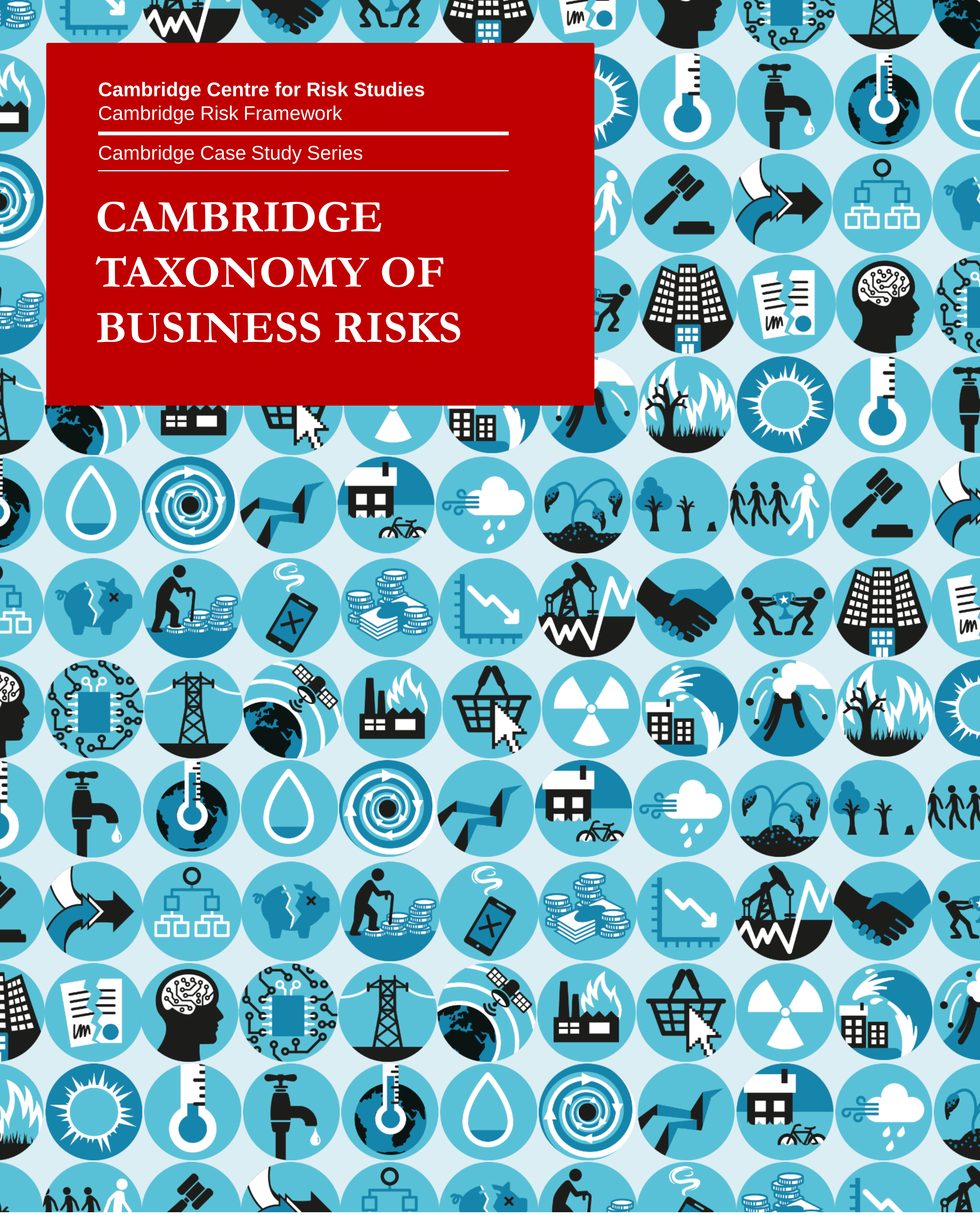

Cambridge Centre for Risk Studies
Cambridge Risk Framework

Cambridge Case Study Series

CAMBRIDGE TAXONOMY OF BUSINESS RISKS

Centre for
Risk Studies

UNIVERSITY OF CAMBRIDGE
Judge Business School

Acknowledgements

Cambridge Centre for Risk Studies gratefully acknowledges the supporters of the Centre for Risk Studies for their financial contribution to continue the research work represented in this report. We thank the many reviewers and contributors to the development of the Cambridge Taxonomy of Business Risk.

The Centre is grateful for the expertise provided by our research team, collaborators, and subject matter specialists. Any misinterpretation in use of the advice provided is entirely the responsibility of the Cambridge Centre for Risk Studies.

Paper Citation:

Cambridge Centre for Risk Studies, 2019. *Cambridge Taxonomy of Business Risks*.

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Cambridge Taxonomy of Business Risks

Contents

Cambridge Taxonomy of Business Risks

Executive Summary

Companies are increasingly taking a more rigorous approach to identifying the risks to their valuation and business performance. This is being driven by a confluence of stakeholder interests, regulatory pressures, and senior management concerns.

Risk registers published by companies show that businesses vary significantly in their perception of risks. Our surveys of executives' perception of business risk confirm those of many other benchmarking studies, that risk registers are not consistent, even in businesses in the same sector of commercial operation, where the risks could be expected to be similar from one company to another.

The Cambridge Centre for Risks Studies at Judge Business School at University of Cambridge has developed a taxonomy of business risks that spans the range of threats that could potentially impact a business.

We derive this from several areas of study:

- reviews of the self-declared risk registers made public by companies in their regulatory filings (Cambridge Risk Register Resource);
- observations of actual examples of causes of corporate distress (Cambridge Corporate Distress Catalogue).
- extensive literature review and analysis of causes of economic and social disruption throughout a long period of history;
- review of previous threat taxonomies developed by academia and industry.

Risks have been categorized by cause, and are grouped and structured using 'causal similarity', organized by a hierarchy of Class : Family : Type using clustering principles of similarity and commonality. Many risk types could of course belong in several different families, and arguments could be made for individual risks to be allocated to different classes, but to avoid repetition we have assigned each risk type only once.

We have identified 6 primary classes and 37 families of risks. Each family is subdivided into risk types, with between 2 and 11 risk types in each family and a total of 175 risk types in the taxonomy. Types could be further categorized into sub-types in the future if required.

We also compare the classes of risks that are included in self-declared risk registers with the classes of risks that are identified as causes of corporate distress in our resource catalogues. From these we conclude that Governance risks are underestimated in risk registers, and Geopolitical risks and possibly Financial, maybe being overestimated.

The Cambridge Taxonomy of Business Risks provides a comprehensive checklist of the full range of risks that could potentially pose a strategic threat to a company's business plans. We offer this as a framework for testing and prioritizing which risks are of importance to an individual company, as part of a systematic approach to risk evaluation.

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Cambridge Taxonomy of Business Risks

CTBR v2.0
04/11/2019

Financial

Economic Outlook
- Recession
- Stagnation
- Contraction
- Credit Crisis
- Steady Growth
- Expansion
- Acceleration
- Peak

Economic Variables
- Commodity Price Fluctuation
- Inflation
- Interest Rates

Market Crisis
- Asset Bubble
- Bank Run
- Sovereign Debt Crisis
- Flash Crash
- Fraudulent Market Manipulation
- Cryptocurrency Failure
- Reserve Currency Shift

Trading Environment
- Tariff Dispute
- Cartel Manipulates Market
- Organised Crime

Company Outlook
- Hostile Takeover
- Credit Rating Downgrade
- Investor Negative Outlook

Competition
- Disruptive Competitor
- Aggressive Competitor
- Fraudulent Competitor
- Intellectual Property Theft

Counterparty
- Supplier Failure
- Customer Failure
- Government Failure
- Creditor Failure
- Counterparty Fraud

Geopolitical

Business Environment (Country Risk)
- Talent Availability
- Industrial Action
- Minimum Wage Hike
- Sanctions
- Territorial Disputes
- Logistics Restrictions

Corruption & Crime
- Corruption Deterioration
- Crime Wave/Piracy Increase
- Slavery Practices

Government Business Policy
- Emerging Regulation
- Corporation Tax Rate Hike
- Diverted Profits Tax
- Nationalisation
- Confiscation of Assets
- Privatisation
- License Revocation

Change in Government
- Nationalism/ Protectionism
- Left-Wing Radicalism
- Right-Wing Radicalism
- Populism
- Environmentalism

Political Violence
- Social Unrest
- Terrorism
- Subnational Conflict & Civil War
- Coup d'État

Interstate Conflict
- Conventional Military War
- Asymmetric War
- Nuclear War
- Cold War

Technology

Disruptive Technology
- E-Commerce
- Gig Economy
- Artificial Intelligence
- 5G Technology
- Blockchain
- Robotics & Automation
- Augmented/Virtual Reality
- Cryptocurrency
- Autonomous Vehicles
- Drones
- Medical Advances

Cyber
- Data Exfiltration
- Contagious Malware
- Cloud Outage
- Financial Theft
- Distributed Denial of Service
- Internet of Things
- Industrial Control Systems
- Internet Failure

Critical Infrastructure
- Power
- Transport
- Telecommunications
- Satellite Systems
- Water & Waste
- Fuel
- Gas

Industrial Accident
- Fire
- Explosion
- Pollution
- Structural Failure
- Nuclear

Environmental

Extreme Weather
- Flood
- Tropical Windstorm
- Temperate Windstorm
- Drought
- Freeze
- Heatwave
- Wildfire

Geophysical
- Earthquake
- Volcanic Eruption
- Tsunami

Space
- Solar Storm
- Astronomical Impact Event

Climate Change
- Physical
- Liability
- Transition
- Increase in Extreme Weather
- Sea Level Rise
- Ocean Acidification
- Lower Carbon Economy

Environmental Degradation
- Waste & Pollution
- Biodiversity Loss
- Ecosystem Collapse
- Deforestation
- Soil Degradation

Natural Resource Deficiency
- Fossil Fuels
- Biogeochemicals
- Raw Materials
- Water

Food Security
- Animal Epidemic
- Plant Epidemic
- Famine

Social

Socioeconomic Trends
- Ageing Population
- Gender Imbalance
- Wealth Inequality
- Poor Educational Standards
- Migration

Human Capital
- Failure To Attract Talent
- Gender & Diversity
- Labour Disputes & Strikes
- Loss of Key Personnel
- Employee Misconduct

Brand Perception
- Fake News
- Negative Media Coverage
- Key Influencer Disruption
- Negative Customer Experience

Sustainable Living
- Consumer Activism
- Sustainable Purchasing
- Supply Chain Provenance
- Diet

Health Trends
- Obesity
- Longevity
- Antimicrobial Resistance
- Medical Breakthroughs
- Healthcare
- Social Care

Infectious Disease
- Influenza Pandemics
- Coronavirus-like Epidemics
- Viral Hemorrhagic Fevers
- Preventable Disease Outbreaks
- Unknown Emergent Diseases

Governance

Non-Compliance
- Emerging Regulation
- Internal Corruption & Fraud
- Negligence
- Revised Accounting Standards
- Occupational Health & Safety

Litigation
- Private Lawsuit
- Mass Tort
- Class Action

Strategic Performance
- Divestitures
- Joint Ventures
- Mergers & Acquisitions
- Restructuring
- Poor Investment

Management Performance
- Executive Mismanagement
- Ineffective Board
- Management Execution Failure

Business Model Deficiencies
- Technology
- Customer Preference Change

Pension Management
- Contribution Management
- Fund Management

Products & Services
- Product Defect/Failure
- Innovation (R&D) Failure

1 Context and Objectives

Organisations are exploring different approaches to identifying, quantifying, and managing risks to their operations and balance sheet.

