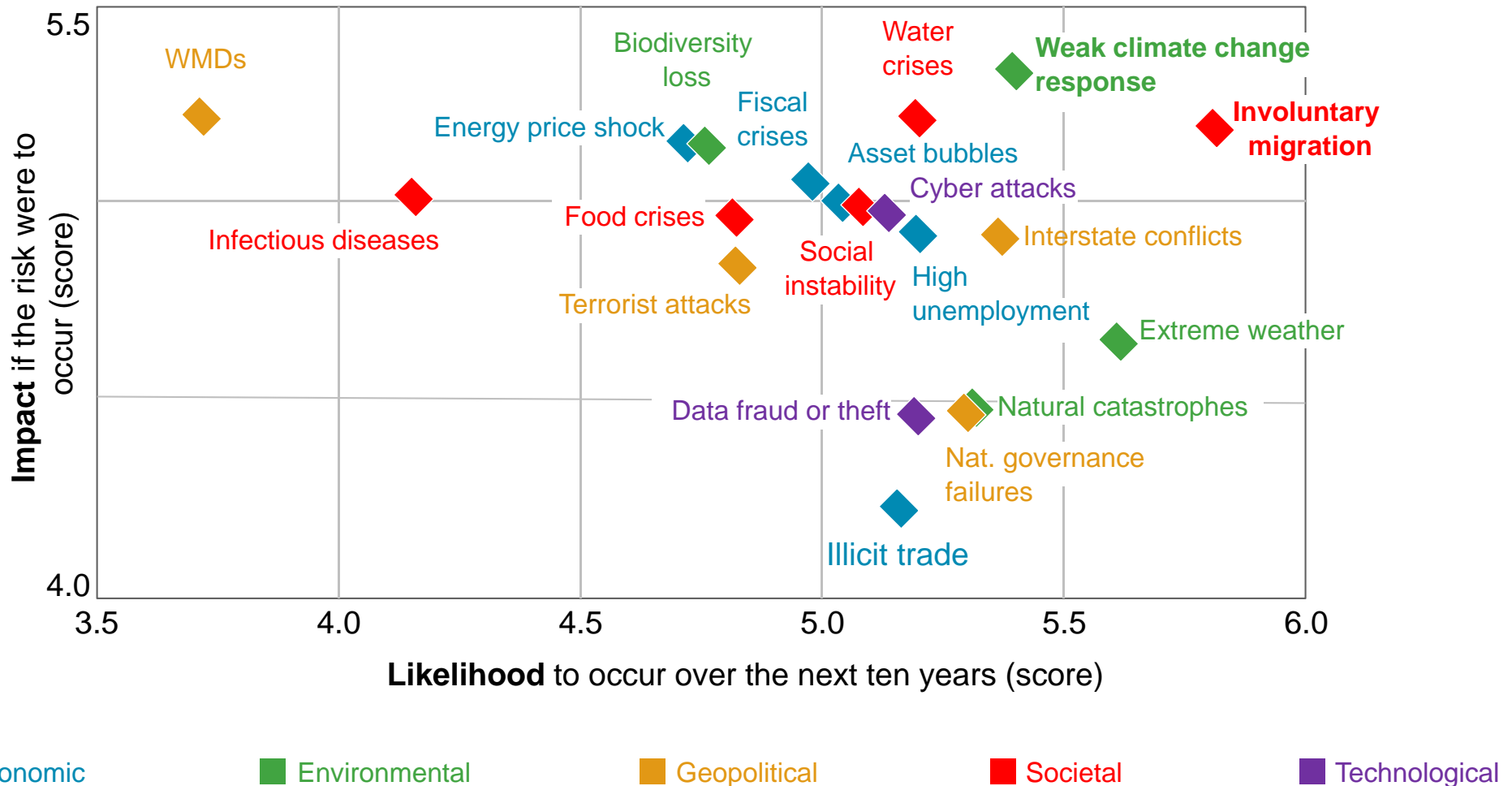
- © The risk identification process should be designed to achieve cross-organizational involvement and result in a detailed, comprehensive list

Illustrative



- External views of risk can be incorporated into risk identification workshops to create discussion of emerging risks and challenge internal views

Risk landscape – Top risks



Note: Entire scale is from 1-7. Top 20 risks in terms of overall impact and likelihood are shown

Source: World Economic Forum, *Global Risks Report 2016*

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D Risk identification includes an assessment of the materiality of risks that can highlight which risks are emerging

Components

Description

Likelihood

- Likelihood of risk event occurring e.g. 1 in 10, 1 in 25 etc.
- The likelihood assessment will differ across types of risks:
 - “Discrete risks”: those a relatively fixed outcome, e.g. power plant explosion
 - “Continuous risks”: those with continuous spectrum of likelihood and severity (e.g. increasing interest rates)

