MSCI ESG Ratings Methodology: Climate Change Vulnerability Key Issue

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Contents

Introduction

This document provides essential information on the components of the Climate Change Vulnerability Key Issue to enable users of ESG Ratings to understand how our outputs are determined. Climate Change Vulnerability is a Key Issue in the Environmental Pillar of the MSCI ESG Ratings model. Insurance companies are assessed on the physical risk that climate change may pose to insured assets or individuals.

For additional details on the MSCI ESG Ratings Model, refer to Section 2, Data, ratings and scores, of "ESG Ratings Methodology."

Exhibit 1: MSCI ESG Key Issue hierarchy

3 Pillars	10 Themes	33 ESG Key Issues
Environmental	Climate Change	Carbon Emissions
		Climate Change Vulnerability
		Financing Environmental Impact
		Product Carbon Footprint
	Natural Capital	Biodiversity & Land Use
		Raw Material Sourcing
		Water Stress
	Pollution & Waste	Electronic Waste
		Packaging Material & Waste
		Toxic Emissions & Waste
	Environmental Opportunities	Opportunities in Clean Tech
		Opportunities in Green Building
		Opportunities in Renewable Energy
Social	Human Capital	Health & Safety
		Human Capital Development
		Labor Management
		Supply Chain Labor Standards
	Product Liability	Chemical Safety
		Consumer Financial Protection
		Privacy & Data Security
		Product Safety & Quality
		Responsible Investment
	Stakeholder Opposition	Community Relations
		Controversial Sourcing
	Social Opportunities	Access to Finance
		Access to Health Care
		Opportunities in Nutrition & Health
Governance	Corporate Governance	Board
		Pay

3 Pillars	10 Themes	33 ESG Key Issues
		Ownership & Control
		Accounting
	Corporate Behavior	Business Ethics
		Tax Transparency

Risks associated with this Key Issue

- Model risk: incorrect model specifications affect balance sheet and income statement assumptions.
- Timing and size of claims impact cash flows, solvency.
- Catastrophic risk: more frequent and less predictable catastrophic losses.
- Reinsurance risk: increase in large-scale or concurrent events can affect solvency of reinsurers, leading to counterparty risk.

Climate Change Vulnerability Key Issue Score

The Climate Change Vulnerability Key Issue Score evaluates the company's level of exposure to, and management of risks on this Key Issue. The Key Issue Score is based on the Exposure Score and the Management Score using the formula below. The Exposure Score and the Management Score are combined such that a higher level of exposure requires a higher level of demonstrated management capability in order to achieve the same overall Key Issue Score.

$$KI_i = 7 - (\max(EXP_i, 2) - MGMT_i)$$

Where:

- KI_i is the Key Issue Score for company i.
- EXP_i is the Exposure Score for company i.
- $MGMT_i$is the Management Score for company i.

Climate Change Vulnerability Management Score

The Climate Change Vulnerability Management Score evaluates the company's ability to manage its exposure to risks on this Key Issue. It is based on an average of the scores associated with each of the Management Score categories listed below. These scores are derived from data points that are scored on a 0-10 scale, with 10 corresponding to best practice and 0 corresponding to lack of management. Refer to Section 3.3, Analyzing risk management, of "ESG Ratings Methodology" for additional details. Sources are company disclosures except where otherwise indicated. The following formula is used to calculate the Climate Change Vulnerability Management Score

$$MGMT_{CCV,i} = \frac{URM_{CCV,i} + PERF_{CCV,i}}{2}$$

Where:

- $MGMT_{CCV,i}$ is the Climate Change Vulnerability Management Score for company i.
- $URM_{CCV,\,i}$ is the Underwriting Risk Management Score for company i.
- $PERF_{CCV,i}$ is the Performance Score for company i.

The following data points, without constituting an exhaustive list, are representative of the inputs to the Management Score and are used in the Management Score calculation:

Management Score category: Underwriting Risk Management Score

- **Recognition that physical risk of climate change may increase underwriting risks.**

  Definition: Indicates whether the company recognizes that the physical risk of climate change may increase underwriting risks. Applicable to the insurance industry only.