1.1 Companies and Their Risk Registers

Companies are increasingly focused on managing risks to their businesses. A number of reports and surveys suggest that modern international corporations may face more risk than those of a generation ago, driven by globalisation, interconnectivity of the economy, and a changing risk landscape. Regulatory pressures and shareholder scrutiny require businesses to be more explicit about the risks that they face. Many businesses maintain their own "risk registers" of strategic threats to their business plan. These are mainly for internal purposes to aid in prudent management. They also publish sanitized versions of their risk registers to help investors in their business, and other stakeholders, understand the threats that could be posed to their business success.

Publicly-listed corporations remain accountable to shareholders through their quarterly and annual reports. These reports are a corporate's main communication channel to investors and regulators, while potentially providing a backstop for securities class action litigation contending that a corporate has not disclosed a risk.

Risk Reporting for US Securities and Exchange Commission

Since 1964, the SEC has required all public companies in USA to disclose "the most significant factors that make the company speculative or risky".[1] In 2005, the SEC introduced the concept of risk factors. In the "Risk Factors" section 1A of the 10-K or 20-F, corporates should provide "a discussion of the most significant factors that make the offering speculative or risky".[2]

The risk factors should include the following:

1. Your lack of an operating history;
2. Your lack of profitable operations in recent periods;
3. Your financial position;
4. Your business or proposed business; or
5. The lack of a market for your common equity securities or securities convertible into or exercisable for common equity securities."[3]

In August 2019, the SEC voted to proposed improvements to disclosure reporting to aid investors. The changes include adding a summary page if the risk factors section is over 15 pages long affecting an estimated 40% of fillers, a requirement to organise risk factors under relevant headings and a change in termonology from disclosing risk factors to will have the "most significant" impact to factors with a "material" impact.[4] "Most significant" being defined as your principal risks and "material" to risks where there is "substaintial likelihood that a resonable investor would attach importance in determining whether to purchase the security."[5]

Further, the SEC has released "interpretive guidance" to help corporates better report their exposures to climate change and cyber security risks.[6]

[1] (SEC.gov 2019; Barychev 2016; SEC.gov 2018b)
[2] (Legal Information Institute 2018)
[3] (Legal Information Institute 2018)
[4] (SEC.gov 2019)
[5] (Securities and Exchange Commission 2019)
[6] (Gelles 2016; Kahn 2017; SEC.gov 2018a; Veltsos 2018)

Companies based in the US must file with the Securities and Exchange Commission (SEC) a 10-K while those those based abroad but listed in the US are considered a "foreign private issuer" and must complete a 20-F. In UK, the Financial Regulatory Council (FRC) Corporate Governance Code 2019 requires businesses UK based corporates to complete a robust assessment of both their principal and emerging risks.

Risk Reporting for UK Financial Regulatory Council

The UK FRC Corporate Governance Code was developed following a string of corporate financial reporting scandals leading to the publication of the Cadbury Report in 1992.[8] The Code has evolved over the years new requirements on director's remunieration and long-term viablity statements. The last update to the Code, effective January 2019 requires businesses to also consider emerging risks along side principal risks.

UK corporates list on the London Stock Exchange are required to complete "a robust assessment of the company's emerging and principal risks, and to confirm in its annual report the procedures in place to identify emerging risks, and an explanation of how these are being managed and mitigated".[9] Further they ask that "companies should consider the potential impact and probability of the related events".[10]

The Code defines "principal risks [as those that] threaten the company's business model, future performance, solvency or liquidity and reputation". [11] However, the FRC does not provide a definition of emerging risks. This is left to the interpretation of the individual organisation.

A law passed in France in March 2017, stated that large companies must establish and publish a "duty of care plan" to identify and prevent environmental, human rights, health and safety and corruption risks regarding not only their own activities, but also those of their subsidiaries, subcontractors and suppliers with which a long term commercial relationship exists, in France and abroad. Law explicitly requires "a risk mapping aimed at identifying, analysing and classifying such risks".[12]

Following the Great Recession, regulators internationally have increased the reporting requirements for the financial services sector. In the US and Europe, banks are now required to complete annual stress tests based on the International Regulatory Framework for Banks (Basel III) and the US Dodd-Frank Act of 2010. Regulation of the insurance sector followed in the UK via the Bank of England Prudential Regulatory Authorities.

1.2 Risk Terminology

Having a concise definition for both principcal and emerging risks is key to clear communication. The UK FRC provide a useful definition for principal risks and is provided below. Neither the UK FRC or US SEC provide a definition of emerging risks. We have searched through a wide variety of published definitions to propose the emerging risks definitions provided here.

The following are definitions we recommended for key risk related terms:

Principal Risk – risks that "threaten the company's business model, future performance, solvency or liquidity and reputation". [19]

Emerging Risk - a new risk, changing risk, or novel combination of risks for which the broad impacts, likelihoods and costs are not yet well understood.[20]

[8] (Swabey 2017)
[9] (Financial Reporting Council (FRC) 2018)
[10] (Financial Reporting Council (FRC) 2018)
[11] (Financial Reporting Council (FRC) 2018)
[12] (Norton Rose Fulbright 2017)
[19] (Financial Reporting Council (FRC) 2018)
[20] This version is adapted following feedback from the definition we originally proposed in the following blog (Copic 2019)

Strategic Risk - risks with the potentially to significantly alter the long term valuation or vailability of an organization. Principal and emerging risks can also be considered strategic risks as they are long versus short term in nature.

A Definition of Emerging Risk[21]

The UK FRC requires a company to report on its emerging risks and yet does not provide a definition of what it means by an emerging risk. The US SEC does the same.

To provide a definition, we researched how people have defined emerging risks elsewhere. The International Organization for Standardization (ISO) is developing a new standard, ISO/NP 31050, for managing emerging risks but this is still in the early stage of being drafted with a final publication years away. CCRS has contributed to the ISO discussion of a definition of emerging risks, but a definition has yet to be agreed. The International Risk Governance Council (IRGC) has a definition that is a bit more useful. An emerging risk, it states, is “a new risk, or a familiar risk in a new or unfamiliar context (re-emerging). These risks may also be rapidly changing (in nature)… their probabilities and consequences are not widely understood or appreciated.”[22] The IRGC also adds to their lengthy definitions that emerging risks are likely to “have no convincing plan of action for mitigation”.[23] The latest COSO framework does not provide a definition.

We then reviewed definitions proposed by professional advisory service providers who suggest that emerging risks “may not be fully understood”[24], are “newly developing or changing risks which are difficult to quantify and which may have a major impact on an organization”[25], could “derail the company’s plan”[26], are seen as “long-term trends”[27], “beyond any particular party’s capacity to control … [and are]… large impact, hard-to-predict, and rare events beyond the realm of normal expectations”[28].

Finally, we then turned to academia studies of emerging risks a found a range of views. Mazri (2017) proposed that there are four different states of emerging risks: hidden risks, scientific controversies, societal engagement and fully emerged risks.[29] While Aven and Krohn (2014) explore the relationship between probability, knowledge and consequences in determining emerging risks.[30] Finally Flage and Aven (2015) propose four different risk definitions: newly created risk, newly indentified/noticed risk, increasing risk and risk becoming widely known or established.[31]

These definitions draw attention to a set of variable criteria by which a company can judge their relationship to risk – things that can derail plans, or just are difficult to quantify, or things that are too big to control.

We offer the definition that CCRS is using to help our research partners in developing their robust assessments of emerging risk in the wake of the FRC’s new code:

An emerging risk is a new risk, changing risk, or novel combination of risks for which the broad impacts, likelihoods and costs are not yet well understood.[32]

Conventional definitions of business risks need be clarified. Many risk registers seen in annual reports are combinations of causes and effects, or high level categories of a wide range of risks, or cryptic legal statements. Declaring that a company has a strategic risk of ‘Potential Loss of Revenues’ may not be a helpful guide to potential investors or stakeholders in the business. For example, economic risk can be a mixture of distinct corporate threats such as sovereign default and policy change, resulting in consequences such as credit downgrades, as well as macroeconomic factors like inflation and unemployment. A commonly cited risk is reputational damage, and another is cyber attacks. But a cyber attack causing a data breach could cause reputational damage. Thus, company reputation

[21] Adapted from (Copic 2019)
[22] (IRGC 2019)
[23] (IRGC 2019)
[24] Lloyd’s definition found in (Flage and Aven 2015)
[25] Swiss Re definition found in (Flage and Aven 2015)
[26] (EY 2018)
[27] (AXA 2019)
[28] PwC definition found in (Flage and Aven 2015)
[29] (Mazri 2017)
[30] (Aven and Krohn 2014)
[31] (Flage and Aven 2015)
[32] This version is adapted following feedback from the definition we originally proposed in the following blog (Copic 2019)

should be captured as a consequence that is a possible outcome of any threat. Borderlines should be drawn among these abstractions without the loss of their dynamic interrelationships, the output of which is a numerical shock to company financials.

1.3 Towards a Comprehensive Risk Register

To manage risks appropriately a business needs a comprehensive register of its risks. Most businesses create an ad-hoc listing of the risks that they are most familiar with, and of course, executives who are managing their organization are best placed to evaluate the risks to their operations.

However it is clear from comparisons of different companies' publicly declared risk registers that businesses vary significantly in their perception of risks. Our own surveys of executives' perception of business risk confirm those of many other benchmarking studies, that risk registers are not consistent, even in businesses in the same sector of commercial operation, where the risks could be expected to be similar from one company to another.

Businesses would benefit from a comprehensive checklist of the full range of risks that could potentially pose a strategic threat to their business plans. This could form a framework for testing and prioritizing which risks are of importance to that individual company, as part of a systematic approach to risk evaluation.

The approach of the Cambridge Centre for Risks Studies is to develop a taxonomy of business risks that can span the range of threats that could potentially impact a business. We derive this from several areas of study:

- reviews of the self-declared risk registers made public by companies in their regulatory filings;
- observations of actual examples of causes of corporate stress;
- extensive literature review and analysis of causes of economic and social disruption throughout a long period of history;
- review of exisiting taxonomies both from academia and industry.

2 Methodology

2.1 Self-Reported Risk Registers

An important source for review of business risks to contribute to a comprehensive taxonomy of risks are self-reported risks in published regulatory accounts, and perceptions of risk by senior managers. We report top risks identified in Cambridge's 2018 Enterprise Risk Management Survey by business sector.[33] The top four enterprise risks are displayed by each Global Industry Classification Standard (GICS) sector in the sector view, see **Figure 1**. Revenues, Operational Performance, Regulatory Standards and Reputation are recognised as top risks for all sectors.