Impact

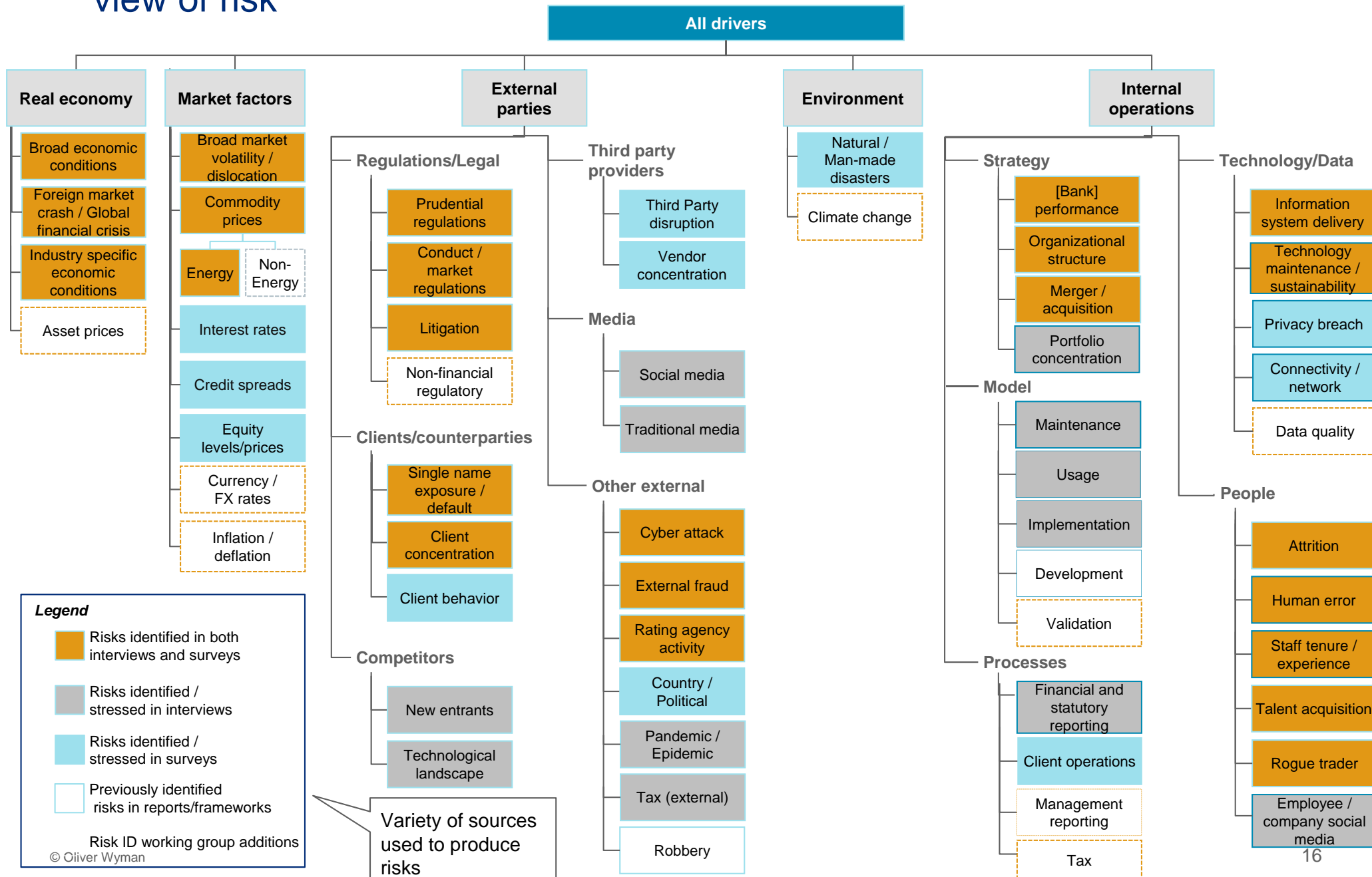
- Financial impact assuming the risk event occurs
 - May considers short term P&L impact as well as longer term value impact
- Typically considers non-financial or indirect impacts e.g. reputational impact

Trend

- *Captures the past or expected change in the materiality of risks*
- *Used to identify emerging risks and drive actions even if materiality is low today*

