Enterprise Risk Management's Role in Climate Change and the Insurance Industry

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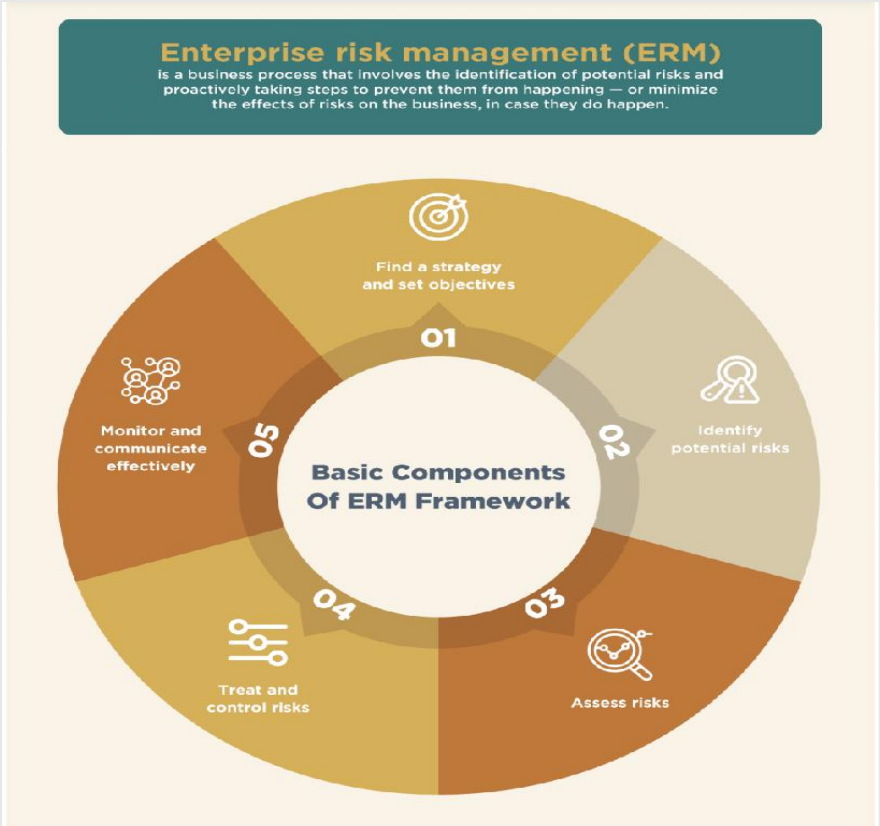
Introduction

Weather-related events have and will continue to affect the physical, legal, and regulatory environments both directly and indirectly for insurance companies. Humans impact how the climate changes both in the short term and the long term, increasing the variability in weather and the longer-term weather patterns effecting future events.

Enterprise risk management (ERM) is a firm-wide strategy to identify and prepare for hazards with a company's finances, operations, and objectives. ERM allows managers to shape the firm's overall risk position by mandating that certain business segments engage with or disengage from particular activities. [1]

While each organization tailors the ERM process for its needs, the basic process is outlined in the chart below and addressed in more detail within a blog by Jelvix. [2] The definitions of each component follow on the next page.

In addition, climate change is a global Rrisk, but for this article the focus is on the impact on insurance products within the United States. This paper is also intended not to discuss instituting ERM for an organization but to outline how climate change may be incorporated into the current process. Regulators are expecting some form of commentary within an organization's Own Risk Solvency Assessment (ORSA).



Source: "Guide to Enterprise Risk Management," Jelvix.com. Reprinted with permission.

