

Integrated Risk Analytics: A Proposed Framework for Measuring and Connecting Risks

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Research
Moody's Analytics

Agenda

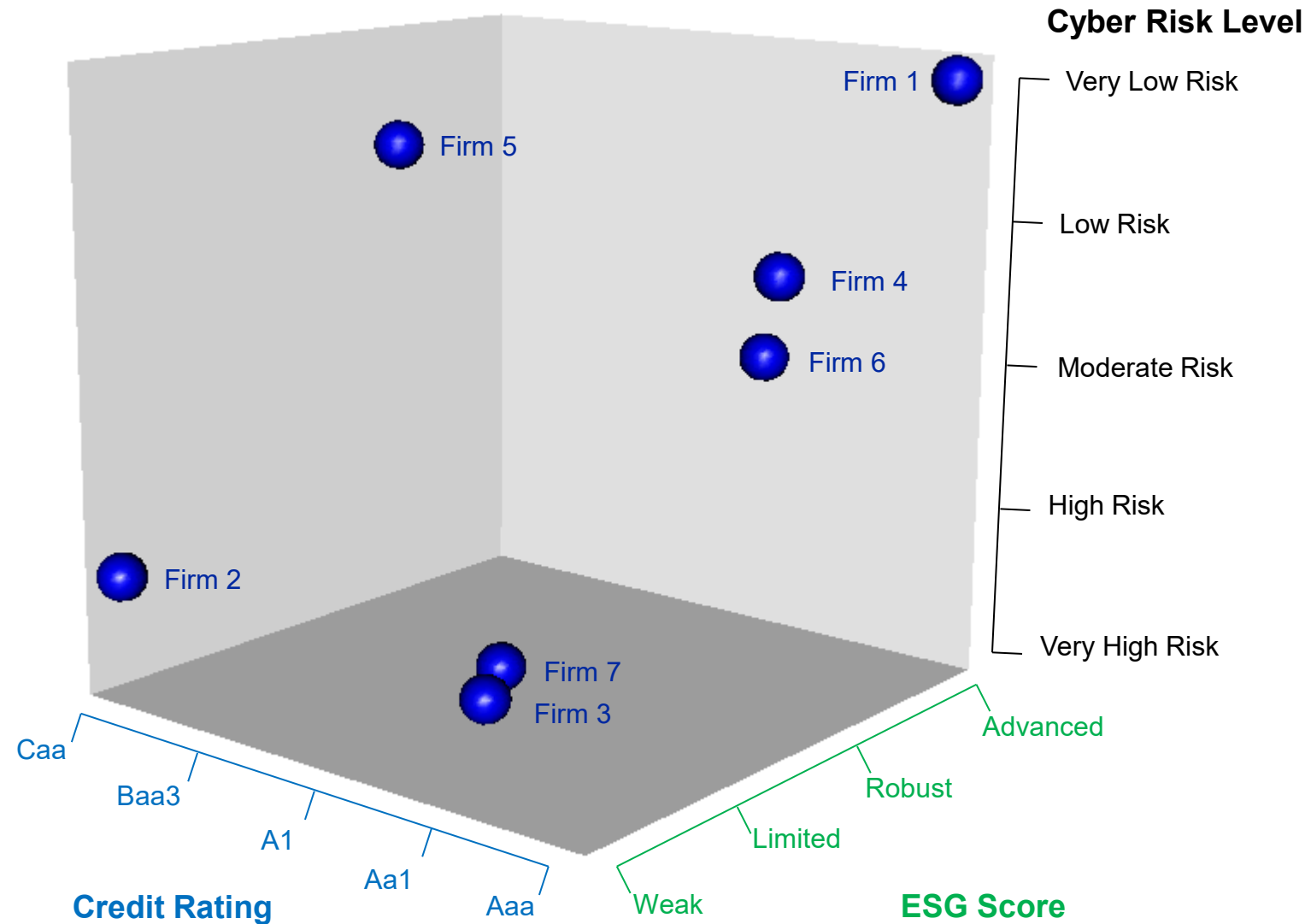
1. Framework: Integrated Risk Analytics
2. Analytics in Action: Identifying Risks and Opportunities

What risks do you worry *most* about today?

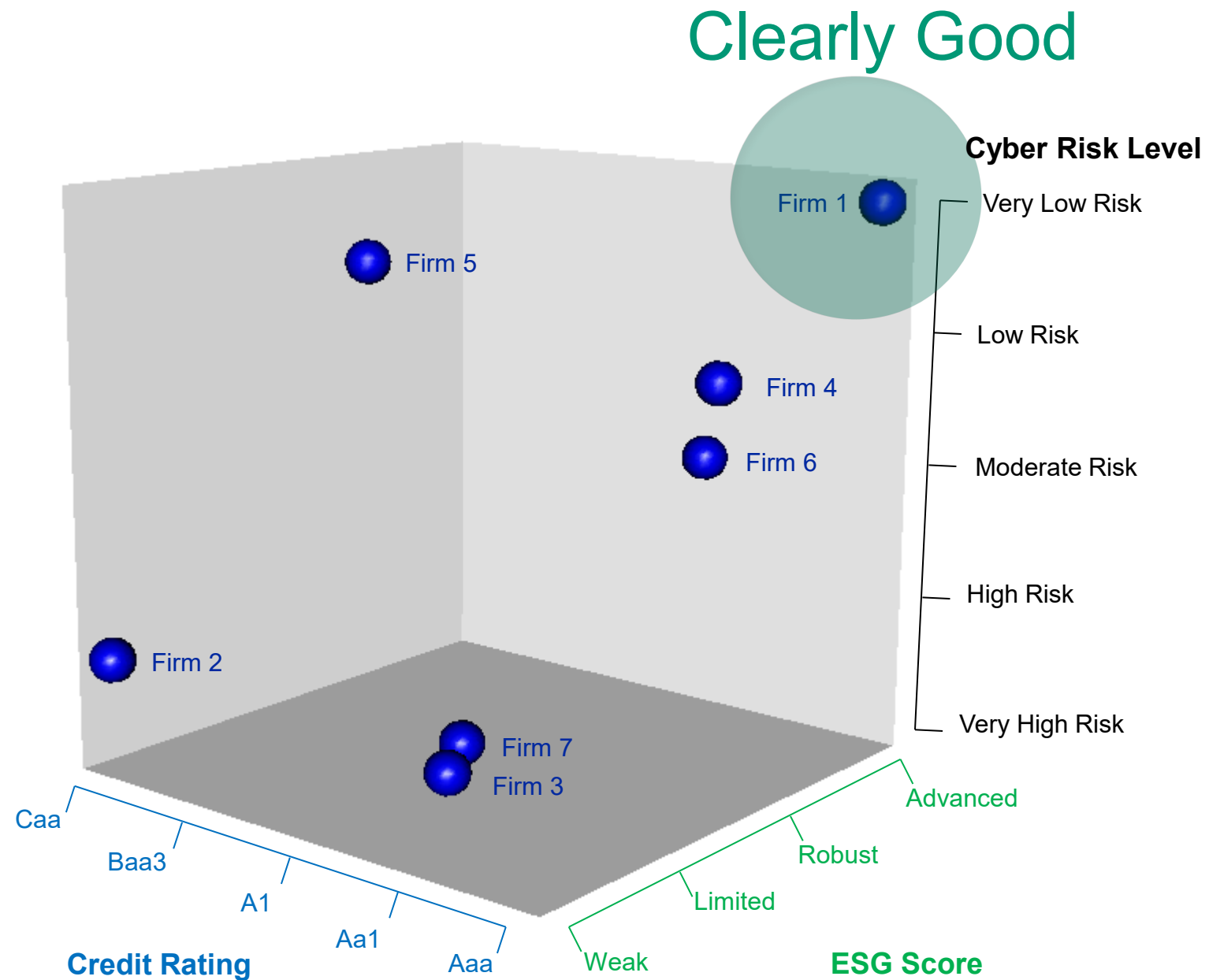
- A. Credit (fundamental, market & news signals)
- B. Macroeconomic (probability of a recession, interest rate, monetary and fiscal policy)
- C. Climate change (transition and physical)
- D. ESG (controversies, environmental targets, governance, social)
- E. Cyber (events, policies, security, insurance)
- F. Supply Chain (concentration, supplier disruptions)
- G. Geopolitical conflicts (Asian territorial disputes, Russia-Ukraine war, politics between the US and China)
- H. All of the above
- I. Other risks not listed