Several academic and commercial firms have completed reviews of annual risk reporting, looking at how informative the Risk Factors are for investors. A 2016 review of annual reports found that the Risk Factors section of US SEC 10-K reports account for 7% of the length of the report with a range of 1 to 30%. The Technology, Telecommunications, and Utilities sectors dedicated the highest page count to Risk Factors.[34, 35] Further, the study found the average number of risk factors reported to be 22. 70% of companies reported generic risks (such as corporate finance and operations, capital markets and economic conditions and government and regulation) and only 30% reported less common risks (such as key personnel, company reputation and governance matters).[36]

[33] (Cambridge Centre for Risk Studies and Institute of Risk Management 2018)
[34] Review used baselined data from Jan 2015. The study normalised all reported risks to 17 different categories and binned the risk section of 50 companies (5 largest in 10 sectors) into those bins.
[35] (Ernst & Young and IRRC Institute 2016a)
[36] (Ernst & Young and IRRC Institute 2016a)

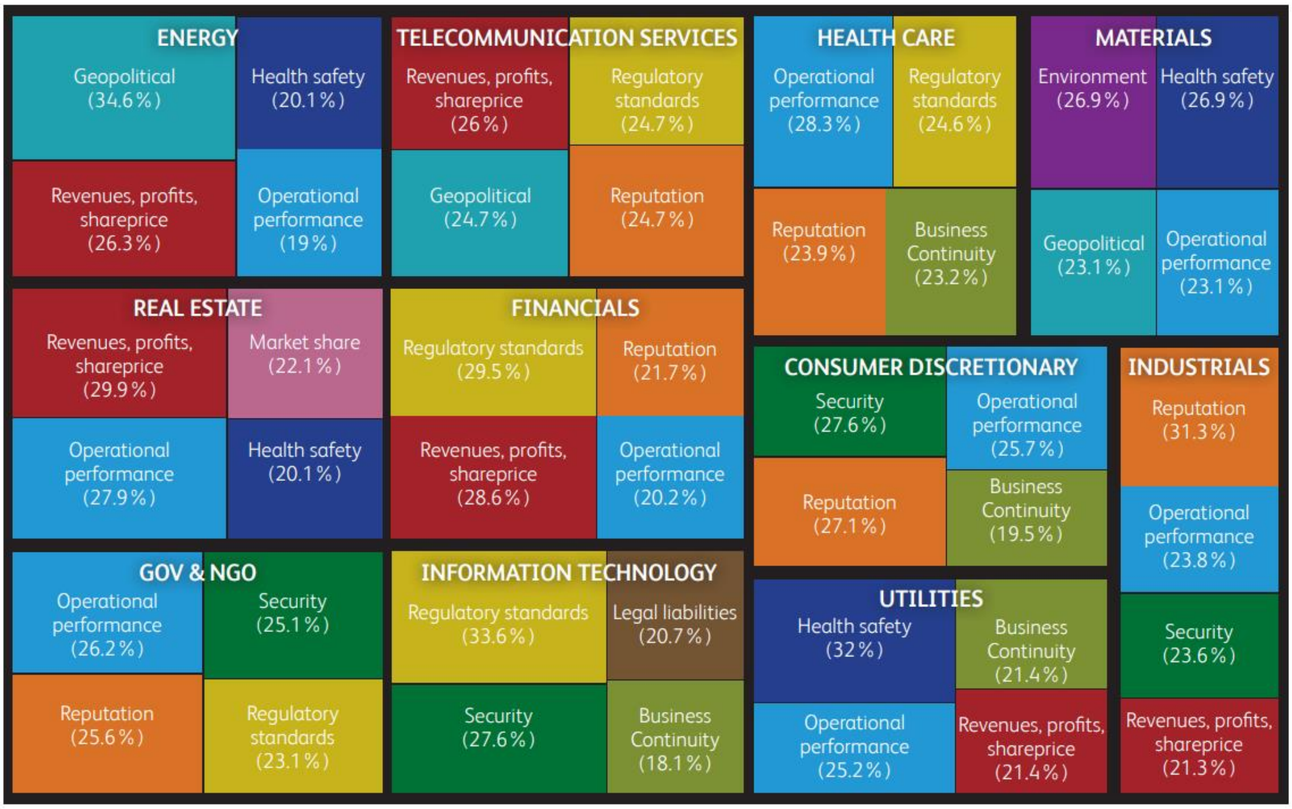


Figure 1: Top Enterprise Risks for Companies by GICS Sectors (Source: Cambridge Centre for Risk Studies 2018 ERM Survey[37]).

There is a lack of common language for risk disclosures, and several cases of language being vague and opaque. One study suggests that in order for the Risk Factors to be informative for investors and other users of financial statements, they need to be more specific.[41] Other studies support the mandatory reporting requirement by the US SEC,[42] advocate ranking Risk Factors to be more informative,[43] urge firms with greater cash flow risk to disclose more information,[44] and claim that risk disclosures were more informative prior to the 2008 financial crisis.[45]

To assist with the development of a comprehensive taxonomy of business risks, the Centre of Risk Studies has compiled an extensive selection of publicly disclosed business risk registers: the Cambridge Risk Register Resource. In this we reviewed company disclosures (10-Ks, 20-Fs, annual reports and risk management reports for Latin American companies) for 60 of the Forbes 100 largest public companies, based mainly in North America, Asia Pacific, Europe and Latin American.[46] In total, over a thousand risk factors have been identified and categorised into 20 risk categories from the 2018 ERM Survey, see **Figure 2**.

[37] (Cambridge Centre for Risk Studies and Institute of Risk Management 2018)
[41] (Hope, Hu, and Lu 2016)
[42] (J. L. Campbell et al. 2014)
[43] (Chin, Liu, and Moffitt 2018)
[44] (Heinle and Smith 2017)
[45] (Beatty, Cheng, and Zhang 2018)
[46] (Forbes 2018)

	Communication Services	Consumer Discretionary	Consumer Staples	Energy	Financials	Health Care	Industrials	Information Technology	Materials	Utilities	Grand Total
Financials - Revenues, profits, share price	7	18	11	29	84	10	10	5	8	5	187
Regulatory, standards and reporting	9	9	17	43	63	12	12	8	10	2	185
Macro-economic and trade factors	10	12	21	25	72	5	11	1	22	1	180
Market share	11	7	19	15	25	18	9	6	8	1	119
Other	8	5	14	2	17	8	5	10	6	1	76
Legal liabilities including taxation	10	7	8	4	17	3	5	7	2		63
Security of enterprise including cyber security	3	3	10	8	15	3	3	3	3	1	52
Natural catastrophe and climate		3	5	20	11	2	1		5		47
Reputation/brand	3	3	8	2	12	2		3		1	34
Human capital	4	2	6	3	6		1	2	6	2	32
Environment and sustainability		3	4	13	1				5	1	27
Operational performance	3		3	2	7			8	4		27
Financials - Debt, pensions, and obligations	2	3			8		8	1	3		25
Business continuity and crisis management		1	3	4	1		2		1		12
Health and safety	1		6	1					2		10
Credit rating	1	1	1		2		1				6
Devaluation or damage of physical assets	1							1		1	3
Geo-political risks			1		1			1			3
Company viability											0
Gender and diversity											0
Grand Total	73	77	137	171	342	63	68	56	85	16	1088
Count of Companies Reviewed	4	4	7	11	19	3	4	2	5	1	60

	Communication Services	Consumer Discretionary	Consumer Staples	Energy	Financials	Health Care	Industrials	Information Technology	Materials	Utilities	Grand Total
Financial	30	37	45	64	189	28	39	15	43	7	497
Geopolitical	8	8	23	43	64	11	9	11	10	2	189
Governance	19	14	21	11	38	15	9	18	10	1	156
Social	10	7	27	8	19	3	5	7	8	3	97
Environmental	1	6	9	33	13	2	1	1	10	2	78
Technology	5	5	12	12	19	4	5	4	4	1	71
Grand Total	73	77	137	171	342	63	68	56	85	16	1088
Count of Companies Reviewed	4	4	7	11	19	3	4	2	5	1	60

Figure 2: Heatmap of Risk Factor Occurrence by Risk Category across GIC Sectors (Source: Cambridge Centre for Risk Studies).

Overall, the top risk categories of concern are revenues, profits, share price, regulatory, standards and reporting and macroeconomic and trade factors. Other findings are that the US 10-K/20-F format is harder to parse than the UK/European version, some non-Western-centric companies report very few risks, and typically only banks include a risk appetite section.

The different vocabulary of risk factors present in annual reports highlights the need for a consistent risk taxonomy. The interchange of primary threats and consequences from threats as risk factors further emphasizes this point. With the trend in risk reporting potentially migrating towards scenario based probabilistic assessment it will be interesting to watch how companies transform their risk exposure communications.

2.2 Observations of Corporate Distress

Corporate distress and default is the severe consequence of risks that have affected a business and which have not been manageable. Cases studies of distress provide important lessons for businesses to learn from past examples, to identify the causes, and to incorporate relevant threats from these in their risk registers.

The Centre for Risk Studies has compiled the Cambridge Corporate Distress Catalogue which incorporates precedent distress and default case studies of large, influential and diversified corporations. In doing this, we aim to facilitate a better understanding of why companies fail, due to causes spanning different geographical regions and business sectors.

2.2.1 Corporate Distress Definitions

Distress is mostly defined in financial terms because it synthesises various causes of failure and is consequently reflected in financial statements. Definitions are not uniform, however, and distress behaviour manifests in different forms. Quantitatively, distress can happen when a firm's liquidation value is less than the total value of creditor claims.[47] Distance-to-default is another probabilistic indicator, measuring how close a firm is to bankruptcy.[48] Descriptively, distress is associated with lost market value, inefficient production, high financial leverage, cash flow problems and high sensitivity to economic conditions.[49] It is arguably inseparable from the concept of a turnaround strategy, which is usually implemented after distress happens.[50] Researchers and practitioners should be aware of these definitions when studying corporate distress.

Distress can stem from a wealth of potential threats, either external or internal. Although exogenous impacts of macroeconomic uncertainty and market volatility are ever crucial to businesses, external, non-financial risks such as a geopolitical crisis or cyber attack are also growing concerns. The Brexit vote in 2016 and the WannaCry ransomware attack in 2017 are prominent examples that either pose considerable challenges to business viability or continuity, or caused significant disruption to businesses in the case of WannaCry. Events such as the 2018 wildfire season in California have also reminded the business world that natural catastrophes have the capacity to cause severe impacts ranging from value chain disruption to total destruction and corporate failure.[51] Compounded with these exogenous risks are threats internal to businesses, such as management inertia and ineffective operation. These perils are typically unveiled with hindsight when companies go distressed or bankrupt.

2.2.2 Corporate Distress Statistics

Between the mid-1990s and 2016, the number of US public companies has decreased by 55%, from more than 8,000 to 3,627.[52] This rapid reduction in numbers is largely the result of mergers and acquisitions (M&A) and delistings. During financial market turmoil, such as the dot-com bubble burst, around 2,800 companies in the US disappeared, equivalent to 74% of the total loss figure from 1996 to 2016.[53] Although the number of US-listed companies has stabilised at around 4,200 since the

[47] (Chen, Weston, and Altman 1995; Hotchkiss et al. 2008a)
[48] (Koh et al. 2015a)
[49] (J. Y. Campbell, Hilscher, and Szilagyi 2011a)
[50] (Schweizer and Nienhaus 2017)
[51] (Melnick, Pearl, and Cochrane 2018)
[52] (Sommer 2018)
[53] (Brorsen 2017)

Great Recession (2008), a considerable portion of this number is attributed to a steady increase in cross-border listings of foreign entities.[54] A watch on M&A shows that roughly 4,800 private companies were acquired in 2016 – a 146% surge from the mid-1990s record.[55] Targets are often companies with lower valuations or a slender growth outlook, which are more likely in distress or on the brink of default.

Another big shift can be found in the size of firms. In 1975, 61.5% of public firms had less than $100m of assets, while in 2015, this proportion had dropped to 22.6%.[56] The largest 21 firms listed in the US have a quarter of the total market capitalisation, and the top 200 account for all profits of public firms.[57] The augmenting skewness towards larger corporations reveals an increasingly harsh environment for small- and medium-sized businesses to emerge and survive.

Bankruptcy statistics suggest that corporate failure has increased globally. When trade tensions escalate, investors redeem their capital and bankruptcy filings can increase rapidly. Bankruptcies are also higher in countries such as Iceland and Denmark where there is more stringent creditor rights protection and higher judicial efficiency.[58] Explicit bankruptcy codes, existing deposit insurance together with favourable tax system encourage more borrowing, which may increase the risk of insolvency.[59] Many companies incorporate scenario analysis as part of their strategic analysis to provide insights into potential triggers of distress.

A study focussing on more recent evidence suggests that global bankruptcy trends vary regionally. In 2016, 26 in the sample of 38 countries experienced declining bankruptcy rates relative to the previous year, whereas 10 saw an increase.[60] Corporate failures showed a geographical cluster in Europe including Denmark, Czech Republic and UK.

