CLIMATE SCIENCE INSIGHT

WHEN CLIMATE SHOCKS BECOME SYSTEMIC FINANCIAL RISKS

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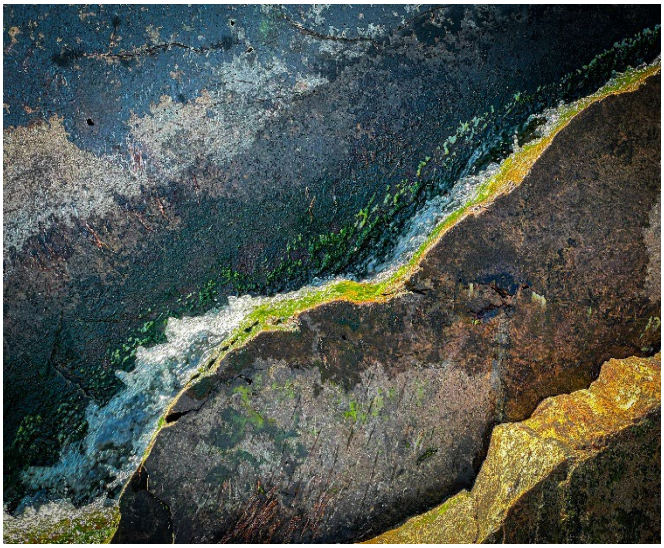
ABOUT US

ACCR is a not-for-profit, philanthropically funded shareholder advocacy and research organisation.

We focus on protecting long-term portfolio value while mitigating systemic and physical climate risks. Using our expertise in shareholder strategy, we enable investors to engage and escalate with major heavy-emitting listed companies, and influence change at sector and value-chain levels. Our research team combines finance, investment, industry, and climate science expertise to deliver actionable insights to institutional capital.



CLIMATE SCIENCE INSIGHT: WHEN CLIMATE SHOCKS BECOME SYSTEMIC FINANCIAL RISKS

What happens when climate shocks cascade through economic and financial systems?

Physical climate risks are no longer hypothetical. Extreme heat, drought, storms and floods are already affecting assets, supply chains and communities.

However, many climate risk assessments still treat these climate events in isolation, evaluating impacts on individual companies, sectors or regions. This approach risks underestimating the most disruptive form of climate risk: systemic risk driven by cascading climate shocks.

From a climate science perspective, planning for systemic risks is crucial. Complex systems rarely fail in neat, linear ways. Instead, shocks propagate across them, amplifying impacts far beyond the initial climate event. As climate extremes become more intense and more frequent, these cascading effects become increasingly likely.

From physical shocks to financial instability

Climate impacts do not stop at the point of physical damage. A single extreme event can trigger a sequence of secondary effects that can then spread across the economy. Consider an extreme heatwave combined with drought. Agricultural yields fall sharply, driving food price inflation. Higher food prices exacerbate social and political instability, especially in vulnerable regions. Insurance losses escalate, leading insurers to withdraw coverage or re-price aggressively. Asset values re-price abruptly as risks that were once considered remote become unavoidable.

> “ This is the nature of climate financial cascades: physical shocks trigger economic stress, which in turn drives financial instability.

Importantly, these are not slow, incremental impacts. They are often rapid and compounding, affecting multiple asset classes and geographies simultaneously.

Why traditional climate risk analysis falls short

Much of today’s climate risk analysis is still grounded in a relatively narrow risk framework. Analysis tends to focus on direct physical damage to assets, sector-specific exposure, or damage functions that assume gradual, smooth and predictable changes over time.

These approaches struggle to capture three features of real-world climate risk.

1. Compound events. Multiple hazards can coincide or occur in quick succession, pushing systems beyond their design limits. A heatwave followed by drought and wildfire can be far more damaging than any one event alone.
2. Feedback loops. Climate impacts can amplify existing economic and financial vulnerabilities. Rising insurance losses reduce coverage availability, increasing exposure to future shocks, which in turn drives further losses.

3. **Threshold effects**. Systems often absorb stress up to a point, then fail abruptly. Once critical thresholds within a system are crossed, recovery may be slow or impossible within investment timeframes.

Systemic climate risks are now on the radar

The threat climate change poses to financial stability is no longer theoretical.

Climate scientists are researching the importance of cascading risks. A growing body of research shows that climate impacts cascade through critical systems, including energy, food, water, transport and finance. Disruption in one system increases the vulnerability of others.

Central banks and financial regulators are also increasingly recognising that climate risk is not just an environmental issue, but a macro-financial one. And now the Network for Greening the Financial System is exploring systemic climate scenarios that explicitly incorporate spillovers across sectors and borders.

What remains underdeveloped is investor understanding of how these dynamics translate into portfolio-level risk.

Why this matters for investors

Investors tend to be comfortable analysing firm-specific risks. Climate-driven systemic risks will always be harder to understand, model and price as they involve interconnected exposures, correlated losses, feedback loops and sudden regime shifts.

These shared system dependencies and interconnections undermine the possibility of diversification, but can't be ignored until they materialise. Climate-financial cascading risks include:

- Insurance market retreat from high-risk regions, leaving assets effectively uninsurable
- Infrastructure failures across power, water or transport systems that disrupt multiple sectors
- Commodity price spikes from simultaneous crop failures across key producing regions

Asking better questions about climate risk

The greatest financial risks from climate change may not come from damaged assets, but from destabilised systems. We need to ask: what happens if multiple adverse events occur at once?

As climate extremes intensify, the probability of cascading failures will rise. Investors who fail to incorporate this perspective risk being blindsided by shocks that cannot be understood through asset-by-asset analysis alone.

Understanding systemic climate risk does not require precise prediction of the next crisis. It requires recognising that the tail risks matter, interconnections amplify risk, and resilience depends on system-level robustness.

Useful questions to ask now include:

- Where are the critical nodes in the system?
- Which exposures are likely to amplify shocks rather than absorb them?
- Where do portfolio companies sit within climate-sensitive systems, such as energy, food or water, rather than as standalone entities?
- At what point could repeated climate shocks trigger abrupt financial repricing?