*In this simple
example with 3
risks...*

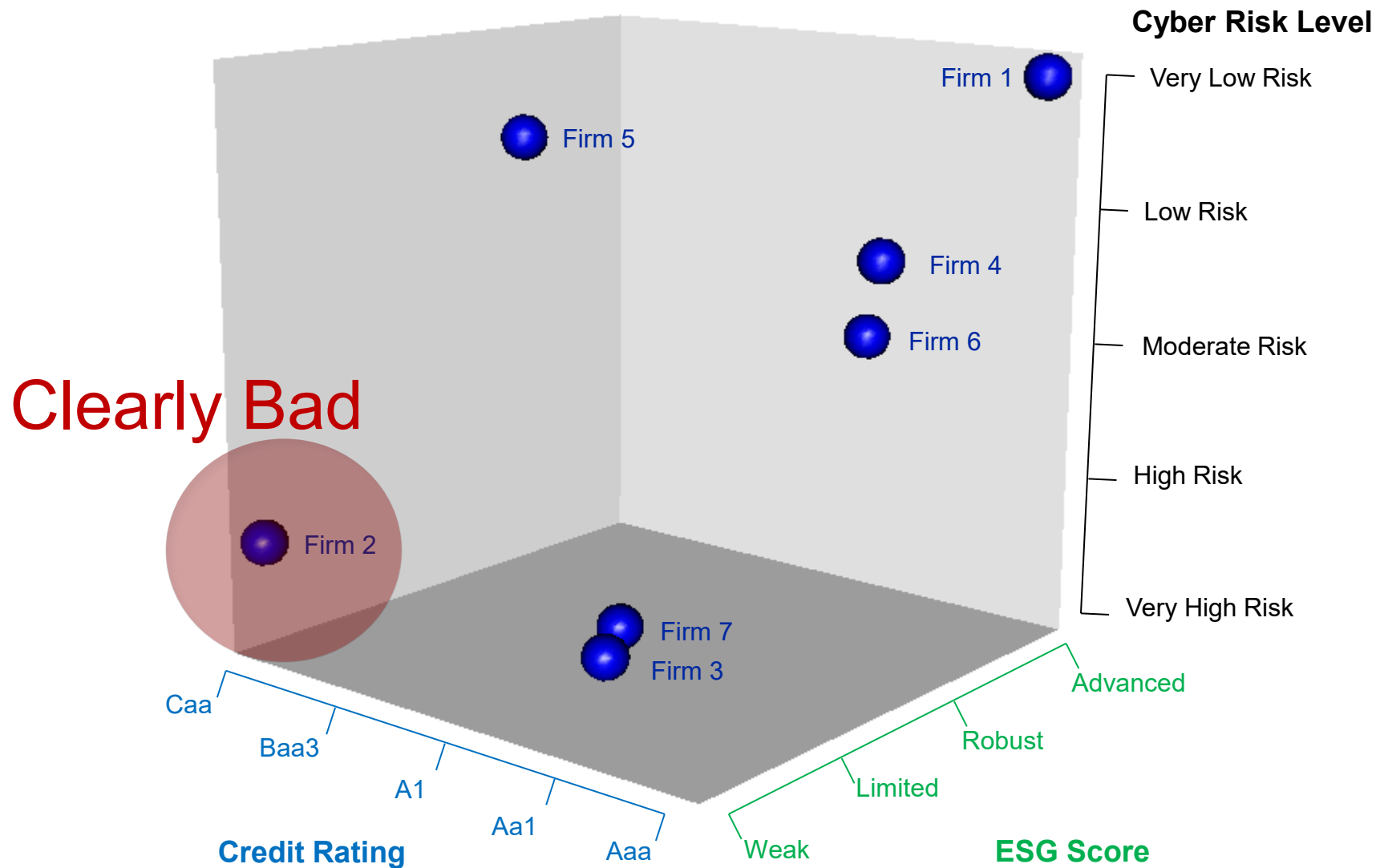
**Can we spot
the most
resilient firms?**



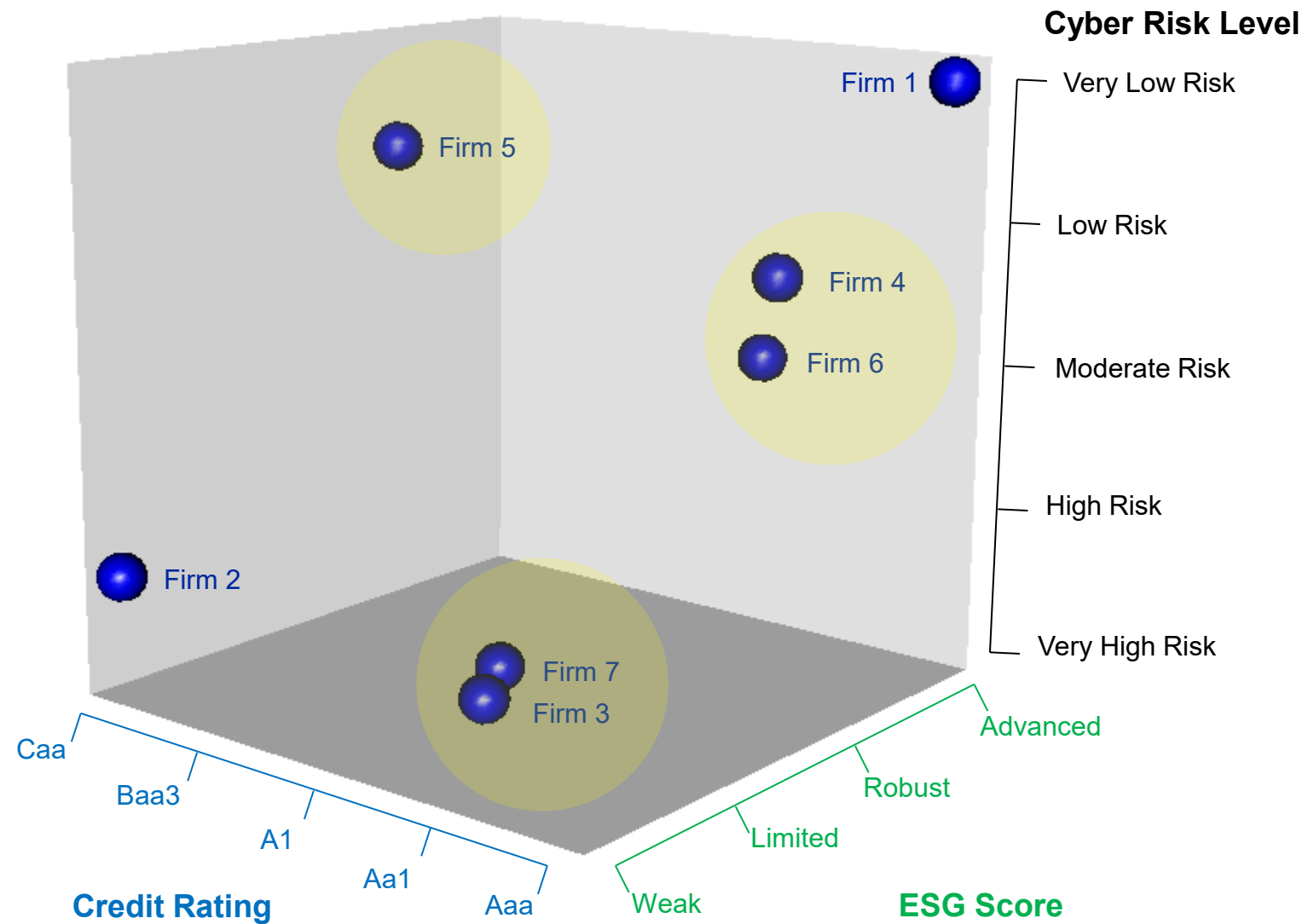
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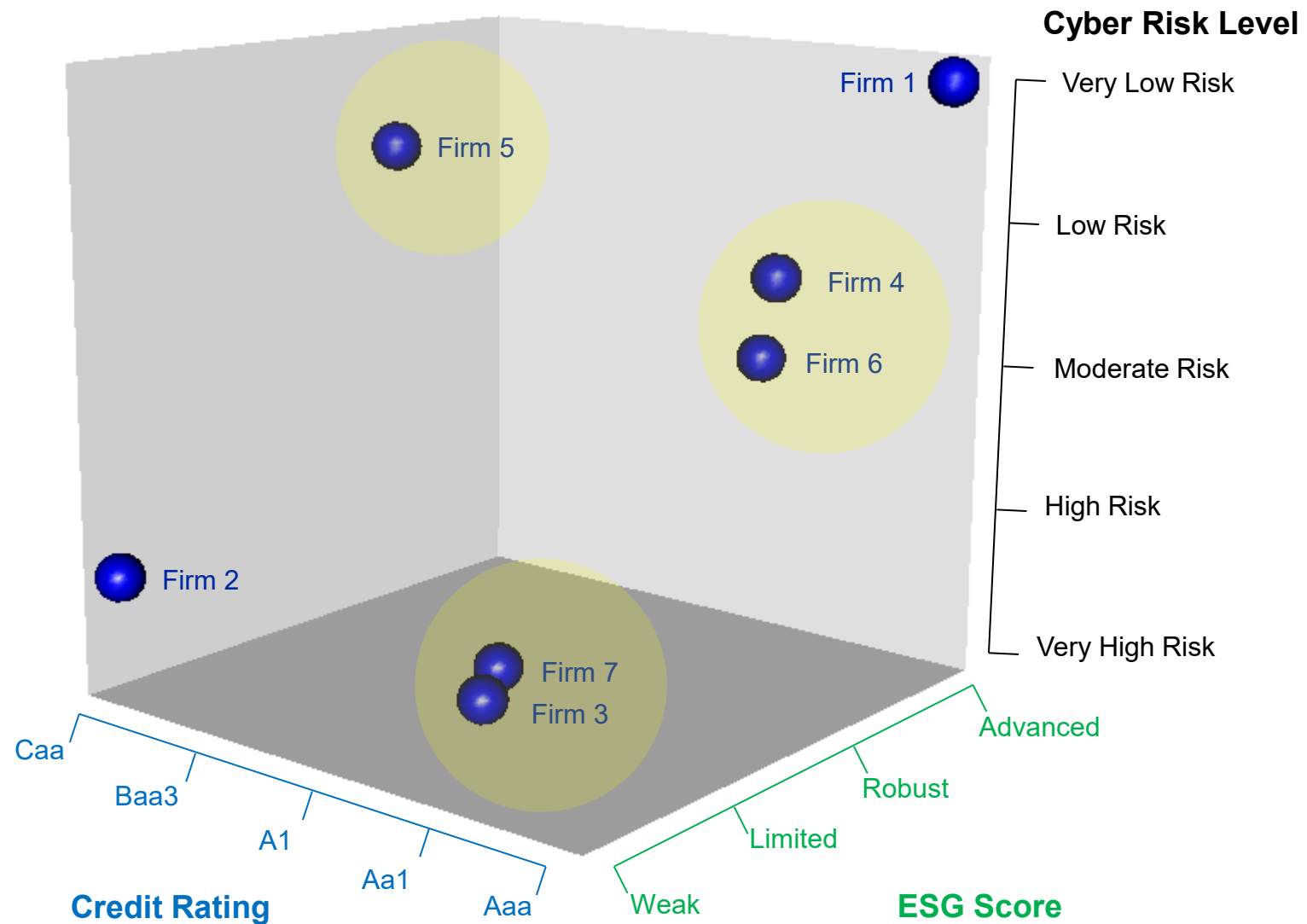
Can we spot
the riskiest
companies?