2.2.3 Financial Distress Metrics

Clues of distress can be tracked in the financial metrics typically monitored by risk managers. Profitability, efficiency, liquidity, financial soundness, solvency, capital structure and valuation constitute the seven most commonly used categories of financial metrics. A typical bankruptcy case displays worsening profitability and plummeting valuation in consecutive years before the company reaches insolvency and defaults.

2.3 A Taxonomy of Threat for Complete Risk Management, 2014

This work builds on and extends work carried out by Cambridge Centre for Risk Studies in the publication of a taxonomy of threats to the global economy.[61]

The Centre for Risk Studies developed a taxonomy of macro-catastrophe threats using key definitions. Identifying threats involved an extensive historical review of causes of social and economic disruption over the past thousand years. This was augmented with a review of catastrophe catalogues and databases, a precedent review, a study of counter-factual theories, and a peer review process.

[54] (Brorsen 2017)
[55] (Brorsen 2017)
[56] (Sommer 2018)
[57] (Kahle and Stulz 2016)
[58] (Claessens and Klapper 2005)
[59] (Fan, Titman, and Twite 2012)
[60] (Dun & Bradstreet Worldwide Network 2017)
[61] (Cambridge Centre for Risk Studies 2014)

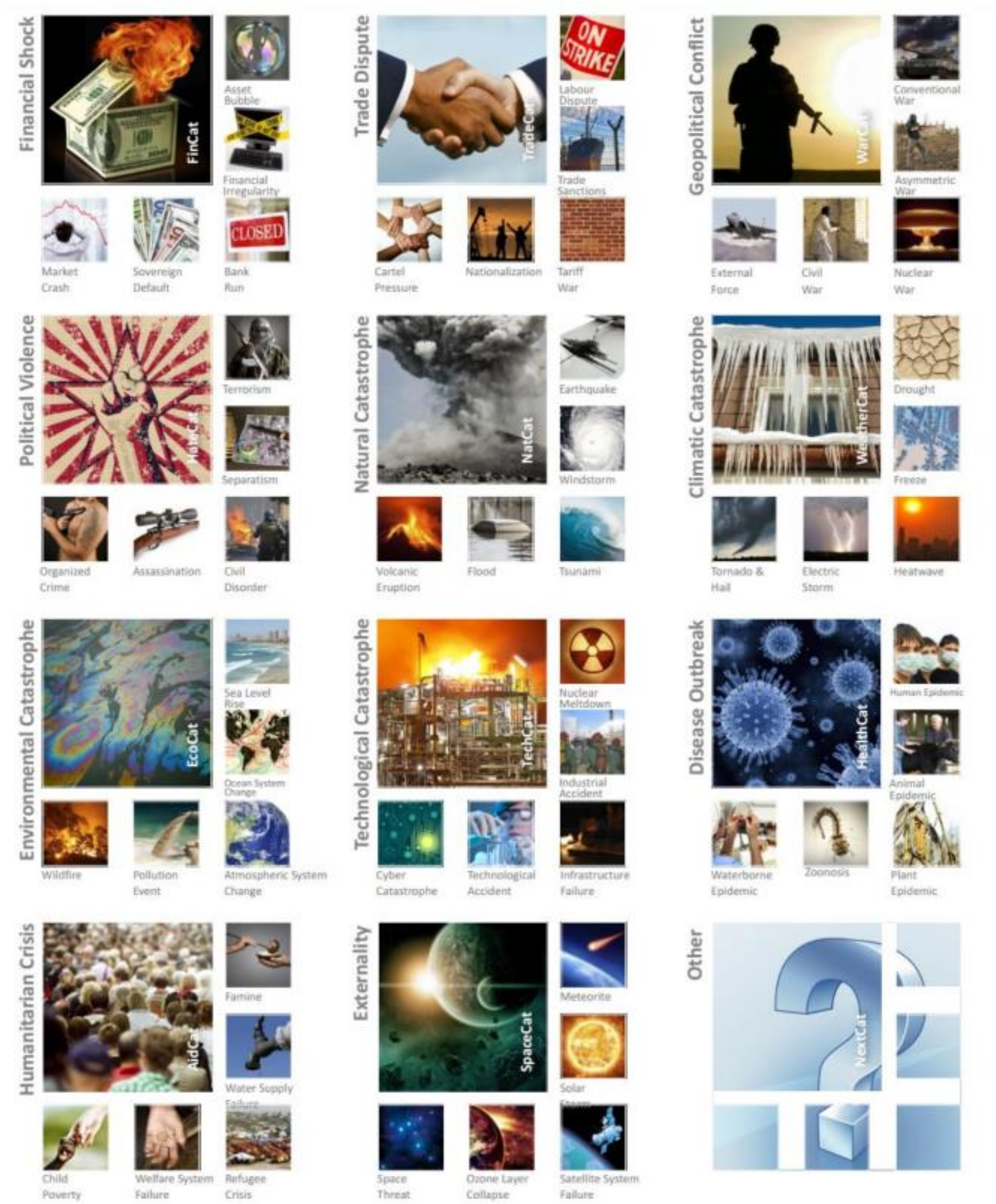


Figure 3: A Taxonomy of Threats for Complex Risk Management, 2014 (Source: Cambridge Centre for Risk Studies).[62]

[62] (Cambridge Centre for Risk Studies 2014)

Each type of risk exhibits different mechanisms of disruption to both society and the economy, exposes specific vulnerabilities and poses different challenges for improving resilience of systems in risk management. A taxonomy of different causal mechanisms is an important first step in categorizing threats.

2.3.1 Macroeconomic Catastrophes

There are very few incidences of an entirely new phenomenon. Macro-catastrophes reappear throughout history in various different manifestations, in different places, and with different characteristics, but from similar recurring underlying processes. The fact that they are 'unexpected' is more to do with human perception and short memories than to a unique new process occurring.

2.3.2 Methodology

The 2014 taxonomy of threats was developed through an extensive historical review. The first iteration of the project (threat taxonomy version 1.0) reviewed events of the 21st, 20th and second half of 19th century – a review period of around 160 years. The second iteration (to produce the current threat taxonomy version 2.0) extended this review back as far as 1000 AD. The research employed factual chronological catalogues of events of historical political, economic and social significance, documented by year. The economic criteria were difficult to establish for any early history events but in these cases an inclusive approach was taken and if the event appeared significantly disruptive it was included.

In addition to chronological histories, catalogues of past disruptive events, disasters, and catastrophes were reviewed.

2.4 Further Taxonomies Reviewed

A review of catalogues of risks found that cyber and climate change are the most commonly listed emerging risks. The inconnectedness of risk is highlighted in the World Economic Forum Global Risk Report for the first time in 2019, with the top interconnected risks being:

- "Extreme weather events + failure of climate-change mitigation and adapation,
- Large-scale cyberattacks + breakdown of critical information infrastructure networks,
- High structural unemployment or underemployment + adverse consequences of technological advances."[63]

Further, academic and industry studies list the following as key emerging risks:[64]

- Environmental related
  - Food security
  - Biodiversity loss
  - Ecosystem collapse
  - Natural resource management, specifically water
- Technology related
  - Ethical consideration regarding the use of technology
  - Artifical intelligence and big data
- Social and human health related
  - Long term exposure to harmful substances such as synthetic biology or nanomaterials
  - Failure of urban planning
  - Medical innovations
  - Underestimated infectious diseases

[63] (World Economic Forum 2019)
[64] (Flage and Aven 2015; Weymann and Egloff 2017; AXA 2019)

We also reviewed various classifications of risks summarised in Table 1, with the first one being a manual classification while the other two are generated from automated textual analysis. The general challenge with these categorisations is that they are a mixture of threats and consequences. For example, reputation damage could be a consequence of a cyber attack, a failed merger and acquistion or even litigation.

Table 1: Risk categorisations in literature, no mapping, non-ordered.

Risk	EY (2016) [65]	Bao & Datta (2012) [66]	Huang & Li (2011) [67]
#1	Capital markets and economic conditions	Investment, property, distribution, interest, agreement	Financial condition risks
#2	Company reputation	Regulation, change, law, financial, operation, tax, accounting	Restructuring risks
#3	Competitive landscape	Gas, price, oil, natural, operation, production	Funding risks
#4	Consumer power	Stock, price, share, market, future, dividend, security, stakeholder	Merger & Acquisition risks
#5	Corporate finance and operations	Cost, regulation, environmental, law, operation, liability	Regulation changes
#6	Corporate growth strategies	Control, financial, internal, loss, reporting, history	Catastrophes
#7	Cyber, physical assets and data security	Financial, litigation, operation, condition, action, legal, liability, regulatory, claim, lawsuit	Shareholder's interest risks
#8	Energy and natural resources	Competitive, industry, competition, highly, market	Macroeconomic risks
#9	Governance matters	Cost, operation, labour, operating, employee, increase, acquisition	International risks
#10	Government and regulation	Product, candidate, development, approval, clinical, regulatory	Intellectual property risks
#11	Human capital	Tax, income, asset, net, goodwill, loss, distribution, impairment intangible	Potential defects in products
#12	Innovation and competitiveness	Interest, director, officer, trust, combination, share, conflict	Potential/Ongoing Lawsuits
#13	Key personnel	Product, liability, claim, market, insurance, sale, revenue	Infrastructure risks
#14	Litigation and legal liabilities	Loan, real, estate, investment, property, market, loss, portfolio	Disruption of operations
#15	Natural and human disruptions	Personnel, key, retain, attract, management, employee	Human resource risks
#16	Power and communications infrastructure	Stock, price, operating, stockholder, fluctuate, interest, volatile	Licensing related risks
#17	Supply chain and third party	Acquisition, growth, future, operation, additional, capital, strategy	Suppliers risks
#18		Condition, economic, financial, market, industry, change, affected, downturn, demand	Input prices risks
#19		System, service, information, failure, product, operation, software, network, breach, interruption	Rely on few large customers
#20		Cost, contract, operation, plan, increase, pension, delay	Competition risks
#21		Customer, product, revenue, sale, supplier, relationship, key, portion, contract, manufacturing, rely	Industry is cyclical
#22		Property, intellectual, protect, proprietary, technology, patent, protection, harm, license	Volatile demand and results
#23		Product, market, service, change, sale, demand, successfully, technology, competition	Volatile stock price risks
#24		Provision, law, control, change, stock, prevent, stockholder, Delaware, charter, delay, bylaw	New product introduction risks
#25		Regulation, government, change, revenue, contract, law, service	Downstream risks
#26		Capital, credit, financial, market, cost, operation, rating, access, liquidity, downgrade	
#27		Debt, indebtedness, cash, obligation, financial, credit, covenant	
#28		Operation, international, foreign, currency, rate, fluctuation	
#29		Loss, insurance, financial, loan, reserve, operation, cover	
#30		Operation, natural, facility, disaster, event, terrorist, weather	

Automated textual analysis still contains overlapping concepts. Corporations benefit from a third-person perspective of assessing corporate threats, consequences, attributes, business environments, impacts and mitigations on an aggregate level.

[65] (Ernst & Young and IRRC Institute 2016b)
[66] (Bao and Datta 2012)
[67] (Huang and Li 2008)

3 Cambridge Taxonomy of Business Risks, 2019

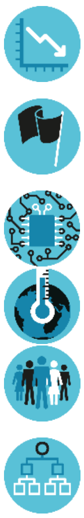
The analysis of publicly disclosed business risk registers in the Cambridge Risk Register Resource, the review of causes of corporate distress, compiled into the Cambridge Corporate Distress Catalogue, the initial macroeconomic threat taxonomy developed by the Cambridge Centre for Risk Studies in 2014 and the collation of various other taxonomies of principal and emerging risks have been summarised to propose the Cambridge Taxonomy of Business Risks version 2.0, see .