- **Research or exercise to quantify the impact of physical risk on insurance underwriting.**

  Definition: Indicates whether the company conducts research or exercises to quantify the impact of physical risk on insurance underwriting, either directly (via primary research) or indirectly (through an industry consortium). Applicable to the insurance industry only.

- **Evidence of using climate change models.**

  Definition: Indicates whether the company uses statistical or mathematical models to model climate change effects in actuarial assessments. Applicable to the insurance industry only.

Management Score category: Performance Score

''**Representative performance metrics**:

- 'Underwriting performance compared to peers, based on the company's combined ratio.
- Underwriting performance compared to peers, based on the company's loss ratio.
- Other climate change vulnerability metrics.

Climate Change Vulnerability Exposure Score

The Climate Change Vulnerability Exposure Score evaluates the company's exposure to risks on this Key Issue. It is based on the average of the Business and Company-Specific Exposure Scores, combined with the Geographic Exposure Score. The Geographic Exposure Score functions as a multiplier on the averaged Business and Company-Specific Exposure Scores, with an impact ranging from -50% to +50%. The Business Exposure Score, Geographic Exposure Score and Company-Specific Exposure Score are scored on a 0-10 scale, with 10 corresponding to the highest risk and 0 corresponding to the lowest risk. Refer to Section 3.2, Analyzing risk exposure, of "ESG Ratings Methodology" for additional details. The following formula is used in the Exposure Score calculation:

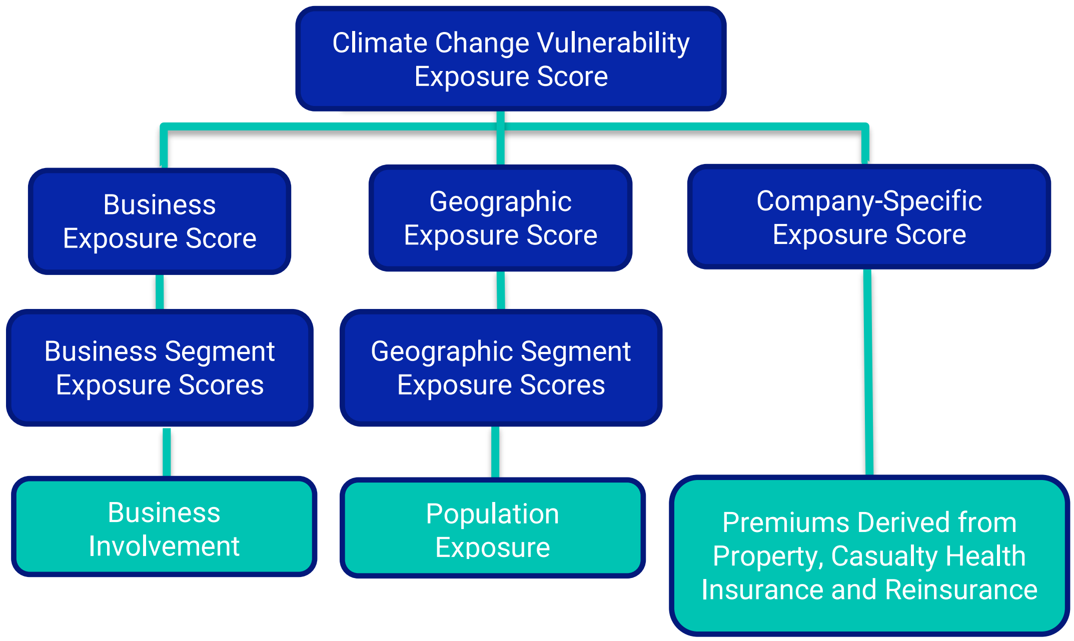
$$EXP_{CCV,i} = \left(\frac{BUS_{CCV,i} + COMSS_{CCV,i}}{2}\right)\left(1 + 0.1\left(GEO_{CCV,i} - 5\right)\right)$$

Where:

- $EXP_{CCV,i}$ is the Climate Change Vulnerability Exposure Score of company i.
- $BUS_{CCV,i}$ is the Business Exposure Score of company i.