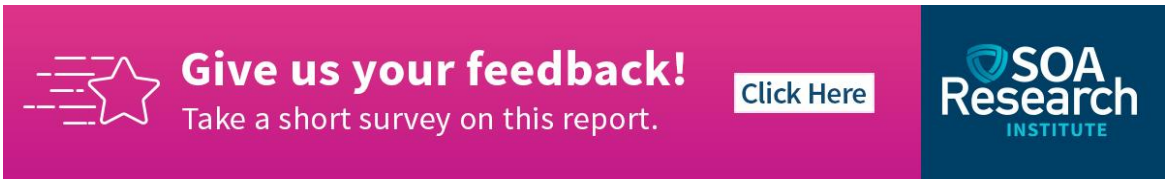
As noted in the Jelvix blog:

The adoption and practice may be tailored to align with the company's vision, but the basic framework and processes remain mostly unchanged. Here are the basic components of most enterprise risk management frameworks:

1. *Find a strategy and set objectives: the first step in defining an ERM framework is to clearly understand your objectives as an organization to find a risk management strategy that perfectly aligns with the company's objectives and values.*
2. *Identify potential risks: a clear understanding of every single risk you face as a business is imperative. You can tackle a problem that you are aware of and understand; this also applies to risk management. Make a comprehensive list of all the risks you face as an organization, from the most to the very least threatening; this will better clarify the company's risks. In addition to this, an organization should also estimate its risk tolerance (the maximum level of risk the organization can handle) and risk appetite (the level of risk a business is willing to pursue).*
3. *Assess risks: next is to assess every individual risk that has been identified. One of the major importance of enterprise risk management is that it aids in differentiating the risks a company can control from those it has no control over. This helps with resource allocation and better risk management.*
4. *Treat and control risks: following the identification and assessment of risks, there must be a decision on how these organization threats should be approached and managed appropriately. The major objective of a robust ERM framework is to be deliberate about managing risks. Nothing is left to chance. Every action from risk avoidance to mitigation and acceptance must be decided upon by management.*
5. *Monitor and communicate effectively: since risks are distributed among various business departments, it becomes imperative that the management communicate ways to manage potentially risky events to each*

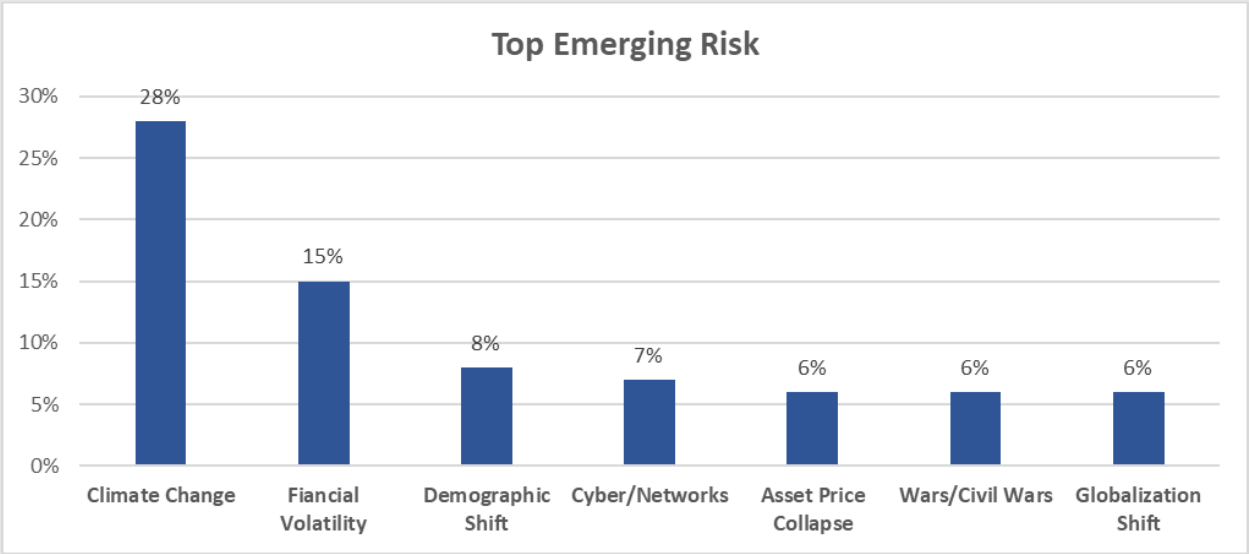
department proactively. Communicating and coordinating between different departments is essential for the success of ERM.