3.1 Structure

The Cambridge Taxonomy of Business Risks version 2.0 is shown in above with definitions included as **Appendix A, B and C** at the end of this document. The taxonomy is available interactively online at the Cambridge Business Risk Hub.

This taxonomy attempts to organize the universe of business risks into a typology. It is organized into six broad classes of risks, see **Table 2**. Each of these main classes has several families of risks, and a family of risks may contain many types of risk. The hierarchy of Class : Family : Type is commonly used in structures of taxonomies and provides a useful organizing principle.

Table 2: Cambridge Taxonomy of Business Risks, v2.0 Class Definitions (Source: Cambridge Centre for Risk Studies).



Class	Class Definition
Financial	Threats from the macroeconomy, financial markets, global economic value chains, industry or company-specific events lead to underperformance of corporates.
Geopolitical	Political and criminal deterioration in society, change in ideology, leadership and regulation of the authorities, politically charged conflicts within or between nation states threaten business operations and prospects.
Technology	Targeted cyber attacks, critical infrastructure collapse, direct and indirect industrial accidents and the inability to keep up with advances in technology.
Environmental	Risks associated with acute natural hazard events, climate change, and human interactions with and exploitation of the environment.
Social	Socioeconomic trends in society, including evolving preferences, social norms, and demographics, as well as disease prevalence and developments in public health.
Governance	Threats from compliance with existing and emerging regulation, litigation and strategic and tactical management decisions.

3.1.1 Hierarchical System

For a risk classification system to be useful it has to have a manageable number of categories, but also of sufficient granularity to be applied in more detail when appropriate, any taxonomy should be hierarchical and capable of subdivision to increasingly fine levels of resolution. The Cambridge taxonomy is designed as hierarchical, with three ranks of taxonomy defined initially, roughly shadowing the taxonomy of the animal kingdom, with primary classes, families, and genus types. Further subdivision into sub-types can be added.

We have identified 6 primary classes and 37 families of risks. Each family is subdivided into risk types, with between 2 and 11 risk types in each family and a total of 175 risk types in the taxonomy.

Types can be further subdivided as appropriate. For example the family of 'Political Violence' has the 4 risk types:

- Social Unrest
- Terrorism
- Subnational Conflict & Civil War
- Coup d'État

'Terrorism' as a risk type can be further subdivided into different sub-types of terrorism for example by the ideological motivation, such as: 'Religious Militants'; 'Left-Wing Ideologues'; 'Right Wing Militias'; 'Eco-terrorism'; 'Regional Separatists' and others. Similarly, most of the risk types identified in the taxonomy can be further subdivided into variant sub-types. This subdivision requires domain expertise of the risk type and was carried out by Subject Matter Editors (SMEs) in each threat category when required. For simplicity we have not included any sub-types within this v2.0 taxonomy.

3.2 Categorization

For a risk classification system to be useful, it has to be tractable – a manageable number of categories and classes – and wide ranging to cover as many causes of risk as possible. This means that the taxonomy consists of a limited numbers of classes of risk that are necessarily large and imprecise. The intent is to capture the broad types of risks: risks that might impact businesses in a significantly different way to the others. Some risk types could be considered as belonging to more than one category, and our peer review processes identified differences in opinion about which category they best belong in, but we have made assignments that best align with the concept of causal similarity.

3.3 Versioning

This taxonomy has been through a number of iterations, modification, and review, by internal and external specialists, and is published here as version 2.0, 2019. There will be further iterations and new versions published as feedback is received and updates made. However, the Cambridge Taxonomy of Business Risks provides a useful framework and checklist of potential causes of business distress that organizations can review to determine their own prioritization and relevance of these risks.

3.4 Process of Development of the Taxonomy

A 'super-list' was originally created, of causes and events that appeared capable of causing corporate distress. Fitting criteria were identified and attributed to a cause using a loose labelling. A long-list of categories were initially identified using loose labelling, which were then reclassified into a more refined grouping of threat categories. Events were not always easily identifiable as risks that fitted the threshold definition criteria. Some criteria were difficult to establish from reports or case studies, but in these cases an inclusive approach was taken and if the event appeared significantly disruptive it was included.

3.4.1 Criteria for Inclusion

Threshold criteria are used to qualify a risk type. Criteria are intended to eliminate smaller types of risk that might cause localized severe impacts but not register on corporate balance sheets. The thresholds are used to prioritize the focus and resources of risk management.

3.4.2 Grouping by Cause

There are many different ways of categorizing risks – they could be divided by the consequences they trigger (many businesses prefer to label the consequences rather than the cause), they could be characterized by the systems that they affect, by their mechanisms of loss, by their timescales of impact, or other characteristic. We have chosen to categorize by cause.

The classes and families are considered as natural groupings of the causes of the risks. We have used a concept of 'causal similarity' to group and structure the taxonomy. Where causes are very dissimilar, then we can broadly assume that they may be independent.

3.4.3 Organizing by Clustering

We have organized risks by type into families using clustering principles of similarity and commonality. Many risk types could of course belong in several different families, and arguments could be made for individual risks to be allocated to different classes, but to avoid repetition we have assigned each risk type only once.

3.4.4 Independence and Correlation

The assumption of independence is a very useful one for statistical manipulation and combination of events. So as a first-order assumption, the primary taxonomy risk classes can be considered to arise from causes that are broadly independent.

We are currently researching in more detail how an event of one category could be correlated with underlying factors that would in fact make both categories more likely, or where one category could trigger a follow-on catastrophe of another category, or exacerbate its coincidental effects. However, the general structure preserves the concept of first-order independence for the initial trigger event. The hierarchy is structured by 'causal similarity' – the higher up the hierarchy, the more dissimilar the underlying causes are.

3.5 Under- and Overestimation of Risks in Company Risk Registers

Mapping the taxonomy to the risks reported in annual reports and primary causes of corporate distress yields some interesting findings, see **Figure 4**. Financial Risks are the dominant risks in annual reports and make up a large proportion of corporate distress cases. Geopolitical Risks affect market conditions and the impacts are not specific to an individual firm so we do not typically see examples of corporate distress primarily attributed to this risk class, although there are examples of companies seeing challenging conditions currently with trade tariffs arising from geopolitical tensions. Technology Risks are still not widely reported, yet they feature significantly in our corporate distress study. Environmental Risks show the inverse trend as Technology Risks, i.e. they are reported more often than they are shown to cause distress. Social Risks are self-reported at approximately the same proportion as they actually cause distress. Governance risk is the most distorted risk class, with their actual proportion of causes of distress being very much larger than the proportion of self-reported risks, suggesting that they are under-recognized as a business risk.

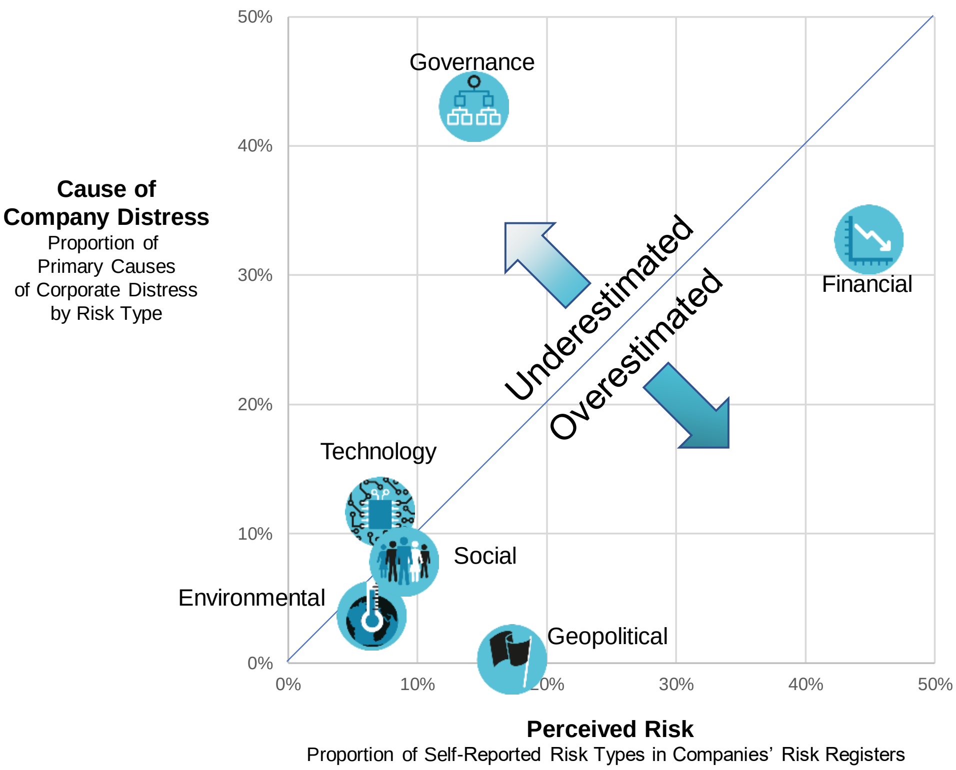


Figure 4: Underestimation and overestimation of risks in company risk registers, comparing the proportion of risks declared in Annual Reports with the proportion of primary risks responsible for corporate distress (Source: Cambridge Centre for Risk Studies).

4 Risk Classes

The primary categorisation is inteded to capture to the main causal divides in the typology of business risks.

4.1 Financial

Businesses manage a wide range of financial risks and it is common practice to do financial stress tests on a balance sheet. Typical exercises apply univariate shocks – testing what will happen if one variable, like interest rates change, or a different single variable such as movement in the exchange rate between two key currencies. There is a growing recognition that 'coherence' in financial stress testing is more useful – to understand how multiple macroeconomic variables move from a common underlying cause. These can be explored using realistic scenarios of financially significant events.

4.2 Geopolitical

Global businesses face many geopolitical risks in territories where they have business interests. Government change such as left or right-wing radicalism can change the business environment. Political violence and interstate conflict have the potential to interrupt global trade and alter consumption patterns in affect socieities. Country level risk features on risk registers with a focus on business environment changes list minimum wage increases, talent availablity, and sanctions. The rapidly shifting nature of geopolitical risk makes it a hard category to manage effectively for businesses.

4.3 Technology

Technology risks form a major part of the risk landscape of any modern business. The technology landscape is changing dramatically, and many businesses are investing in the digitization of their processes, and facing disruptive new technologies in their sectors. Cyber risks – the potential for malicious attacks or IT failures – are a growing concern for business executives. No longer confined to be an operational risk within the IT department, the potential impact of cyber attacks have become so significant that they register as a strategic risk, capable of impacting the earnings and viability of a business.

4.4 Environmental

International businesses face many environmental risks in the many sites and locations where they have operations, and also they are increasingly having to confront their responsibilities for maintaining the sustainability of the environment. Threats from natural hazards have the potential to cause damage to major facilities that are vital to the functioning of a business. These are relatively conventional risks, and are highly dependent on the geographical location and site conditions of the facilities. Businesses typically have hazard assessments and engineering safety evaluations for their major manufacturing, processing, distributions hubs, data centres, office locations and other major facilities that they rely on.

4.5 Social

Businesses face a wide variety of social risks of behavioural change and human action. These include changes in consumer preferences for their products and services, and changing trends in the ways that consumers purchase their goods, and perceive their brands. Health risks are also of concern as the risks from antimicrobial resistance or infectious diseases could have a global impact. Further, human capital and brand preception feature on numerous corporate risk registers due to the disruption capabilities and impact on the balance sheet.

4.6 Governance

Governance risks are the class of business risks that arise from issues of compliance with existing and emerging regulation, litigation and strategic and tactical management decisions. Corporate control of ethical behaviour is also featured in this category having the potential to significantly affect corporate culture and balance sheets. Management related issues such as board structure, CEO promience and management exeuctive of key strategic goals are also risks to consider as they have the ability to limit growth for a company. Product failure is a key risk that features in several risk registers.