- $COM_{CCV,i}$ is the Company-Specific Exposure Score of company i.
- $GEO_{CCV,i}$ is the Geographic Exposure Score of company i.

Exhibit 2: Exposure Score components



Business Exposure Score

The Business Exposure Score is a weighted average of the Business Segment Exposure Scores of a company's business segments. Scores are weighted by the proportion of a company's total revenue in each business segment, using the following formula to calculate the Business Exposure Score:

$$BUS_{CCV,i} = \sum_{j=1}^{n_i} w_{Revenue,i,j} BSE_{CCV,j}$$

Where:

- $BSE_{CCV,j}$ is the Business Segment Exposure Score for business segment j.
- $w_{Revenue,i,j}$ is the weight of business segment j for company i based on the contribution to total company revenue.
- n_i is the number of business segments of company i.

Business Segment Exposure Scores

The Business Segment Exposure Score of a business segment is based on a mapping of the business segment as disclosed by the company to a corresponding business activity. MSCI ESG Research uses the Standard Industrial Classification (SIC) system along with industry-specific adjustments to define business activities. The score associated with a business activity is used to calculate a Business Segment Exposure Score. Each business activity score is determined by a qualitative assessment of whether a business activity has a core involvement in insuring property, assets and individuals for both primary insurance and reinsurance. A higher involvement will result in a higher Business Segment Exposure Score for the business activity.

Geographic Exposure Score

The Geographic Exposure Score is the weighted average of the Geographic Segment Exposure Scores of the countries and regions in which a company operates. Scores are weighted by the proportion of a company's total revenue in each geographic segment using the following equation:

$$GEO_{CCV,i} = \sum\nolimits_{l=1}^{n_i} w_{Revenue,i,r} GSE_{CCV,r}$$

Where:

- $GSE_{CCV,r}$ is the Geographic Segment Exposure Score in region r.
- $w_{Revenue,i,r}$ is the weight of total revenue in region r for company i.
- n_i is the number of geographic segments for company i.

For geographic segments reported as regions (example: Asia Pacific), a nominal GDP-weighted country aggregation is used to calculate region-level scores, using the following equation:

$$GSE_{CCV,r} = \sum\nolimits_{c=1}^{n_r} w_{GDP,r,c} GSE_{CCV,c}$$

Where:

- $GSE_{CCV,c}$ is the Geographic Segment Exposure Score of country c.

- $w_{GDP,r,c}$ is the specific weight of country c within region r.

Geographic Segment Exposure Scores

The Geographic Segment Exposure Score of a geographic segment is determined by selecting the maximum population exposure to any natural hazard, including climate-induced natural hazards, as per the INFORM Risk Index:

$$GSE_{CCV,r} = \max\left(HPE_{k,r}\right)$$

Where:

- $GSE_{CC,r}$ is the Geographic Segment Exposure Score for region r.
- $HPE_{k,r}$ is the Hazard Population Exposure Score to natural hazard k in region r.

The Hazard Population Exposure Score is derived from the INFORM Risk Index, which uses estimated population exposure to each natural hazard per country. These hazards include earthquakes, floods, tropical cyclones, droughts, tsunamis and epidemics.

Company-Specific Exposure Score

The Company-Specific Exposure Score is determined by a simple average of the Property & Casualty Insurance Line Score and the Reinsurance Line Score:

$$COM_{CCV,i} = \frac{P\&C_i + ReINS_i}{2}$$

Where:

- $COM_{CCV,i}$ is the Company-Specific Exposure Score for company i.
- $P\&C_i$ is the Property and Casualty Insurance Line Score for company i.
- $ReINS_i$ is the Reinsurance Line Score for company i.

The Property and Casualty Insurance Line Score is calculated from the percentage of premiums derived from property and casualty insurance lines. The Reinsurance Line Score is calculated from the percentage of premiums derived from reinsurance lines.

Data Sources

The following sources are used to determine the Climate Change Vulnerability Exposure Score:

INFORM Risk Index, Inter-Agency Standing Committee and European Commission; Refinitiv; MSCI ESG Research; company disclosures.

Model Update History

- In April 2023, the INFORM Risk Index was added to the Geographic Exposure Score calculation.

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