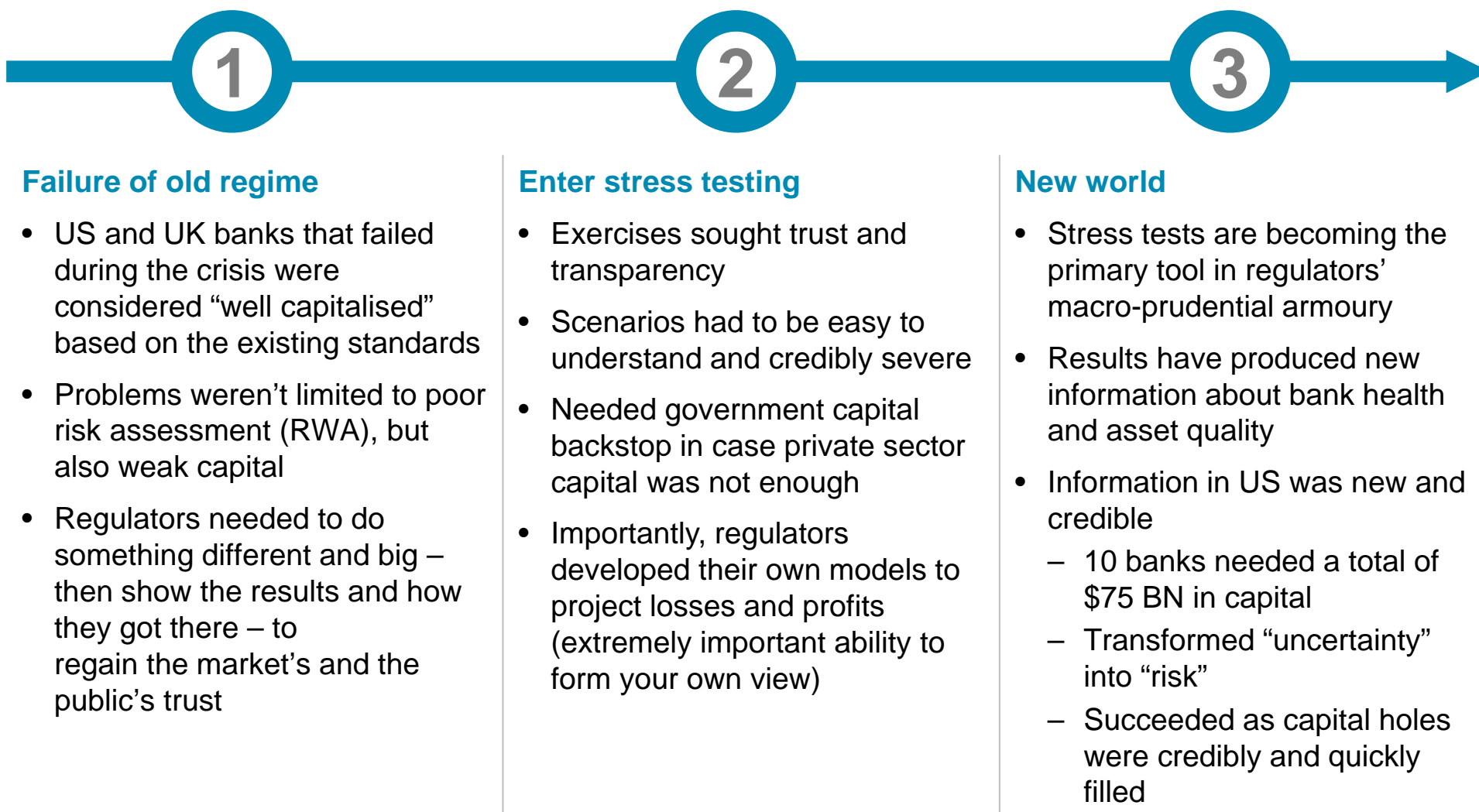
Assessment of materiality of risks may be based on quantitative analysis or qualitative judgment where quantification is challenging

E Output of risk identification can be categorized to develop a driver-based view of risk



4 | Evaluation of Risks

Macro-prudential stress testing started as a crisis response tool...



... and has evolved to a peacetime tool for bank oversight

Stress testing as a crisis response tool

- Stress test is deployed as a one-time response to a specific crisis (e.g. SCAP)
- Main purpose is to provide assurance to the markets by
 - Credibly (and conservatively) sizing the potential impact of a crisis
 - Providing evidence that a bank has sufficient capital to withstand crisis
- Given purpose, quantitative output of stress test is most important (i.e. does a bank have enough capital to withstand the stress)