5 Conclusions

A taxonomy of business risks has been proposed to assess the threat of events that have the potential to cause significant losses to corporate balanace sheets.

5.1 Knowing your Threats

We argue that the development of an extensive list of potential causes of future catastrophic disruption is more useful than assuming that these risks are unknowable or that they cannot be prepared for. The Cambridge Taxonomy of Business Risks version 2.0 provides at least a check-list of potential causes of principal and emerging risks.

5.2 An Educative Check List

This list demonstrates that there is a wide range of potential causes of business disruption and loss. It may be that the most useful application of the taxonomy is to provide illustrative information for risk managers to recognize that the risk landscape is more extensive than they might otherwise assume from their own experience. It may improve risk perception in the risk management community.

5.3 Terminology

The field of emerging risk identification is relatively young, and there is a wide variety of terminology in use, which we argue needs standardization and agreement around common usage. Thus we have proposed the following definition for emerging risks a new risk, changing risk, or novel combination of risks for which the broad impacts, likelihoods and costs are not yet well understood.[68]

5.4 Developing a Toolkit

To use this effectively the risks identified in the taxonomy have to be translated into effective tools for managers to assess their exposure to them. The Cambridge Business Risk Hub is an approach to compiling content around these risks for use by risk management community.

[68] This version is adapted following feedback from the definition we originally proposed in the following blog (Copic 2019)

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The following appendixes contain defintions of each level of the Cambridge Taxonomy of Business Risks.

Appendix A: Class Definitions

Table 3: Cambridge Taxonomy of Business Risks, v2.0 Class Definitions

Class	Class Definition
Financial	Threats from the macroeconomy, financial markets, global economic value chains, industry or company-specific events lead to underperformance of corporates.
Geopolitical	Political and criminal deterioration in society, change in ideology, leadership and regulation of the authorities, politically charged conflicts within or between nation states threaten business operations and prospects.
Technology	Targeted cyber attacks, critical infrastructure collapse, direct and indirect industrial accidents and the inability to keep up with advances in technology.
Environmental	Risks associated with acute natural hazard events, climate change, and human interactions with and exploitation of the environment.
Social	Socioeconomic trends in society, including evolving preferences, social norms, and demographics, as well as disease prevalence and developments in public health.
Governance	Threats from compliance with existing and emerging regulation, litigation and strategic and tactical management decisions.

Appendix B: Family Definitions

Table 4: Financial Family Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Family Definition
Economic Outlook	Macroeconomic states alter business prospects of individual corporates.
Economic Variables	Volatility in key economic variables adds to uncertainty in economic value chains and financial markets.
Market Crises	Malfunction or collapse of financial markets propagates wealth losses through the system across individual players including corporates.
Trading Environment	Disruptive policies or illegal activities impede trading in goods or services, inflicting damage to economies and businesses.
Company Outlook	Pending cases or restless investors negatively effect corporate operating and financial performances.
Competition	The activities to establish superiority over others in the industry negatively effects operating performance of companies that are more vulnerable.
Counterparty	Failure or rogue activities from related counterparties, including suppliers, customers, government, creditors, disrupt normal business operations.

Table 5: Geopolitical Family Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Family Definition
Business Environment (Country Risk)	Negative impacts from international relations uncertainty or unfavourable domestic political situations deteriorate the environments where businesses operate.
Corruption & Crime	Widespread illegitimate activities in authorities or society suppress business development and growth.
Government Business Policy	New regulation or changing regulation has negative effects on corporate financials typically by disrupting normal operations.
Change in Government	Shift in political and social ideology or change in leadership has disruptive impacts on existing business practices.
Political Violence	Politically charged violence within a nation state harms public safety and order, threatening labour and capital supply as well as business operations.
Interstate Conflict	Armed or unarmed combats among nation states drastically change international relations, doing harm to environments, business operations and prospects, trade and investor sentiment.

Table 6: Technology Family Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Family Definition
Disruptive Technology	Advances in technology that have the potential to disrupt businesses and the economy.
Cyber	Risk of business interruption, data loss, financial theft, or reputational from various external attacks of digital vulnerabilities.
Critical Infrastructure	Failure in supporting infrastructure such as electricity, gas, water, telecommunications that could cause a regional or national crisis.
Industrial Accident	Direct or indirect industrial accidents from fire, explosion, structural failure or nuclear accidents.

Table 7: Environmental Family Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Family Definition
Extreme Weather	Acute natural hazard events caused by short- to medium-term anomalies in hydrological and atmospheric processes.
Geophysical	Acute natural hazard events originating from geological processes in the solid earth.
Space	Acute hazard events caused by extraterrestrial objects that strike the Earth, and changes in ierplanetary conditions that affect conditions on Earth.
Climate Change	Acute and/or chronic physical hazards associated with long-term changes to the Earth's climate, as well as risks posed by society's responsive transition a low carbon economy.
Environmental Degradation	Deterioration of the physical environment and ecosystems as a result of destructive and exploitative human activities.
Natural Resource Deficiency	Deficiencies in natural resources caused by unsustainable human consumption at a rate exceeding the readily available supply.
Food Security	Shortages of food affecting large populations due to environmental factors and/or disease outbreaks in plant and livestock food sources.

Table 8: Social Family Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Family Definition
Socioeconomic Trends	Changes in societal standards and the composition of the labour market, affecting the macroeconomics and productivity of society.
Human Capital	Poor employment practices within an organisation affecting the attitudes of current employees, and limiting the attraction of potential employees.
Brand Perception	Negative information conferencing an organisation or customer dissatisfaction that harms public perception of the brand.
Sustainable Living	Consumers demand an organisation to offer sustainable and transparent practices, products, and services as heir preferences change.
Health Trends	A development in the state of public health with either positive or negative outcomes for a population.
Infectious Disease	Diseases caused by pathogenic microorganisms, that spread, directly or indirectly, within a population.

Table 9: Governance Family Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Family Definition
Non-Compliance	The risk of not compiling with existing or emerging regulation, reporting requirements or accounting standards.
Litigation	Risk of legal action against a corporate for negligence, product defects, management decisions, fiduciary duty or inaction.
Strategic Performance	Risks from strategic initiatives such as mergers and acquisitions, divestitures, joint ventures as well as poor investment.
Management Performance	Executive management failures in accomplishing strategic and transformation objectives.
Business Model Deficiencies	Inability to keep up with changing market and technology trends leading to the failure of a business model.
Pension Management	Pension fund and contribution management related risks.
Products & Services	Failure of a key product/service or innovation resulting in a significant financial and reputational loss.

Appendix C: Risk Type Definitions

Table 10: Financial Risk Type Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Risk Type	Risk Type Definition
Economic Outlook	Recession	A recession is technically defined as two consecutive quarters of negative GDP output growth. Any single quarter of negative economic growth provides a risk of recession. Multiple sustained quarters of negative GDP constitute a persistent recession. Despite the publicity given to them, recessions are rare. From 1960 to 2019 the USA only experienced six quarters of negative economic growth out of a total of 233 quarters.
	Stagnation	A stagnant or sluggish economy is defined as a period of persistently low economic growth. The term stagnation refers to a chronic lack of demand indicating that the economy is operating well below its operating capacity and therefore potential output. Such periods are characterised by low inflation and often lead to interest rates that go below zero to bring savings and investment into balance.
	Contraction	A contracting economy is defined as a period of lower than expected economic output, a drop in personal incomes, declining industrial production and weak retail sales. It is typically accompanied by rising unemployment and a loss in confidence in the economy. A contraction is often triggered by a stockmarket correction or crash.
	Credit Crisis	A credit crisis is a breakdown in the financial system caused by a sudden and severe disruption to the normal flow of money in an economy. A credit crisis is usually preceded by a credit crunch when lending to business and householders dries up causing cascading effects throughout the economy. In the worst case scenario a credit crisis can lead to a run on the banks.
	Steady Growth	In economic steady growth periods, all the fundamentals are growing at around their long term average values. The central bank is meeting inflation targets, interest rates are manageable and the economy is operating near full capacity. A typical economy spends more time in this state than in any other state.
	Expansion	This is a period of strong economic expansion. GDP is strong, interest rates are favourable and the total amount of credit in the economy starts to accelerate. There is a growth in business confidence which spurs significant investment across all sectors of the economy leading to a rises in the stock market, a rise in new building permits and an increase in house prices.
	Acceleration	This is the fastest growing but shortest lived economic state. It represents a period of accelerating and unsustainable growth contributing to a bubble. Stock prices grow the fastest over this period and business confidence reaches an all-time high. This period of short lived but accelerating growth usually occurs when an economy is already buoyant and the majority of other economic indicators show no signs of weakness.
	Peak	This period covers the time immediately before and immediately after an economy has reached its peak. As a lagging indicator, GDP growth remains strong throughout much of this period, but other forward looking indicators such as building permits, business confidence and share price index start to turn negative at different points over this period. This is a period marked by higher than average interest rates, high inflation and growing unemployment.
Economic Variables	Commodity Price Fluctuation	Volatile price changes in energy, metals, agriculture etc. due to supply or demand shocks disrupt domestic and international supply chains, negatively effecting corporate revenues and operating costs.
	Inflation	Sustained increase in the general price level of goods and services reduces purchasing power of the currency.
	Interest Rates	Bank rate set by the central bank impacts prevalent overnight rate and consumer lending rates.
Market Crisis	Asset Bubble	Price of an asset (e.g. stocks, housing, gold) rises quickly over a short period and cannot be justified by its underlying supply and demand.
	Bank Run	A large number of customers make withdrawals from a bank or other financial institution, typically as a result of concerns over its solvency. Liquidity in financial markets dries up to set off a systemic crisis.
	Sovereign Debt Crisis	Collapse of financial institutions, unsustainably high government debt and soaring yield spreads in government securities erode confidence in businesses and economies. Typically, country cannot refinance its government or bail out troubled financial institutions without third-party assistance.
	Flash Crash	A rapid and deep fall in security prices in an extremely short time span, frequently triggered by black-box and high-frequency trading and resulting in loss and recovery of billions of dollars in a matter of minutes and seconds.[69]
	Fraudulent Market Manipulation	Use misleading or false information to inflate or deflate security prices or to influence market behaviour for personal gains.
	Cryptocurrency Failure	Irreversible devaluation of bitcoins or altcoins, or extremely volatile value fluctuations end up loss in popularity and even no use of cryptocurrencies.
	Reserve Currency Shift	Change of dominant currencies or safe-haven assets due to financial or political reasons destabilises macroeconomic indicators and financial markets.
Trading Environment	Tariff Dispute	Increase in tariffs between states in response to each other's trade barriers leads to decrease in cross-border economic activities, exerting ripple effects through global supply chains.