[Oleksandr Andrieiev, CEO & Co-founder Jelvix]



Climate Change within the ERM Process

The chart below identifies Climate Change as one of the top emerging risks in 2023. [3] As such, it should be addressed within an organizations ERM process. This will mean determining if and how Climate Change fits within the organizations Risk Appetite, Risk Tolerances, and Board of Directors level discussions.



Source: "16th Annual Survey of Emerging Risks," SOA Research Institute

Climate change must first be defined to properly identify the risks faced by the organization. Climate change refers to the long-term change in global weather patterns. This encompasses global warming, in addition to a broad range of changes that are happening to the planet, such as rising sea levels, shrinking mountain glaciers, accelerating ice melt in Greenland, Antarctica, and the Artic, and shifts in flower/plan blooming times. [4]

Changes in climate conditions produce impacts on both the frequency and magnitude of certain natural catastrophe events, which has been part of the discussion for catastrophe modelers for the last several years. However, the associated environmental conditions influencing land usage, investments (e.g., sustainable assets), and potential health related situations (e.g., extreme heat) also hold implications for Insurance as societal pressures, just now emerging, alter the regulatory, social, and legal landscapes for insurers.

The Society of Actuaries (SOA) Climate Risk Certificate Course Section - Climate Risk 102: Actuarial Climate Risk Analysis identifies three Climate Risk Classifications:

1. Physical Risk – Risk from individual natural events and long-term transformations to the physical environment. An example is excess heat waves increasing death and hospitalizations from heatstroke, respiratory, cardiovascular, or cerebrovascular conditions.
2. Transition – The various risks associated with decarbonization, including the risk of not being able to successfully decarbonize. Examples could be new industry regulations or laws that mandate certain decarbonization benchmarks or impose new compliance methods, which will likely increase costs.

3. Liability – The risk of new forms of liability for insurers that will arise from climate change. Examples could include litigation against company executives arising from business practices surrounding climate change or negligence claims that result from insuring those actively involved in climate change litigation.

An organization needs to do a thorough review and quantification of climate change and how it relates to the risks above. Historical data is not reliable given the changing conditions to the environment introduced by climate change. Therefore, tools such as Scenario Analysis and Stress Testing are critical for understanding the impact from the array of risks impacting an organization.

The Society of Actuaries (SOA) Climate Risk Certificate Course Section - Climate Risk 102: Actuarial Climate Risk Analysis suggests the following questions and considerations when using these tools:

Considerations

- What are the short-term and long-term time horizons for the organization.
- What are the impacts on key goals and strategies for the organization.

Questions

- What exposures are most climate-impacted across underwriting and investments?
- What level of climate related stress can fit within a company's risk appetite?
- What climate related financial metrics can be used in decision making?
- What is the Green House Gas (GHG) emissions of suppliers, clients, and investee companies?
- What would a company's current exposure look like when adjusted to take into account the effect of climate change in a 2˚ Celsius global warming scenario at different time horizons?

The considerations and questions above are suggestions. Any set of conditions must consider the unique situation of each organization.

Risk Assessment Quantification Tools – Scenario Analysis and Stress Testing

SCENARIO ANALYSIS

Scenario analysis is a process of examining and evaluating possible events or scenarios that could take place in the future and predicting the various feasible results or possible outcomes. [5]

When performing scenario analysis, an organization generates different future conditions related to the environment as impacted by climate change. This translates into discrete scenarios that include assumptions involving loss situations, investment changes, regulatory actions, and other drivers of the business.

While natural catastrophe events occur with regularity, the variability in the underlying conditions of the surroundings at the time of manifestation makes scientifically based catastrophe models a necessity.