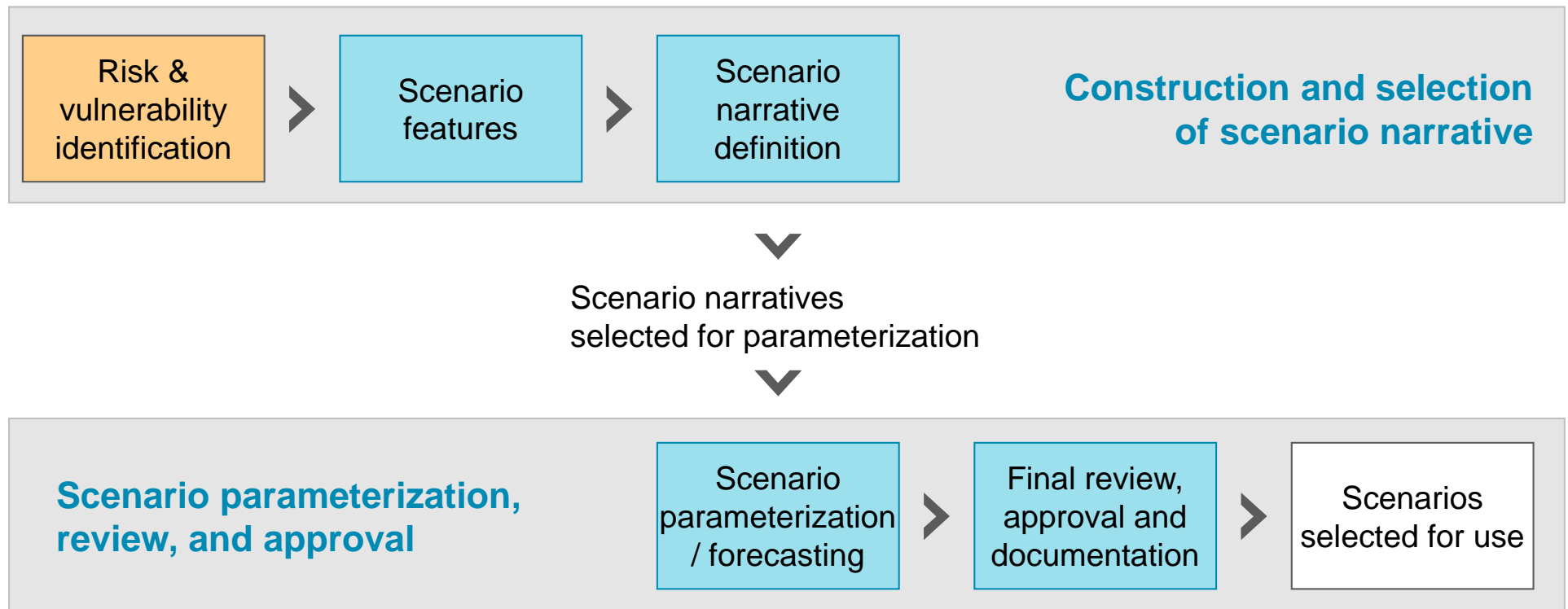


Stress testing as an ongoing risk management tool

- Regulatory stress test is a regular occurrence
- Purposes are varied, and broader than simply sizing potential impact of a crisis; they include
 - Assessment of capital adequacy (quantitative)
 - Assessment of an institution's risk identification, measurement, and management capabilities (qualitative)
- Given purposes, both the quantitative and qualitative dimensions are important to regulators
 - Increasingly, institutions “fail” CCAR for qualitative (e.g. risk management processes) as opposed to quantitative (e.g. insufficient capital) reasons

If wartime is about getting capital into banks, peacetime is about deciding whether to let it out

An effective scenario design process depends on having an appropriate risk identification process



US institutions incorporate tailored emerging and topical risks into their capital stress tests