[69] (Bozdog et al. 2011)

	Cartel Manipulates Market	A group of independent producers (e.g. OPEC) collaborate or conspire to fix market price, limit supply or increase bargaining power against other counterparties for private gains.
	Organised Crime	International, national or local groupings of highly centralised enterprises run by criminals engage in illegal activities for profits such as money laundering, counterfeiting and tax evasion.
Company Outlook	Hostile Takeover	An acquirer attempts to take control of a target without board consent, by going directly to shareholders or fighting to replace management.
	Credit Rating Downgrade	Deterioration in creditworthiness or credit outlook assessed by credit agencies (S&P, Moody's and Fitch) negatively effects company's ability to borrow money on the markets.
	Investor Negative Outlook	Unfavourable investor sentiment on corporate prospects influences stock trading and investment growth. This has psychological cause not based on fundamentals.
Competition	Disruptive Competitor	Entrants or existing businesses in the industry bring about new technologies, new products, new sources of supply and compete through quality rather than price.
	Aggressive Competitor	Competitors initiate a price war where each player tries to undercut the others and capture greater market share, typically resulting in revenue decrease.
	Fraudulent Competitor	Competitors engage in illegal activities such as counterfeiting in order to gain fraudulent advantages over others, causing financial and reputational damage across the industry.
	Intellectual Property Theft	Stealing people or companies of their ideas, inventions and creative expressions, including trade secrets, intellectual property, proprietary products or business plans, leads to loss of market shares and revenues.[70]
Counterparty	Supplier Failure	Major suppliers fall distressed or go bankrupt so that business operations are disrupted.
	Customer Failure	Major customers or clients fall distressed or go bankrupt so that revenue streams are disrupted.
	Government Failure	For political or financial reasons, the government defaults on its contractual obligations with the company, provoking significant uncertainty around business prospects.
	Creditor Failure	Major creditors fall distressed or go bankrupt so that companies are financially constrained due to lack of lines of credit.
	Counterparty Fraud	Counterparties involved in transactions with a company default on their contractual obligations.

Table 11: Geopolitical Risk Type Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Risk Type	Risk Type Definition
Business Environment (Country Risk)	Talent Availability	Due to change in political perceptions of the country, outbound migration of talents results in shrinkage of talent pools, which increases time to hire, impairs quality of hire and raises cost to hire for the wide business community.
	Industrial Action	Usually organised by unions against companies, widespread discontent embodied by strike, riots, civil commotion and protest or slowdown significantly limits corporate productivity and weakens its bargaining position.
	Minimum Wage Hike	Prevalent increase in minimum wage rates across demographic groups disrupts corporate operating strategies at least in the short term, raising labour costs and reducing bottom line profits.
	Sanctions	International sanctions regimes, geo-economics, trading blocs, bi/multi-lateral negotiations and disputes, court penalties, trade bans or other coercive measures within or between nation states out of political reasons threaten business prospects of affected corporates and shock global supply chains.
	Territorial Disputes	Dormant or militarised disagreement over land possession arising from diverging national interests, disputes over international law, economic exploitation, protection of lines of communication, resource management and economic exclusion zones disrupt business operations in affected countries or regions.
	Logistics Restrictions	Bottlenecks or limits of access to key global transport routes due to geopolitical restrictions impact the operational viability and profitability of relevant corporates.
Corruption & Crime	Corruption Deterioration	The abuse of power for personal gain (e.g. bribery, nepotism, kleptocracy) threatens security by enabling crime and allows economic inefficiencies by creating business uncertainty, slowing processes and imposing additional costs.[71]
	Crime Wave/Piracy Increase	More crimes than usual are committed, creating business uncertainty and dampening investor sentiment.
	Slavery Practices	Individuals are forced to work, trapped and controlled by an "employer" through abuse, dehumanised and physically constrained.[72]
Government Business Policy	Emerging Regulation	News about upcoming regulation or policy changes creates business uncertainty, typically accelerating corporate capital spending to pre-empt potential unfavourable impacts.
	Corporation Taxation Rate Hike	The government stipulates widespread increase in taxes for political or fiscal reasons, which results in decrease in household disposable income and consumption.
	Diverted Profits Tax	Change in government policies to counteract tax evasion by large groups that artificially divert profits from the taxable presence or avoid creating a taxable presence.[73]

[70] (Federal Bureau of Investigation 2019)
[71] (European Commission, Migration and Home Affairs 2016)
[72] (Anti-Slavery International 2019)
[73] (UK Government 2018)

	Nationalisation	The government transforms private assets under public ownership with or without compensating the former owners. The threat comes from the policy being viewed as excessive government inference in economic affairs.
	Confiscation of Assets	The government makes confiscation orders to deprive corporate assets which are claimed to be crime benefits.[74]
	Privatisation	The government sells state-owned businesses to private investors, or private entities become responsible for implementation of government programmes or services.
	License Revocation	The authorities cancel rights of a company to do certain businesses, causing abrupt and severe disruption to normal operations.
Change in Government	Nationalism/ Protectionism	Promoting interests of own nation often to the exclusion or detriment of interests of others, including protectionist policies that restrict trade, results in declining economic growth and welfare as well as damage to producers and consumers.
	Left-Wing Radicalism	Regime push for fundamental changes to capitalism, which is associated with communism and anarchism, reshapes regulatory landscape and thus disrupts business operations.
	Right-Wing Radicalism	Regime push towards extreme nationalism, with authoritarian tendencies, reshapes regulatory landscape and thus disrupts business operations.
	Populism	Opposing elitism, the ideology to represent the unified will of the people results in leadership change, reshaping regulatory landscape and disrupting business operations.
	Environmentalism	Social movement advocating environmental protection and reducing negative impacts on participants in ecosystems, pushes changes in regulations and policies that disrupt business operations.
Political Violence	Social Unrest	There is a mass act of civil disobedience (e.g. demonstration, riot) where the participants become hostile towards the authorities, and the authorities have difficulties in maintaining public safety and order.[75]
	Terrorism	Unlawful use of violence and intimidation against civilians for political reasons, perpetrated by individuals or groups inspired by domestic or international extremist ideologies, damages public safety and order.[76]
	Subnational Conflict & Civil War	Localised regional separatism through to large-scale, armed violence between organised groups within the same state or country, typically to change leadership, damages public safety and order.
	Coup d'État	Unconstitutional seizure of power to overthrow existing authorities significantly disrupts public safety and order.
Interstate Conflict	Conventional War	Warfare conducted using conventional weapons and battlefield tactics to target military facilities and population and economic centre negatively effecting business prospects and investor sentiment.
	Asymmetric War	War between belligerents with significantly different levels of military power threatens public safety and order, dims business prospects and suppresses investor sentiment.
	Nuclear War	Warfare conducted using nuclear weapons results in massive casualties and halt of social life. Loss of labour and capital and damage of environments have lasting negative impacts on businesses.
	Cold War	Geopolitical tension without large-scale direct fighting but with each side supporting regional conflicts as proxy wars disrupts international trade and business activities.

Table 12: Technology Risk Type Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Risk Type	Risk Type Definition
Disruptive Technology	E-Commerce	A rapid shift in consumer purchasing behaviours from in-store to online shopping.
	Gig Economy	A shift to short-term contract and freelance work of independent contractors.
	Artificial Intelligence	Failure to adapt AI techniques into operations could limit growth and consumer engagement with potential for misconfiguration and significant job loss.
	5G Technology	5G will allow for the processing of more data, increasing the amount of data that is stored, processed and protected by companies.
	Blockchain	Adaption of system aimed at reducing transaction settlement times and improving cash flow exposes corporates to an unregulated global technology.
	Robotics & Automation	Increase in automation via software and robots will significantly increase unemployment and increase dependencies on the internet.
	Augmented/Virtual Reality	Advancement in the way people experience their surroundings could have a major impact on mental well-being and safety of users.
	Cryptocurrency	Decentralised cryptocurrencies, such as Bitcoin, enable wealth creation and the movement of money that is untraceable harbouring criminals and money launderers.
	Autonomous Vehicles	Autonomous vehicles will transform how goods and people are transported, greatly reducing employment.
	Drones	Drones will transform how goods are transported, greatly reducing employment.
	Medical Advances	A new advancement in medical technology that significantly improves the health outcomes of individuals affected by a specific medical condition.
Cyber	Data Exfiltration	The breach of privacy of customer accounts, passwords, contact management databases, healthcare and financial account data.

[74] ("Confiscation and Ancillary Orders Pre-POCA: Proceeds of Crime Guidance" 2009)
[75] (United States Army 2004)
[76] (Federal Bureau of Investigation 2019)

	Contagious Malware	Malicious software that can limit or restrict access to key digital systems, attackers may demand payment to unlock key critical systems or completely wipe or corrupt all data and software.
	Cloud Outage	Outage of a key cloud service provider (either first party or third party) causing downtime of critical digital systems.
	Financial Theft	Corporate financial theft attack or large scale individual consumer financial theft.
	Distributed Denial of Service	Attackers overwhelm a key website or other online systems with too much traffic to render the website inoperable.
	Internet of Things	Manipulation of data flows of IoT devices with the intent to cause disruptions.
	Industrial Control System Compromise	Targeted attacks on industrial control systems (ICS), safety instrumented systems (SIS), industrial internet of things (IIoT), energy management systems (EMS) and so on with the potential to cause physical damage and loss of life.
	Internet Failure	Disruption of submarine communication cables causing blackouts or slowdowns of the internet.
Critical Infrastructure	Power	Prolonged or rolling power outages limit operations in certain regions.
	Transport	Prolonged or intermittent transports (rail, sea, air or roads) limit operations in certain regions.
	Telecommunications	Prolonged or intermittent telecommunications limit operations in certain regions and potentially globally.
	Satellite Systems	Loss of satellite systems limit operations globally.
	Water & Waste	Restricted water or waste and sewage disposal leads to limited operations at key facilities.
	Fuel	National or global fuel supply restrictions (i.e. fuel shortages) limits the movement of goods.
	Gas	National or global gas supply restrictions (i.e. gas shortages) or gas system outages limits access to this key utility.
Industrial Accident	Fire	Major fire at key facility directly affects operations or impacts supply chain.
	Explosion	Explosion at key facility directly affects operations or impacts supply chain.
	Pollution	Major pollution event at key facility directly affects operations or impacts supply chain.
	Structural Failure	Structural failure of key facility directly affects operations or disrupts supply chain.
	Nuclear	Fallout from a major core meltdown at a nearby nuclear facility interrupts operations directly or via supply chain limitations.

Table 13: Environmental Risk Type Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Risk Type	Risk Type Definition
Extreme Weather	Flood	The temporary overflow of water that inundates normally dry land: on floodplains (riverine flood); along coasts (coastal flooding); or at the location of intense rainfall (flash flooding).
	Tropical Windstorm	A rapidly rotating storm system, formed over warm, tropical seas, and characterised by a low-pressure centre, spiral bands of intense rainfall, and strong winds. Depending on their location, they are referred to as hurricanes (Atlantic, Northeast Pacific), typhoons (Northwest Pacific(, or cyclones (South Pacific and Indian Ocean).[77]
	Temperate Windstorm	A generic term for extreme weather phenomena, formed under a variety of meteorological conditions, that bring some combination of heavy precipitation (including rain, hail, or snow), high winds, and lightning.
	Drought	A prolonged period of below-average precipitation that produces a shortage of water for an ecosystem. Drought is not solely a physical phenomenon because its impacts can be exacerbated by human activities and water demands.[78]
	Freeze	A period of abnormally cold air temperatures over a widespread area typically lasting two or more days. A 'freeze' occurs when the air temperature is below (32˚F/0˚C). The defined temperature threshold varies by location and climate.[79]
	Heatwave	A period of abnormally hot and/or humid weather over a widespread area typically lasting two or more days. The defined temperature threshold varies by location and climate.[80]
	Wildfire	An uncontrolled and unintentional fire in a natural setting of combustible vegetation that spreads based on environmental conditions (including wind and topography). Wildfires can be triggered by lightning or human actions.[81]
Geophysical	Earthquake	A sudden movement of a block of the Earth's crust along a geological fault and associated ground shaking.[82]
	Volcanic Eruption	A discharge of lava, ash, and gas from a volcanic vent in the Earth's surface.
	Tsunami	A series of waves, typically in an ocean or large lake, generated by a displacement of a massive volume of water through underwater earthquakes, volcanic eruptions, or landslides. Tsunami waves travel at very high speed across the ocean but slow down and grow steeper as they reach shallow water.[83]