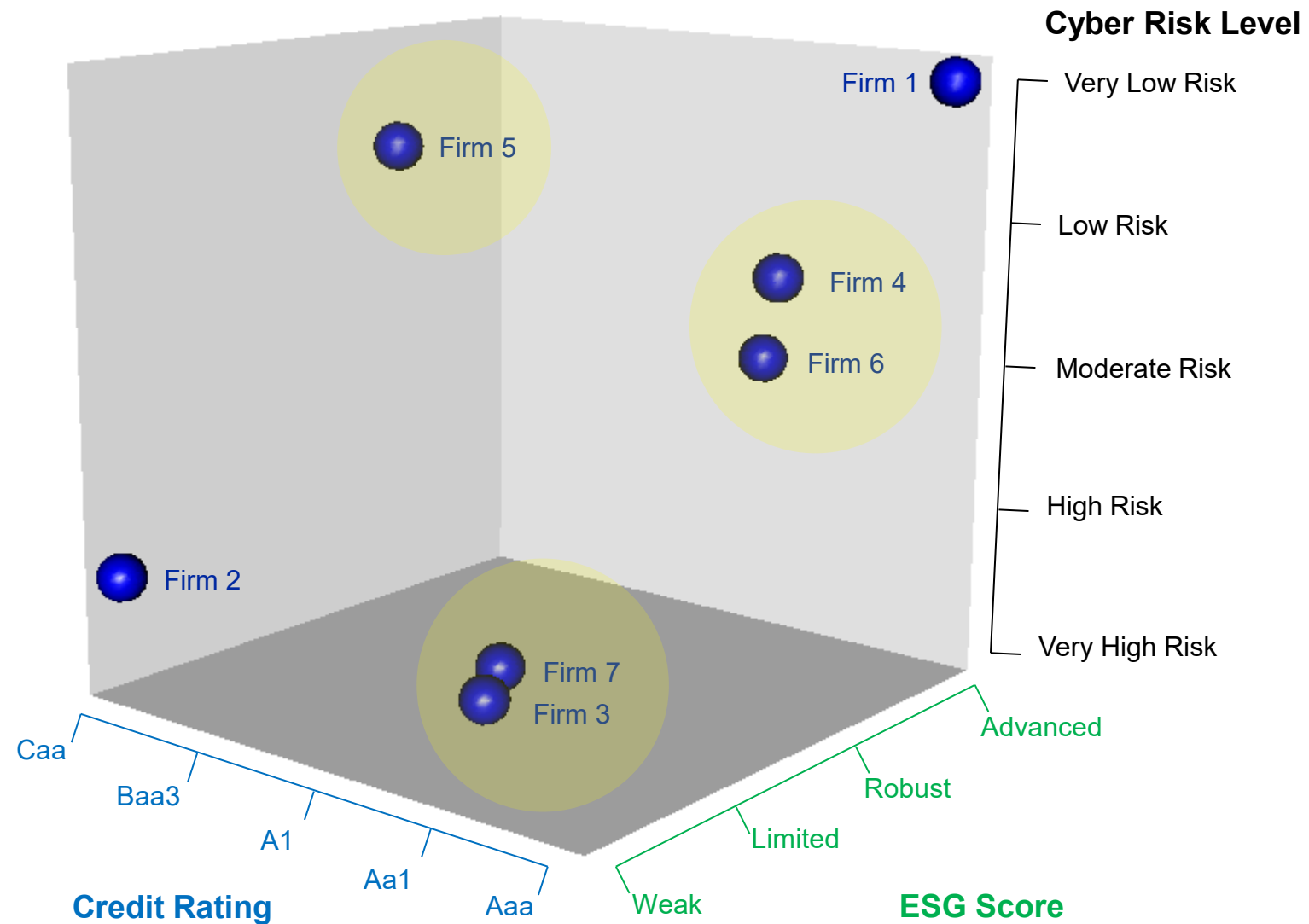
What about the rest of firms?



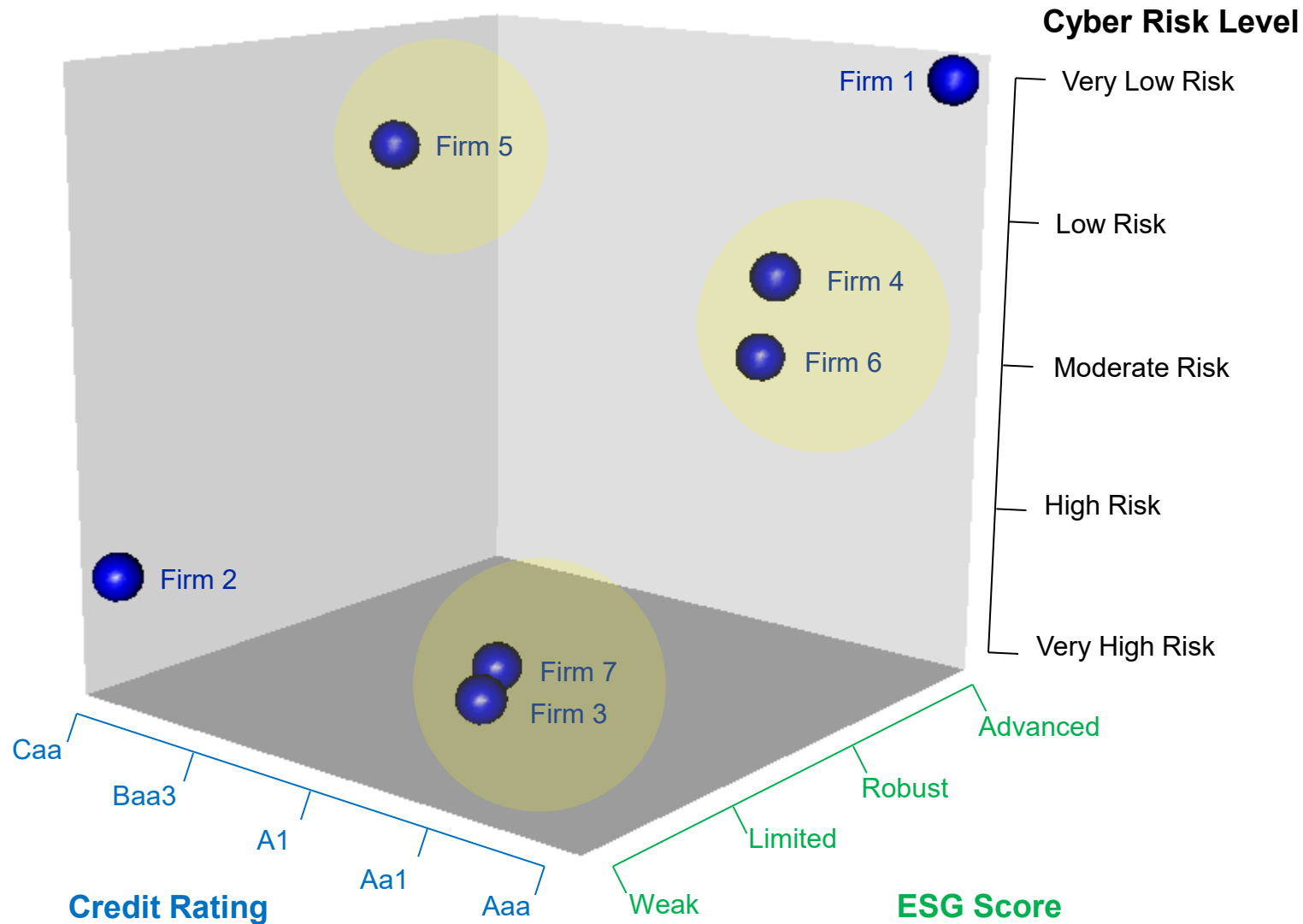
Which risks
should we be
most worried
about?