Description of idiosyncratic risks in 2015 Stress Tests

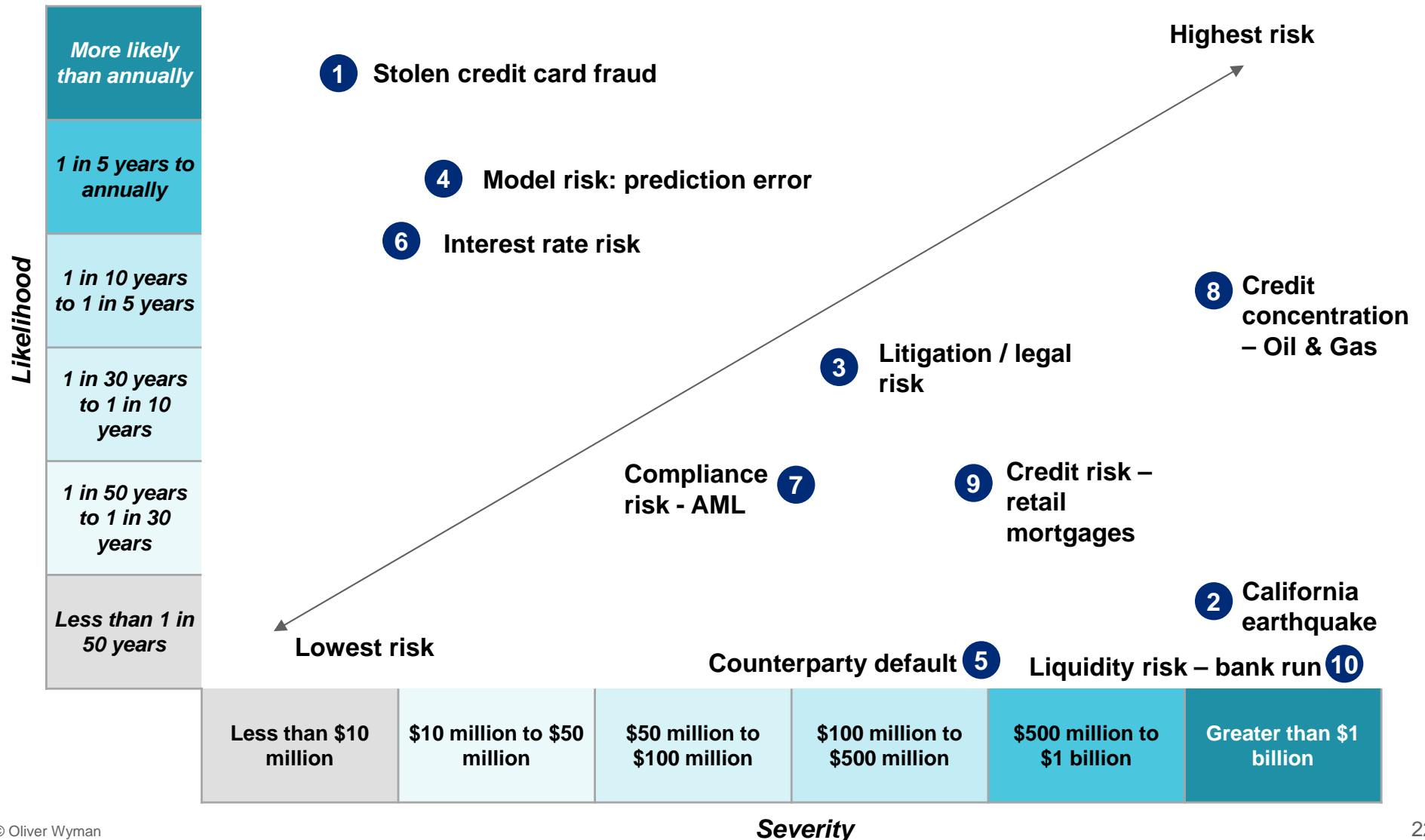
State Street	Bank-wide impacts from a severe cyber-attack on critical systems, a spike in deposits from the fixed income liquidity crisis , and losses associated with potential litigation from operational and reputational risks .
Morgan Stanley	Incremental attrition of financial advisors from the Company's Wealth Management business
PNC	Additional stresses to healthcare, oil and gas (and related CRE), education lending exposures and to borrowers that would be significantly impacted by a potential Federal government shutdown
US Bank	Induced drought conditions , primarily in the western states, and other agricultural stresses, such as the bird flu epidemic in the scenario; also included a hypothetical operational loss event related to Information / Cyber Security represented by a Retail Payment Solutions (RPS) credit card data breach
Comerica	A hyper-stressed energy scenario with the corresponding impact on the Texas market; a liquidity crisis event in which Comerica experiences a significant run-off of deposits and significant draws on unused loan commitments, as well as higher credit losses
Union Bank	Drought in California continues for two more years and stresses the agricultural loan portfolio as well as other drought-impacted sectors

Source: BHC-specific DFAST disclosures

Risk identification pushes management to compare and prioritize risks across the organization

Illustrative

Illustration of likelihood vs. impact matrix for assessment relative magnitude of risks