[77] (Guha-Sapir, Below, and Hoyois 2016)
[78] (Guha-Sapir, Below, and Hoyois 2016)
[79] (Guha-Sapir, Below, and Hoyois 2016)
[80] (Guha-Sapir, Below, and Hoyois 2016)
[81] (Guha-Sapir, Below, and Hoyois 2016)
[82] (Guha-Sapir, Below, and Hoyois 2016)
[83] (Guha-Sapir, Below, and Hoyois 2016)

Space	Solar Storm	Disturbances of the upper atmosphere and near-Earth space that can disrupt a wide range of technological systems, caused by various eruptive phenomena (including coronal mass ejections, solar proton events, and solar flares) occurring on the surface of the sun.[84]
	Astronomical Impact Event	The collision of the Earth with a meteoroid, asteroid, or comet with significant physical and biospheric consequences.
Climate Change	Physical	Physical risks resulting from climate change can be extreme weather event driven (acute) or longer-term shifts (chronic) in climate patterns.[85]
	Liability	The risk of litigation arising from breaches of tort, consumer, corporate, and financial risk management laws. In particular, claims will arise under three broad categories: failure to mitigate impacts of climate change; failure to adapt to the impacts of climate change; and claims for failure to disclose climate-related risks to shareholders.[86]
	Transition	The financial and reputational risks associated with the nature, speed, and focus of policy, legal, technology, and market changes as society transitions to a low-carbon economy.[87]
	Increase in Extreme Weather	An increase in the frequency and severity of extreme weather events.
	Sea Level Rise	The average long-term global rise of the ocean surface as a result of climate change.
	Ocean Acidification	The process by which the increasing atmospheric carbon dioxide concentration causes a decrease in the oceanic pH level, with significant consequences for marine ecosystems.
	Lower Carbon Economy	The financial and reputational risks associated with the nature, speed, and focus of policy, legal, technology, and market changes as society transitions to a low-carbon economy.
Environmental Degradation	Waste & Pollution	The introduction of undesirable or hazardous substances to the environment with temporary or irreversible adverse impacts. Hazardous wastes comprise biological, chemical, and radioactive substances.
	Biodiversity Loss	A reduction in the variety of species (plant or animal) on Earth or in a certain habitat.
	Ecosystem Collapse	A drastic, possibly sudden and/or irreversible, transition of an ecosystem beyond a bounded threshold. Collapse often involves a mass extinction and loss of defining features, a transformation of identity, and/or replacement by a new ecosystem.[88]
	Deforestation	The permanent destruction of forests from land which is then made available for other uses, with impacts on the global climate and regional hydrological and ecological systems.
	Soil Degradation	The loss of soil or degradation of soil quality, resulting in loss of fertile land, increased pollution and sedimentation in waterways, and/or more severe flooding.[89]
Natural Resource Deficiency	Fossil Fuels	A deficit in fossil fuel resources (buried combustible geologic deposits of organic materials) where consumption exceeds the readily available supply.
	Biogeochemicals	A deficit in biogeochemical (naturally chemical substances that cycle through biotic and abiotic compartments of Earth) resources where consumption exceeds the readily available supply.
	Raw Materials	A deficit in basic materials used in the production of goods where consumption exceeds the readily available supply.
	Water	A deficit in water resources where consumption exceeds the readily available supply.
Food Security	Animal Epidemic	An outbreak (unusual increase in the number of cases) of an infectious disease in an animal population, which already exists in the region or population concerned; or appears in a previously unaffected region.[90]
	Plant Epidemic	An outbreak (unusual increase in the number of cases) of an infectious disease in a plant population, which already exists in the region or population concerned; or appears in a previously unaffected region.[91]
	Famine	A catastrophic food shortage affecting a large population due to climatic, environmental, and socioeconomic factors.[92]

Table 14: Social Risk Type Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Risk Type	Risk Type Definition
Socioeconomic Trends	Ageing Population	The increase in the share of older people in a population resulting from the decline in fertility and improvement in survival that characterise demographic transition, with significant implications for public services and economic productivity from labour shortages.[93]
	Gender Imbalance	The disparity between males and females within a population.
	Wealth Inequality	The disparity in the distribution of wealth, income, and opportunities in a population.[94]
	Poor Educational Standards	Deficient standards of education result in the failure of individuals within a population, or of an entire population, to acquire the knowledge and skills required to compete in society, thereby limiting productivity.[95]

[84] (Hapgood et al. 2012)
[85] (Task Force on Climate-Related Financial Disclosures (TCFD) 2017)
[86] (Garton 2018)
[87] (Task Force on Climate-Related Financial Disclosures (TCFD) 2017)
[88] (Bland et al. 2018)
[89] (WWF 2019)
[90] (Guha-Sapir, Below, and Hoyois 2016)
[91] (Guha-Sapir, Below, and Hoyois 2016)
[92] (Guha-Sapir, Below, and Hoyois 2016)
[93] (United Nations, Department of Economic and Social Affairs, Population Division 2017)
[94] (United Nations, Department of Economic and Social Affairs, Development Policy and Analysis Division 2015)
[95] (Hasselhorn et al. 2014)

	Migration	The movement of people, within or across borders, with the intention of settling, temporarily or permanently, at a new location, with socioeconomic and political consequences (including on the labour market and public services).
Human Capital	Failure To Attract Talent	The failure of an organisation to incentivise new employees to join the workforce and/or engage existing employees so that they leave to take new opportunities.
	Gender & Diversity	A lack of diversity (including in gender, gender identity, ethnicity, age, religion, sexual orientation, disability, and education) in an organisation's workforce due to negligent or discriminatory employment practices. This results in 'groupthink' (a failure to represent different viewpoints) limiting performance, and may produce reputational and/or liability risks.
	Labour Disputes & Strikes	Disputes over employee working conditions or compensation results in the mass refusal of employees to work, thereby disrupting or stopping an organisation's operations.
	Loss of Key Personnel	The loss of a person who is fundamental to an organisation's operations or performance, such as executives, managers, or personnel with highly specialised skill sets, and so is difficult to replace.
	Employee Misconduct	Behaviours or actions of employees intended to benefit them personally at the expense of an organisation, or which result in employer liability for the consequences of those actions.[96]
Brand Perception	Fake News	Information that has been deliberately fabricated and disseminated with the intention to deceive and mislead others into believing falsehoods or doubting verifiable facts.[97]
	Negative Media Coverage	Negative information concerning an organisation, whether factual, exaggerated, or fabricated, that is disseminated to the public, thereby harming public perception of the brand.
	Key Influencer Disruption	Negative information concerning an organisation, whether factual, exaggerated, or fabricated, that is disseminated to the public by key influencers, thereby harming public perception of the brand.
	Negative Customer Experience	When a customer is dissatisfied by a service or product and shares this negative experience in public, particularly via social media, thereby harming public perception of the brand.
Sustainable Living	Consumer Activism	A social movement by activists that negatively impacts an organisation in order to protest and influence its actions, often by boycotting products or services.[98]
	Sustainable Purchasing	A shift in consumer purchasing preferences towards sustainable products, services, or brands, as consumers grow more aware of environmental, social, and/or economic sustainability issues.
	Supply Chain Provenance	The demand on an organisation, or its failure, to assure the provenance of products and services, in terms of how they are sourced, manufactured, stored, and delivered to customers.
	Diet	A shift in a population's dietary preferences, influenced by scientific advice or popular culture, due to perceived health, social, or other benefits.
Health Trends	Obesity	An increased prevalence of noncommunicable diseases (NCDs) in a population, resulting from obesity as a (modifiable or metabolic) risk factor. The main types of NCDs are cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes.[99]
	Longevity	An increase in the average life expectancy of a population.
	Antimicrobial Resistance	Antimicrobial resistance (AMR) is the ability of a microorganism (like bacteria, viruses, and some parasites) to stop an antimicrobial (such as antibiotics, antivirals and antimalarials) from working against it. As a result, standard treatments become ineffective, infections persist and may spread to others.[100]
	Medical Breakthroughs	A new advancement in medical research, such as a cure or treatment that significantly improves the health outcomes of individuals affected by a specific medical condition.
	Healthcare	The deficiency, failure, or collapse of a public health system affects the average health outcomes of a population.
	Social Care	The deficiency, failure, or collapse of a social welfare system results in a failure to fulfill basic human needs and affects the well-being of a population.
Infectious Disease	Influenza Pandemics	A global epidemic caused by a new influenza virus to which there is little or no pre-existing immunity in the human population. They are impossible to predict; and may be mild, or cause severe disease or death.[101]
	Coronavirus-like Epidemics	A large family of viruses that primarily infect the upper-respiratory tract, causing illnesses ranging from the common cold to Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS).[102]
	Viral Hemorrhagic Fevers	A general term for a severe illness, affecting multiple organ systems and sometimes associated with bleeding, caused by several distinct families of viruses. Examples include Ebola, Marburg, Yellow Fever, and Lassa.[103]
	Preventable Disease Outbreaks	Diseases for which an effective preventive vaccine exists, but the failure of public health systems to control such a disease results in an epidemic. Examples include Cholera, Malaria, Measles, and Rotavirus.[104]

[96] (Norton Rose Fulbright 2016)
[97] (Ethical Journalism Network 2019)
[98] (Kozinets and Handelman 2004)
[99] (World Health Organisation 2018)
[100] (World Health Organisation 2018b)
[101] (World Health Organisation 2019c)
[102] (National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases 2019)
[103] (World Health Organisation 2019a)
[104] (World Health Organisation 2019b)

	Unknown Emergent Diseases	Diseases that emerge in a population caused by pathogens that were previously undetected or unknown to cause human disease.[105]

Table 15: Governance Risk Type Definitions, Cambridge Taxonomy of Business Risks, v2.0.

Family	Risk Type	Risk Type Definition
Non-Compliance	Emerging Regulation	News about upcoming regulation or policy changes creates business uncertainty, typically accelerating corporate capital spending to pre-empt potential unfavourable impacts.
	Internal Corruption & Fraud	Internal corruption or fraud causing violation of a key regulation.
	Negligence	Accidental violation of a key regulation.
	Revised Accounting Standards	Continuous changes to the global accounting standards creates uncertainty around reporting requirements.
	Occupational Health & Safety	Employee and consumer health and safety regulation is continuously evolving and becoming more complex.
Litigation	Private Lawsuit	Litigation filed by individual consumer or shareholder alleging corporate wrong doing.
	Mass Tort	Litigation filed by a larger group of consumers or shareholders alleging corporate wrong doing, with plaintiffs treated as individuals.
	Class Action	Litigation filed by a larger group of consumers or shareholders alleging corporate wrong doing, with plaintiffs treated as a group.
Strategic Performance	Divestitures	The risks associated with a partial or full disposal of an asset or business through sale, exchange, closure or other financial means.
	Joint Ventures	The risks associated with a separate business entity create by two or more parties with shared ownership.
	Mergers & Acquisitions	The risks associated with the joining of business entities where full ownership is transferred to controlling party.
	Restructuring	The risks associated with a complete financial or organisational restructuring.
	Poor Investment	Investment strategy failure leading to financial loss.
Management Performance	Executive Mismanagement	Rough executives who are making decisions against the consensus of the executive team, who are not effectively completing their jobs or who have a majority share in the company.
	Ineffective Board	Risks arising from an ineffective board in terms of experience, industry representation, gender balance and CEO presence.
	Management Execution Failure	Failure by management to execute a key strategic objective due to lack of communication or motivation.
Business Model Deficiencies	Technology	Failure of the business model to adapt to the latest technology trends.
	Customer Preference Change	Failure of the business model to adapt to shifting consumer preferences.
Pension Management	Contribution Management	Poor management of the pension contributions.
	Fund Management	Poor management of the pension investment fund.
Products & Services	Product Defect/Failure	Failure of a key product or service that causes customer harm.
	Innovation (R&D) Failure	Failure of a key innovation project or strategy.

[105] (World Health Organisation 2018a)

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