When should we start or stop worrying?



Many questions remain ...

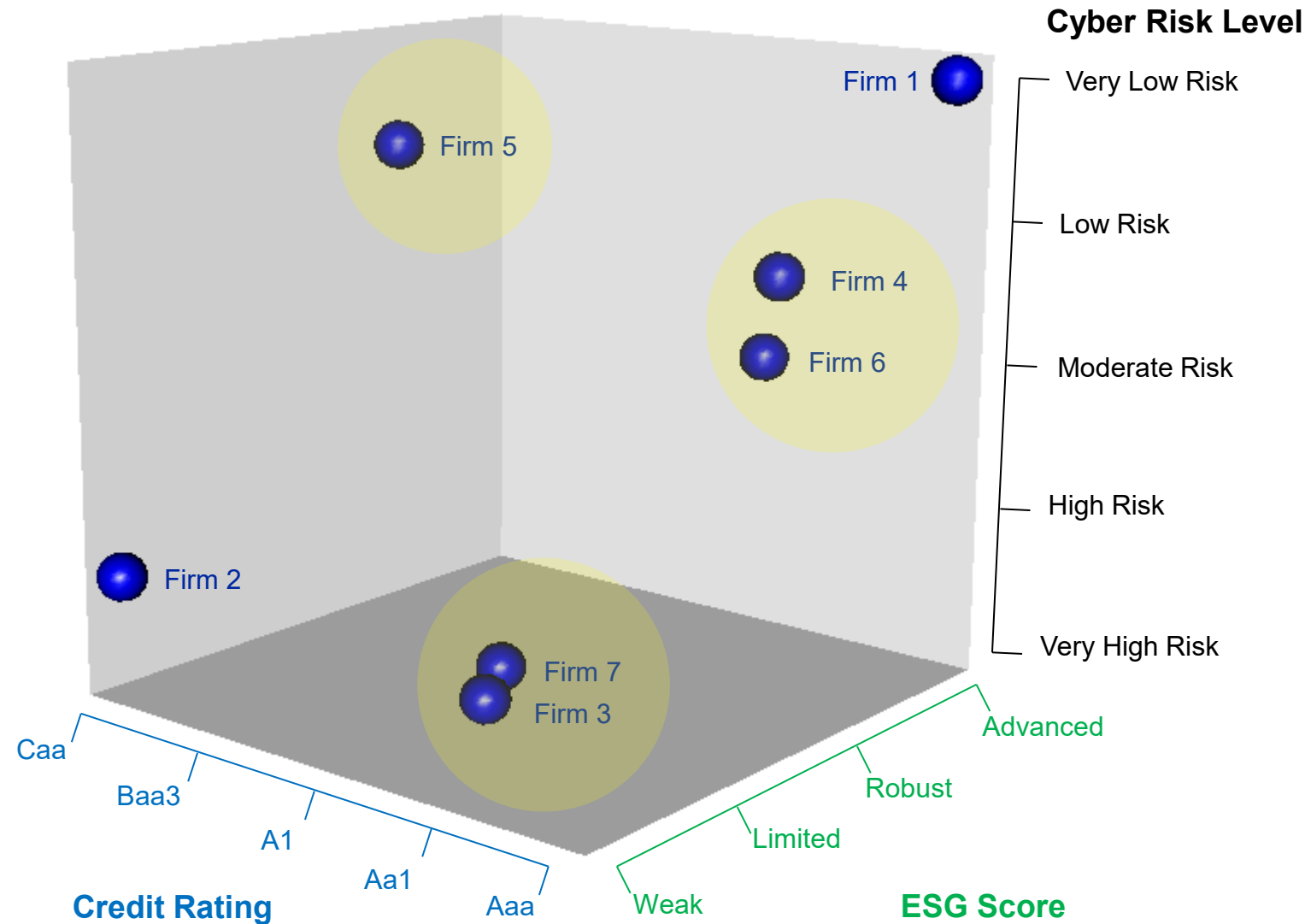


Many questions remain including ...

Are there more risks?

How to deal with

- **risk interconnection**
- **heterogenous scales and time horizon**
- **tail risk?**