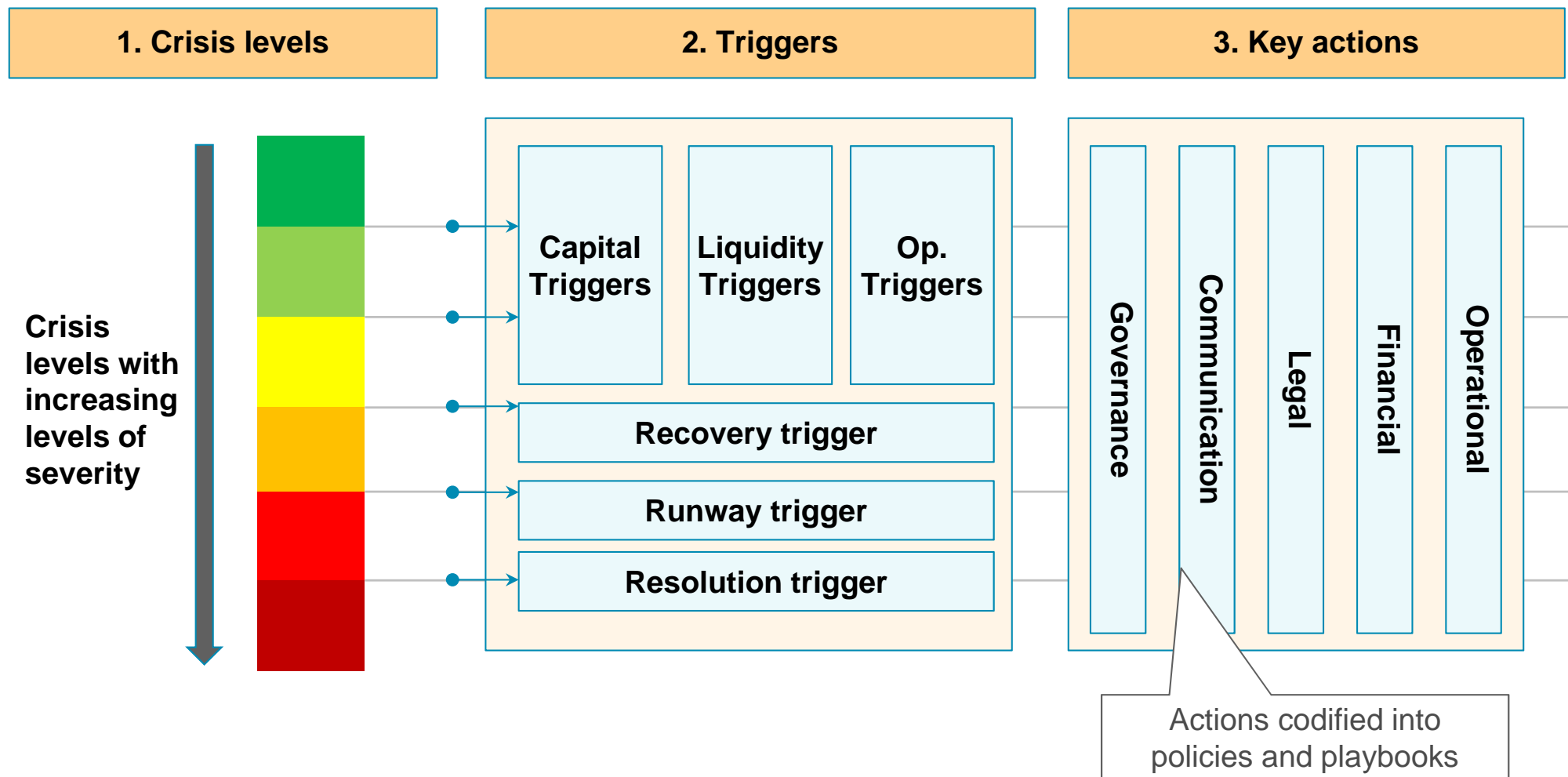


5 | Management and Mitigation of Risks

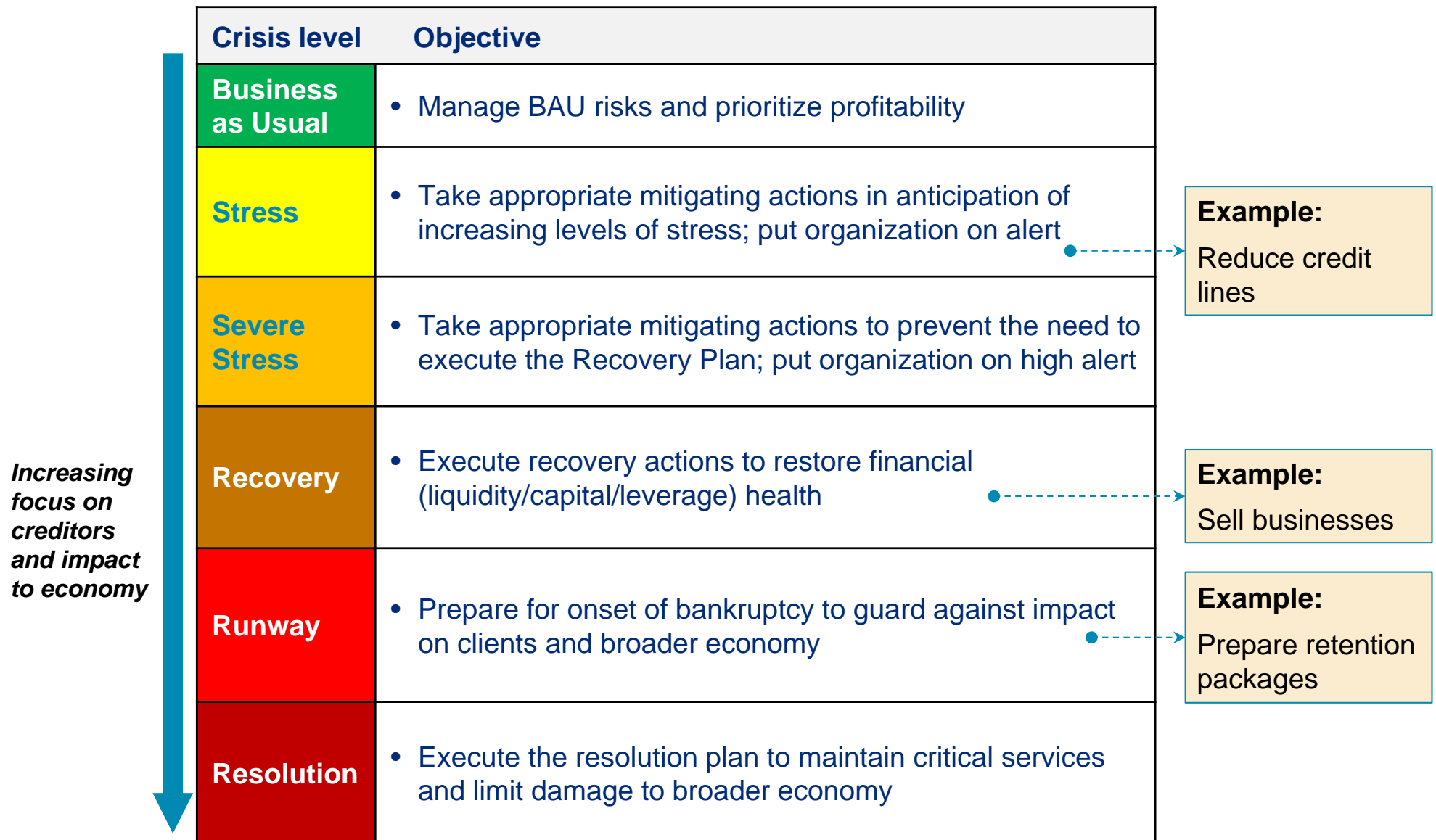
A suite of exercises is used to prepare for scenarios of increasing severity