Modelers such as RMS (now Moody's) have climate risk models [6] for use in conjunction with natural catastrophe estimation today. For property-oriented risks, this information is, and has been, included as regulatory permissions allow for pricing products, as well as used for obtaining reinsurance, initial event reserve estimation, potential risk mitigation, and discussing capital positions for organizations. However, to the extent that the science related to

areas such as risk mitigation is not fully tested, it is incumbent upon those utilizing results adjusted for these assumptions to fully understand the scope, the theory, and associated issues related to usage of that science. [7] [8]

This type of scenario analysis can work well for physical risks. But for transition risk and liability risk, this is not sufficient. The following organizations provide scenarios for use in analysis:

Network for the Greening of the Financial System [9] (NGFS)

This organization produces scenarios factoring in Gross Domestic Product (GDP), Carbon Prices, unemployment, production capacity, and inflation to promote the transition of a low carbon economy. Their scenarios range from orderly transitions to a decarbonized economy with net zero by 2050, to a delayed, disorderly transition to a decarbonized economy where there is only a 67% chance of limiting warming to 2°C, to no transition to a decarbonized economy, where we keep current policies and 3°C warming occurs.

Intergovernmental Panel on Climate Change [10] (IPCC)

The IPCC scenarios factor in population growth, mean and extreme temps, precipitation, wind speeds, and sea level rise. There are four scenarios, RCP8.5, 6.0, 4.5, and 2.6. The naming is based on the radiative forcings in W/m2 (watts per square meter), not the temperatures expected. Iteration 6.0 of the IPCC reports introduce Shared Socioeconomic Pathways (SSP). These are intended to capture global and local effects, most projections at a country level. These are combined into a single Scenario, example SPP1-2.6.

International Energy Agency [11] (IEA)

The IEA collects, assesses, and disseminates statistics on energy supply and demand. They create scenarios annually in their World Energy Outlook report. The scenarios are Net Zero Emissions (NZE) by 2050, Announced Pledge Scenarios (APS), and Stated Policies Scenarios (Steps) all of which rely on various government commitments for energy reduction and transition.

The Bank of England [12] (BoE)

The BoE created the Climate Biennial Exploratory Scenario (CBES) based on the NGFS scenarios. There are three scenarios: Early Action, Late Action, and No Additional Action.

In addition to these scenarios, there are various internet tools available for use:

The EN-ROADS Simulator [13]

This tool is from Climate Interactive and the MIT SLOAN Sustainability Initiative. Users can modify variables such as energy supply, population, economic growth, carbon removal, etc. to determine expected warming by 2100.

The Climate Narrative Tool [14]

This tool is from the Scenario Analysis Working Group of the Prudential Regulation Authority and Financial Conduct Authority's Climate Financial Risk Forum. This tool represents output from the cross-industry Scenario Analysis Working Group of the Prudential Regulation Authority and Financial Conduct Authority's Climate Financial Risk Forum (CFRF). It is currently under development. The CFRF Scenario Analysis Working Group will update the tool periodically to enhance content, including to reflect future updates to NGFS scenarios. The information contained in this tool has been written by industry, for industry.

Climate Impact Explorer [15]

> This tool is from Climate Analytics in collaboration with the Network for Greening the Financial System, the Potsdam Institute for Climate Impact Research, and ETH Zürich. This tool shows how the severity of climate change impacts will increase over time in continents, countries, and provinces at different levels of warming, starting with 1.5°C, the limit in the Paris Agreement. It also allows access to the underlying data.

Any of these tools can be used to understand the inherent risk related to climate change that an organization faces.

STRESS TESTING

Stress tests are forward-looking exercises that aim to evaluate the impact of severe but plausible adverse scenarios on the resilience of financial firms. They involve the use of models and data at the firm or systemwide level and may rely on historical or hypothetical scenarios. [16]

There is a special form of stress test called a Reverse Stress Test. A Reverse Stress Test is a stress test that starts from the opposite end—with the identification of a pre-defined outcome. This might be the point at which an entity can be considered as failing, or the entity's business model becomes unviable. Severe, but plausible, scenarios that might result in this outcome are then explored. [17]

LIMITATIONS

As valuable as these tools are, there are limitations. As outlined in the FIS Connect paper: [18]

- While stress tests can be used to identify exposures to specific events and scenarios, they do not predict the probability of such events or scenarios occurring.
- Another limitation is the element of judgment required in choosing the scenarios and risks covered in the stress test.
- Finally, the value of a stress test rests heavily on the quality of the data and the modelling approaches adopted for the exercise.