1

Framework:
Integrated Risk Analytics

A Holistic Risk Framework

Analytics to connect interrelated risks with consistent scenario foundation

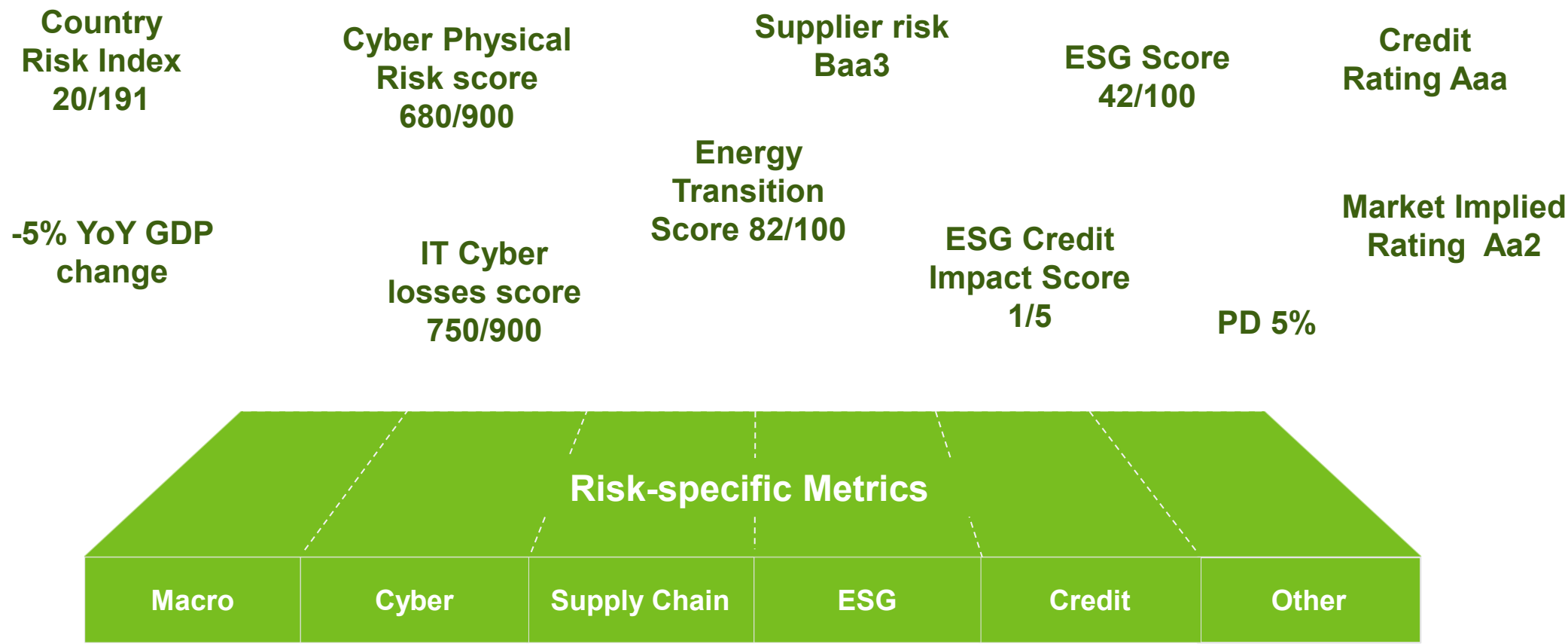
A Holistic Risk Framework

Analytics to connect interrelated risks with consistent scenario foundation



A Holistic Risk Framework

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A Holistic Risk Framework

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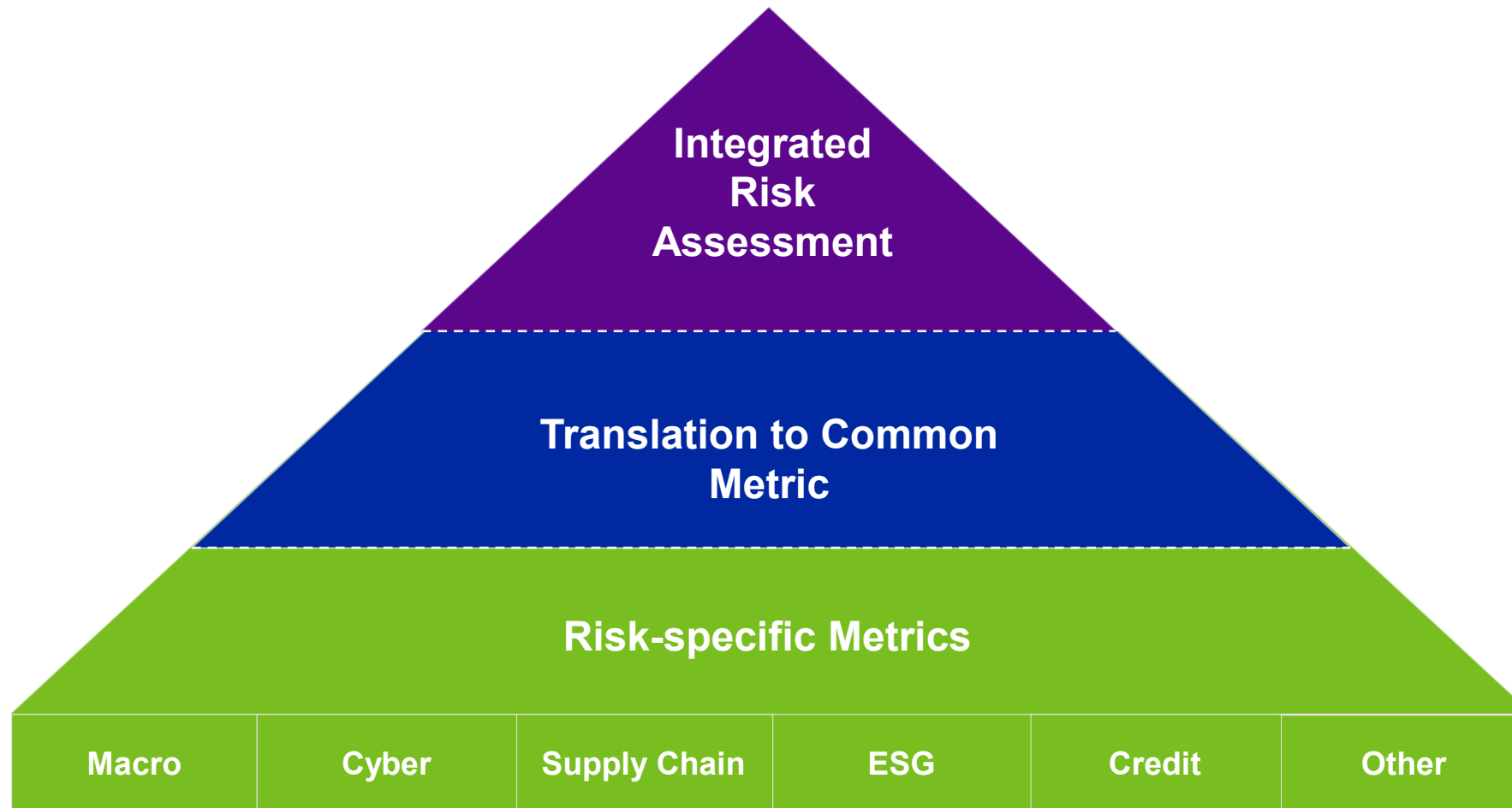
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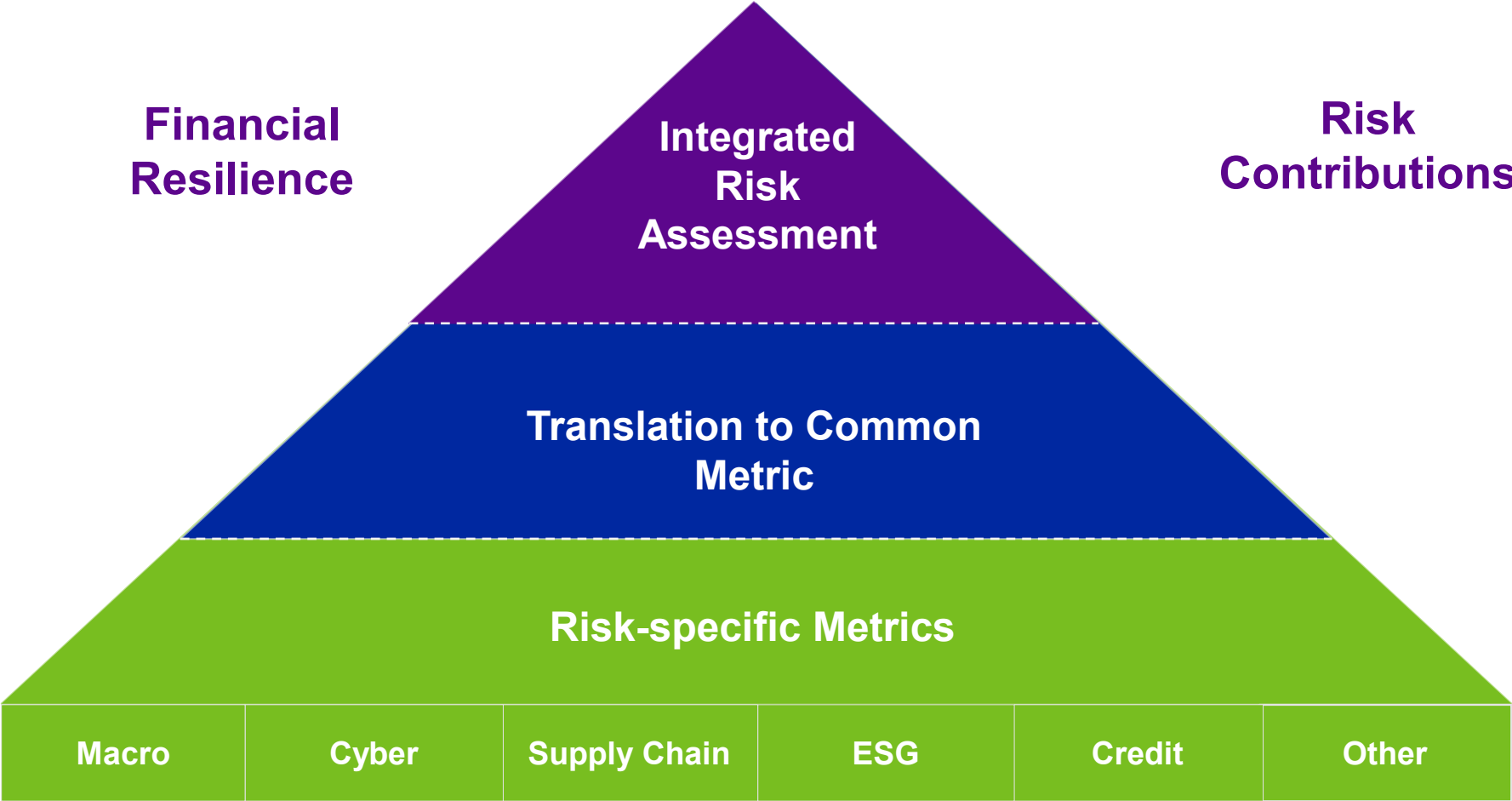
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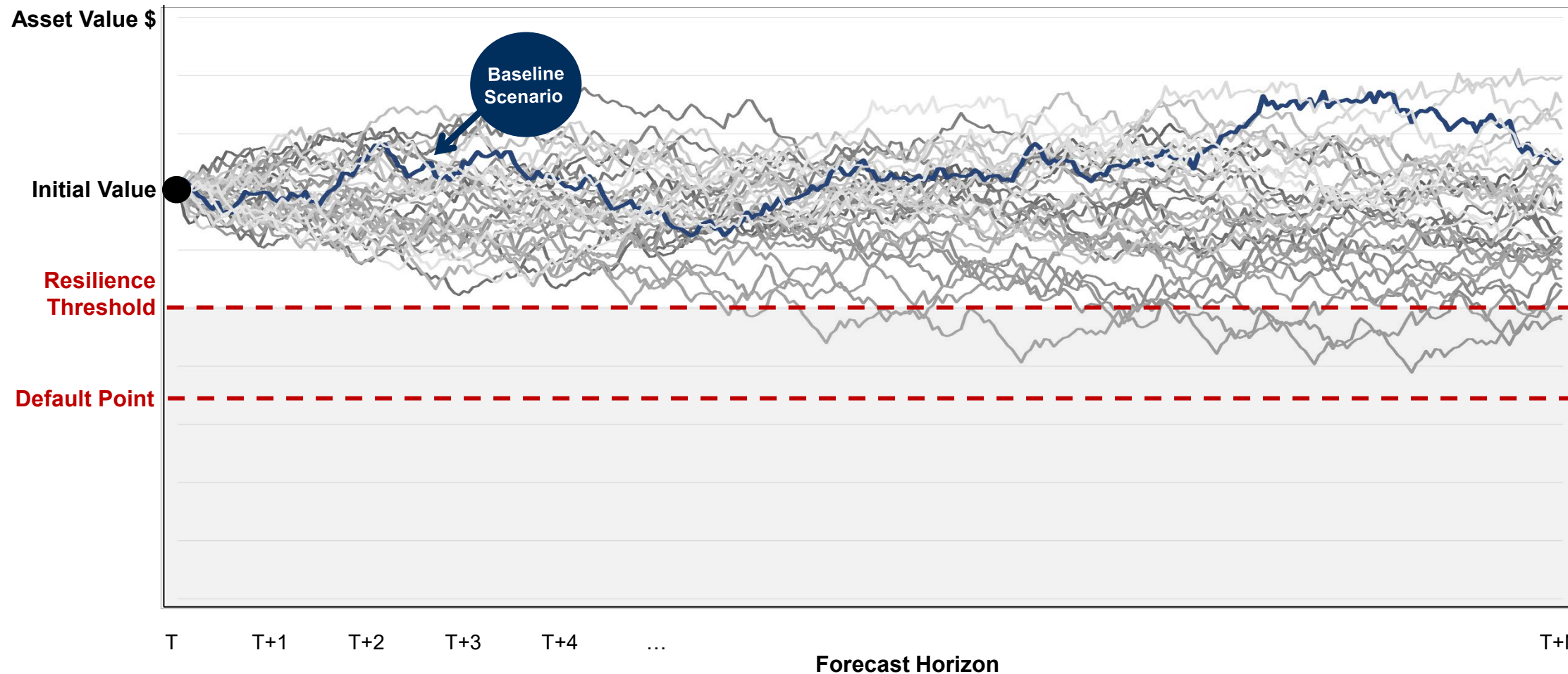
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Analytics to connect interrelated risks with consistent scenario foundation