	Stress scenario severity		
	Capital & Liquidity Stress Testing	Recovery Planning	Resolution Planning
Scenario	<ul style="list-style-type: none">Severe stress to going concern with minimal management intervention	<ul style="list-style-type: none">Extreme stress with significant and drastic management action taken to remain a going concern	<ul style="list-style-type: none">Catastrophic stress with insolvency determined to be unavoidable
Oliver Wyman Client Coverage	<ul style="list-style-type: none">31 of the 33 mandatory CCAR banks, including 8 of 8 G-SIFIs and 6 IHCs30+ banks in Europe130+ banks as part of quality assurance work for ECB	<ul style="list-style-type: none">5 G-SIFI & D-SIFIs in US and Europe	<ul style="list-style-type: none">10 of 14 institutions in the Fed's LISCC portfolio8 of 11 G-SIFI first wave filers10+ European financial institutionsDesigned Regulatory Guidance recently issued to Canadian D-SIBs

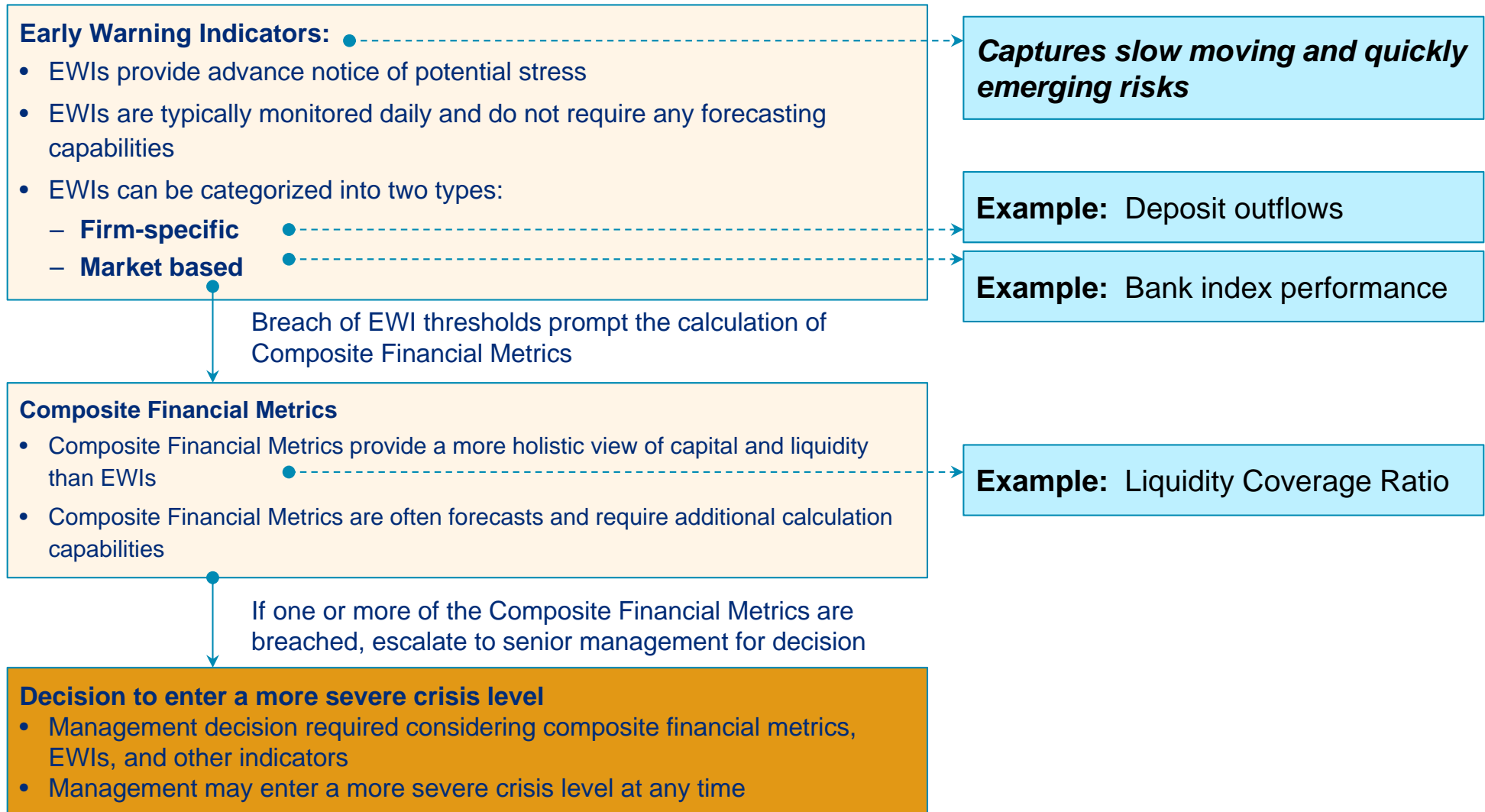
Institutions are developing internal management frameworks that drive action across levels of stress as risks materialize