So, when utilizing these tools, it would be wise to review the Applicability Guidelines for Actuarial Standards of Practice [19] to ensure that you have adequately approached the project from an actuarial perspective.

Now armed with the quantitative analysis, the next step within the ERM Framework is to determine how to address the exposures the organization faces.

Acceptance, Transference, Mitigation, and Avoidance—Addressing the Quantified Risks

RISK TOLERANCES AND RISK APPETITE

Risk appetite vs. risk tolerance: These two terms are often confused and even used interchangeably. While they both provide guidance for deciding how much risk to take on, risk appetite and risk tolerance are separate concepts that both play an important role in finding the balance between taking risk and controlling it. Knowing the distinction, how they interact, and how to put them to work can make sure you are taking the right amount of risk to accomplish your strategic goals. [20]

Think of risk appetite vs. risk tolerance as two sides of the same coin. Enterprise risk management expert and frequent Risk@Work webinar guest Rob Quail defines the terms this way:

Risk appetite is the amount of risk an organization is willing to take to achieve its objectives. Risk appetite is applied broadly and strategically.

Risk tolerance is the specific level of risk an organization deems acceptable within various categories of risk. Risk tolerance is applied operationally and tactically.

ORGANIZATION STRATEGY

With the Risk Appetite and Risk Tolerances established, then you can determine your strategy to address climate change through:

- Risk mitigation: Taking steps to lessen the severity of a potential negative outcome. Example: limiting exposure to a certain aggregate annual loss amount of $x million over a one in 250-year event.
- Risk transference: Transferring the responsibility for a risk to another entity, usually through insurance or contracts. Example: purchasing reinsurance.
- Risk acceptance: Choosing to not actively manage a risk, often because the potential impact is considered low, or the cost of mitigation is too high. Example: continuing without change to your underwriting or investment portfolio.
- Risk avoidance: Completely avoiding a potential risk by not engaging in the activity that poses it. Example: no longer writing accounts with a high carbon index.

The strategy must be organization specific and align with the objectives and values of the organization as outlined by the Board of Directors and Executive Management. With the strategy in hand, implementation, monitoring, and communication can now occur.

Risk Monitoring and Communication

The ERM function in conjunction with the Executive Team and all impacted areas must construct the metrics and measurements associated with climate change. There is a plethora of publications on development of risk metrics. Each organization must determine which fit best related to the established risk appetite and tolerances for climate change; but establishing the reports that monitor progress and awareness related to the strategy is key. The best means of fostering communication is having regular updates and discussions around those published reports. Active monitoring of goals and objectives is an extremely effective means of engagement and promoting understanding. Engagement and understanding lead to improvement in the process and the monitoring over time.

Summary

The goal of ERM is to understand all the risks an organization faces today and in the future which affects them either positively or negatively. Climate change is one of those risks and needs the proper consideration within the context of the organization's investments, products, operations, etc. Even though there may not be direct exposure to the portfolio from climate change, the indirect impacts can be just as damaging. ERM professionals need to review the exposure to determine its potential, and the timeframes needed to properly monitor the risk as it changes over time.

References

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[2] https://jelvix.com/blog/enterprise-risk-management#:~:text=What%20Does%20ERM%20Mean%3F,in%20case%20they%20do%20happen

[3] https://www.soa.org/resources/research-reports/2023/16th-survey-emerging-risks as summarized in Slide 16 of the presentation "Climate Change: Are We at Risk Yet?" on 12/7/2023 by Joan Barrett, Brian Hinkle, and Yi Yang

[4] Society of Actuaries Climate Risk Module 1.5.1 Definitions of Climate Change and Global Warming

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[6] rms.com/climate-change

[7] –Actuarial Standards of Practice No. 23, Revised Edition, Data Quality, December 2016

[8] Actuarial Standards of Practice No. 38, Using Models Outside the Actuary's Area of Expertise, June 2000

[9] https://www.ngfs.net/

[10] https://www.ipcc.ch/

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