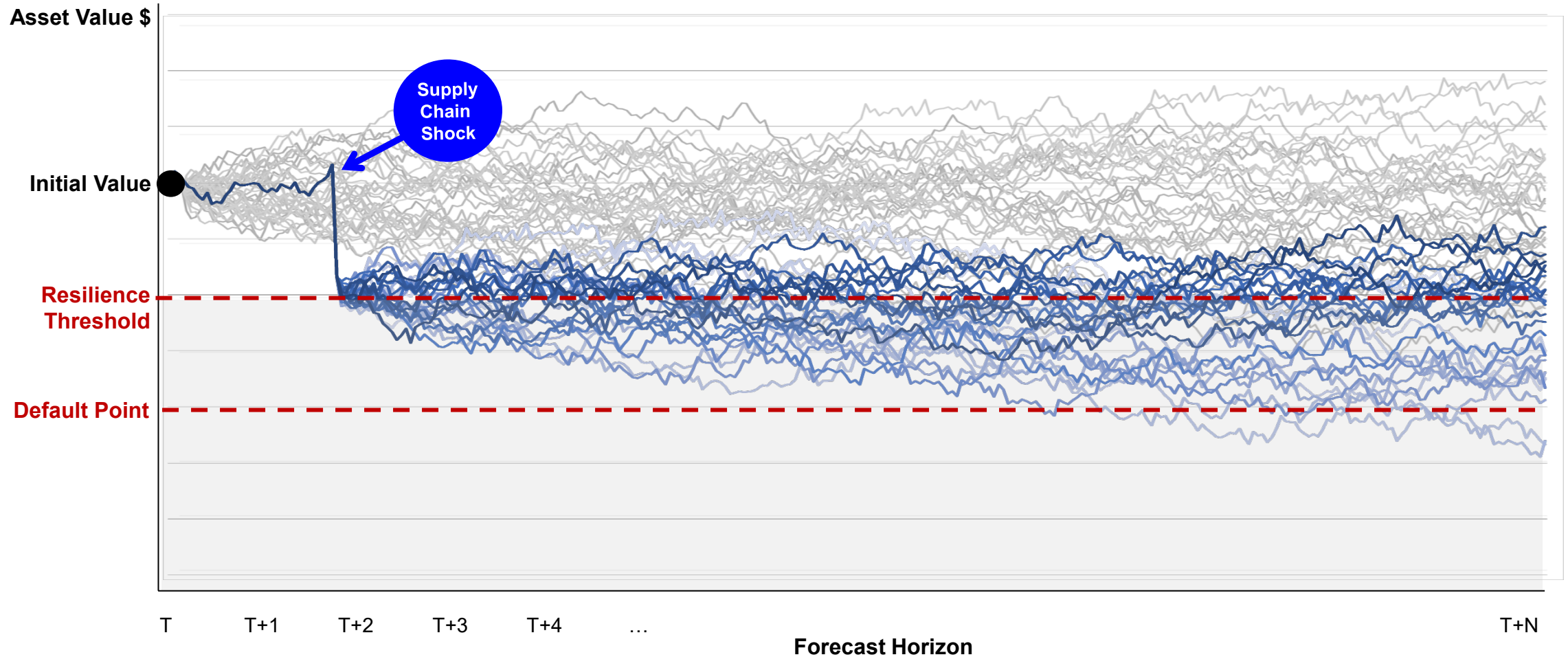
Systemic Risk Scenario Foundation

Different scenarios paths to understand future uncertainty



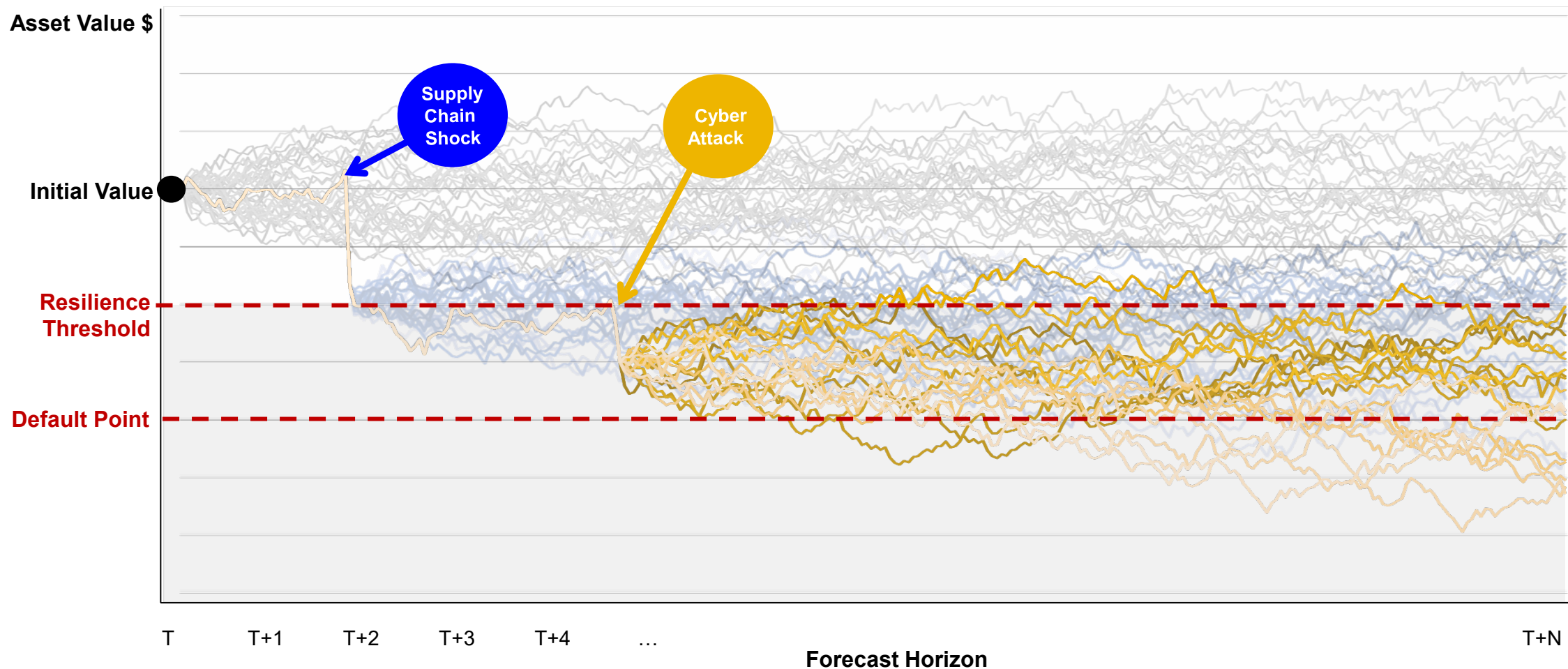
Adding Idiosyncratic Shocks

Different scenarios paths to understand future uncertainty



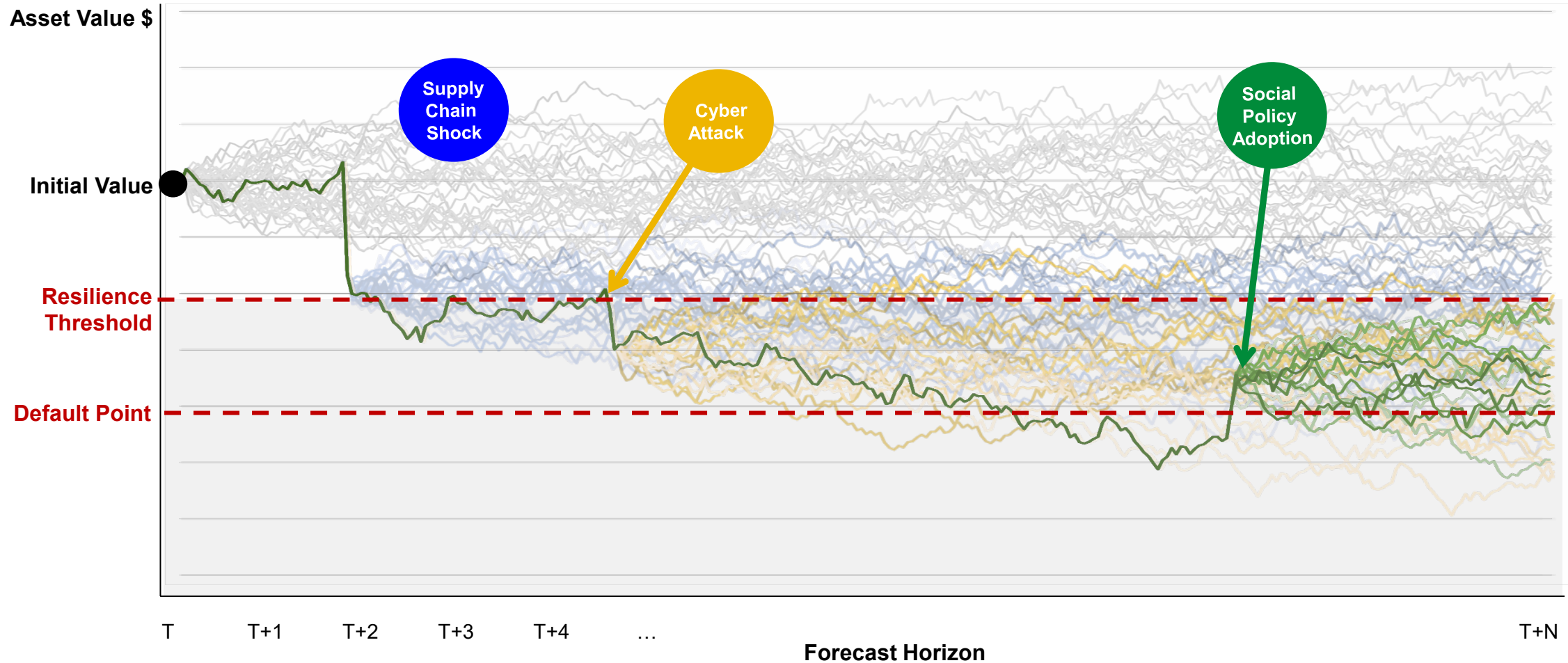
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Adding Idiosyncratic Shocks

Different scenarios paths to understand future uncertainty

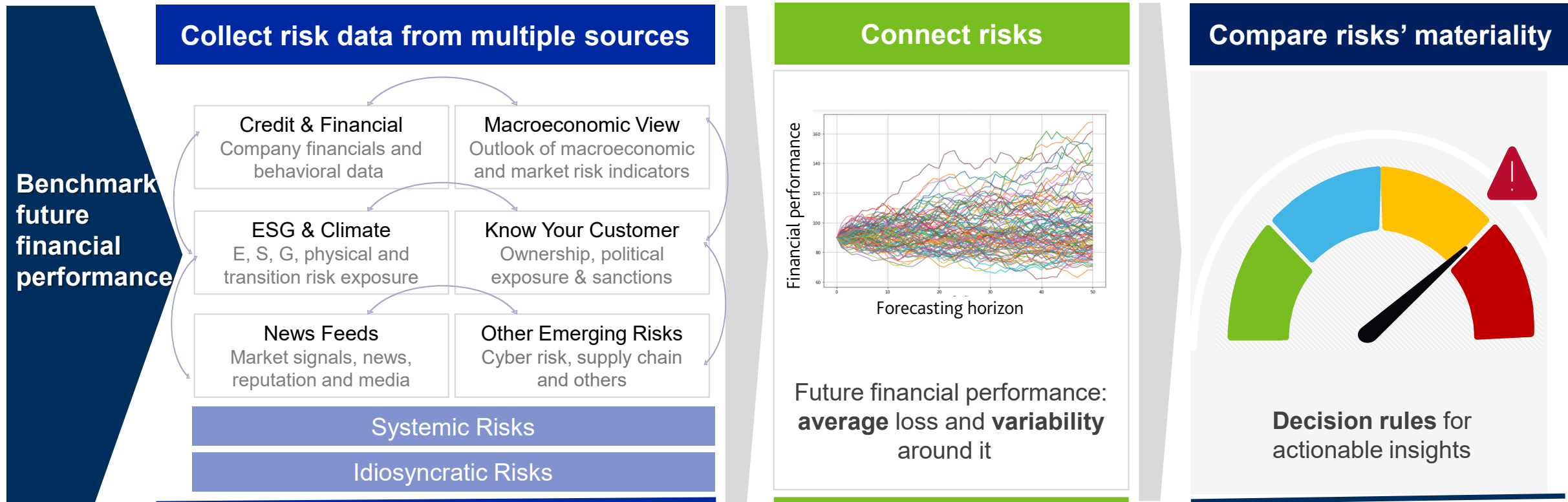


2

Analytics in Action:
Identify Risks and Opportunities

Managing Risks Holistically