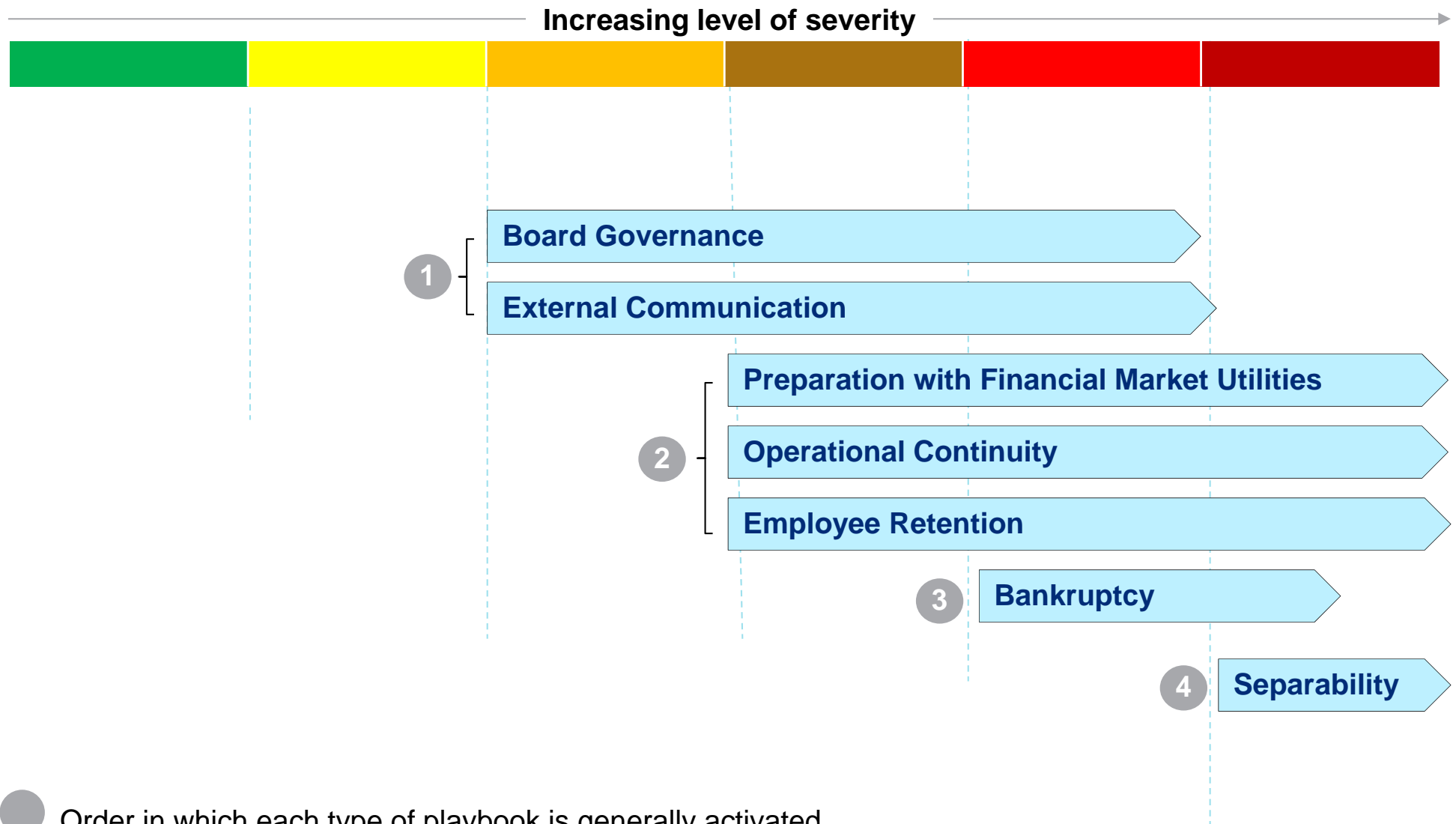
Management objectives differ over stages of crisis and drive various preparatory and mitigating actions



Early warning indicators and composite measures of financial health are used to trigger crisis as risks emerge and materialize



Specific 'playbooks' are linked to levels of stress to guide a quick and coordinated response as risks materialize



● Order in which each type of playbook is generally activated

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