Quantify the combined effect of various risk types to build resiliency



Which Risks Should I Worry About More and Why?

Accurate risk-specific measures alone cannot help

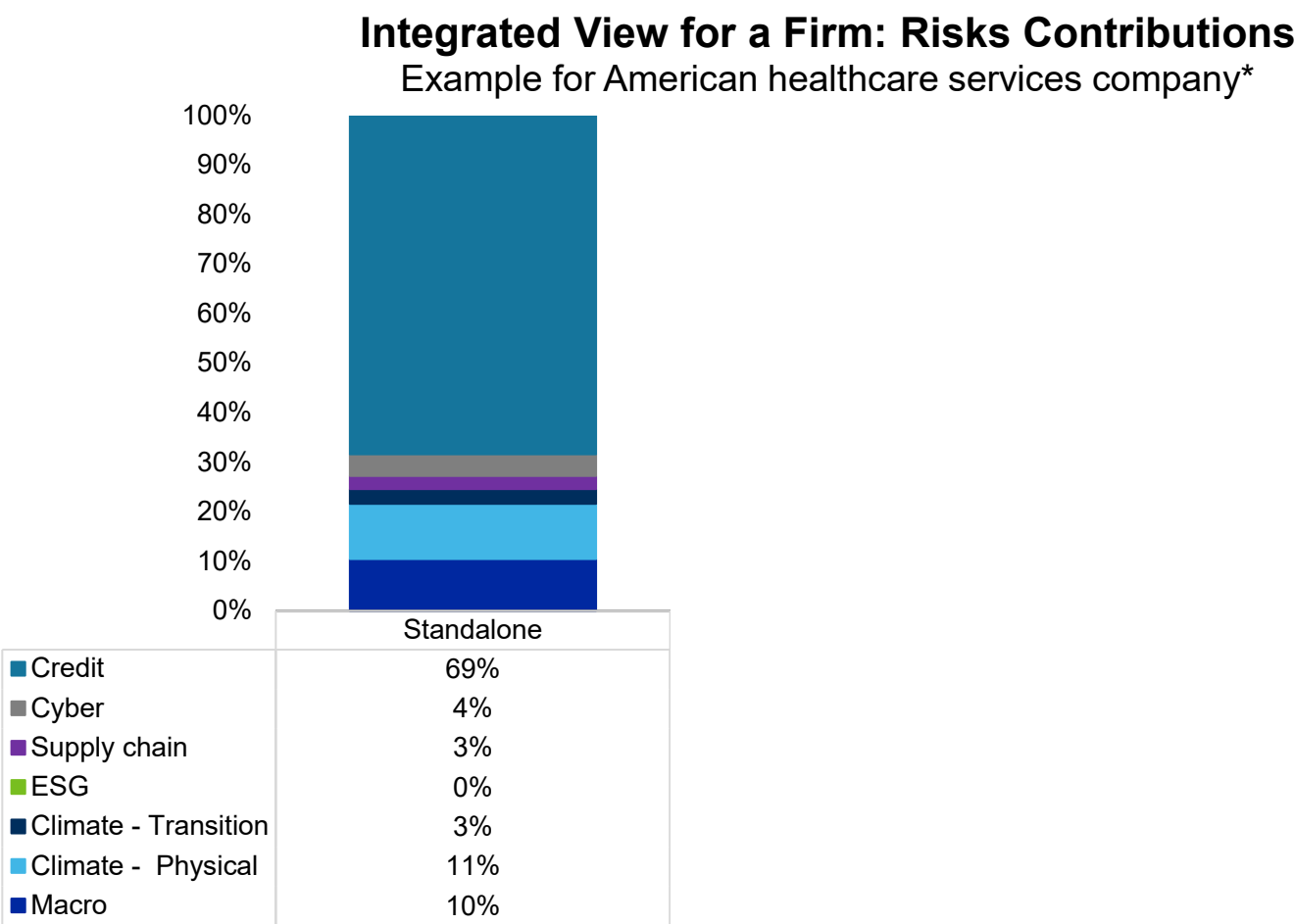
Multi-dimensional View: Included Risks and Forecast Horizons

Example for American healthcare services company

	Risks	Risk-specific Metrics	Risk-specific Horizon
Systemic	Macro	Ba3	3Y
	Climate Physical	Ba3	10Y
	Climate Transition	Ba2	10Y
Idiosyncratic	Credit	Ba1	1Y
	Cyber	630 / 900 - Intermediate	1Y
	Supply Chain	Ba2	3Y
	ESG	42 / 100 – Advanced	1Y

Which Risks Should I Worry About More and Why?

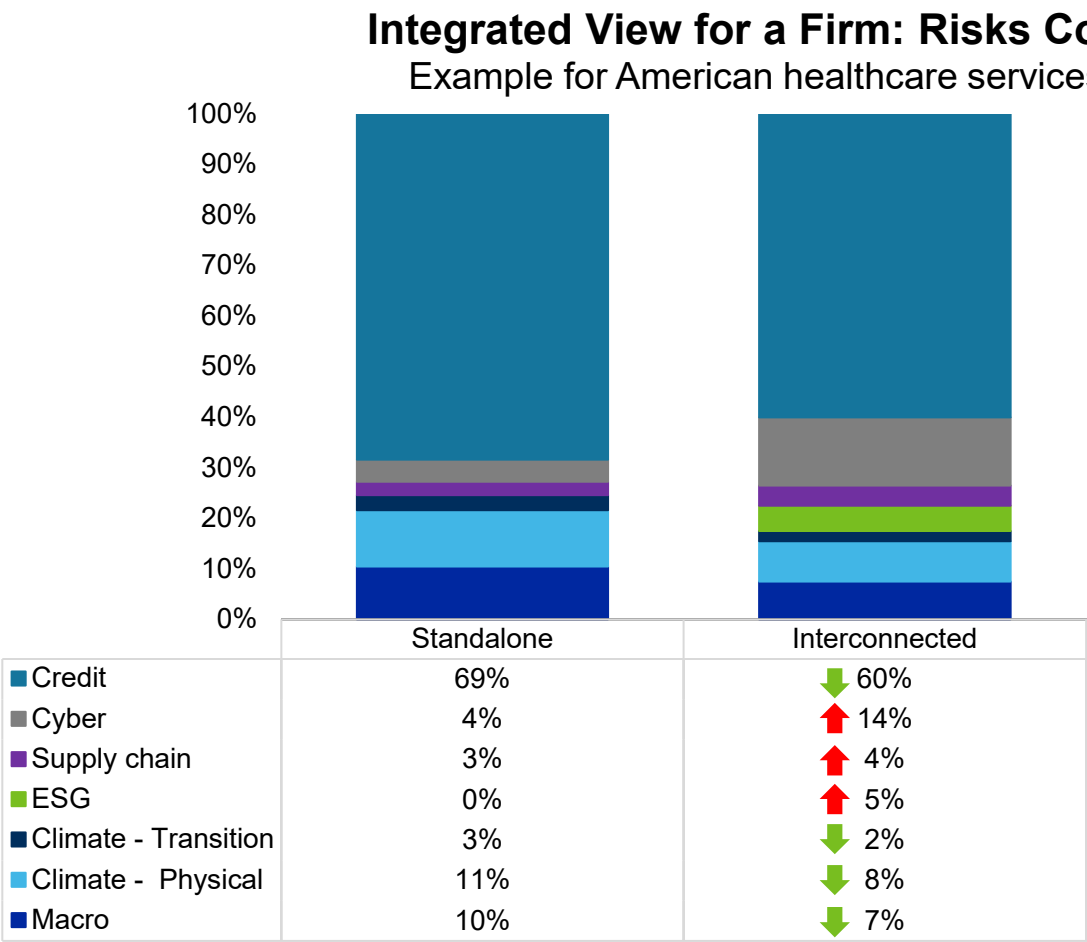
Common metrics help to compare risk materiality on like-for-like basis



*3 years forecasting horizon, 30% asset value drop due to included risks (5% expected and 25% unexpected)

Which Risks Should I Worry About More and Why?

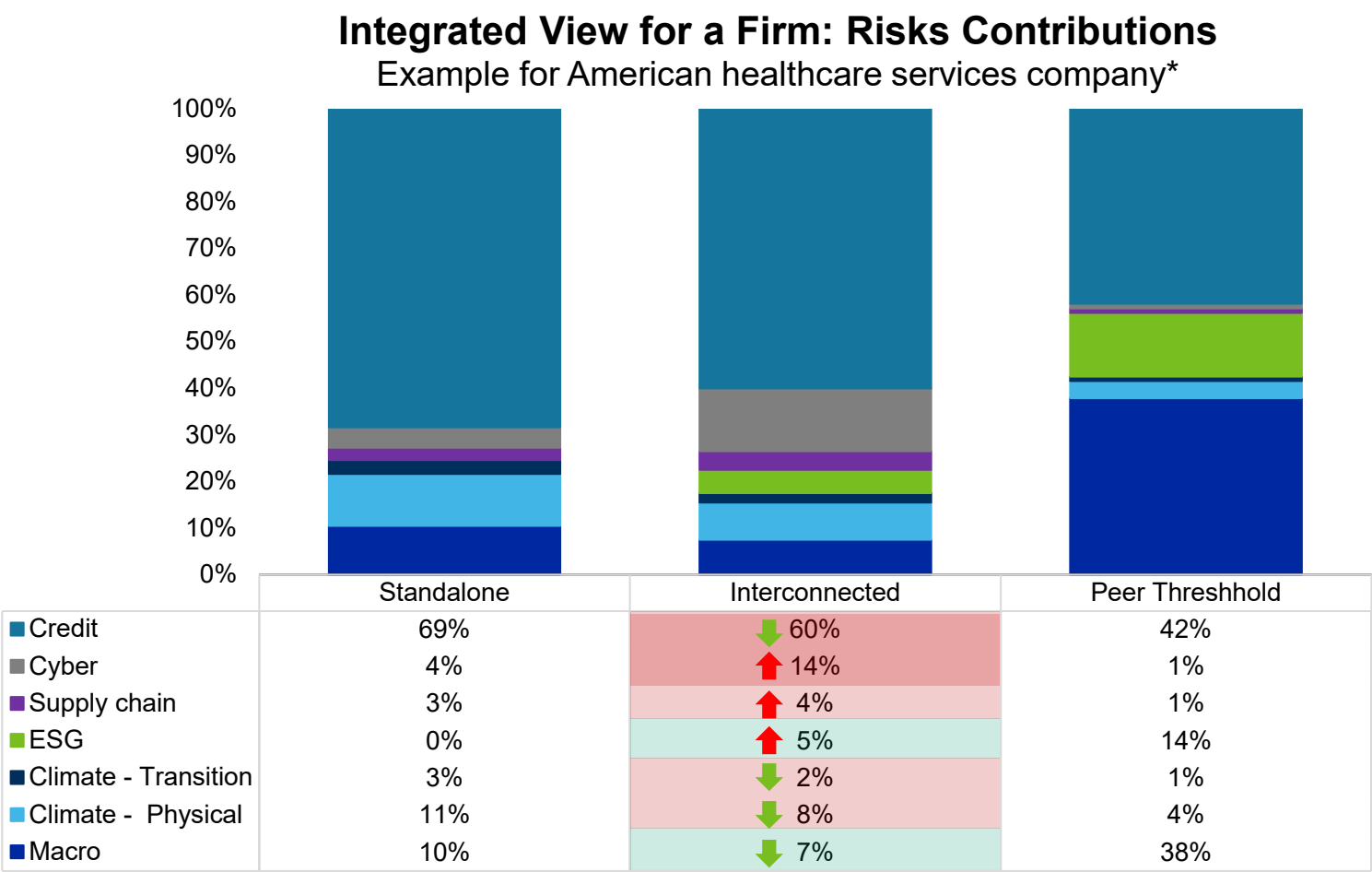
Risk interconnectedness uncovers offsetting and propagating effects



*3 years forecasting horizon, 30% asset value drop due to included risks (5% expected and 25% unexpected)

Which Risks Should I Worry About More and Why?

Location and industry-specific threshold tell you which risks to worry about

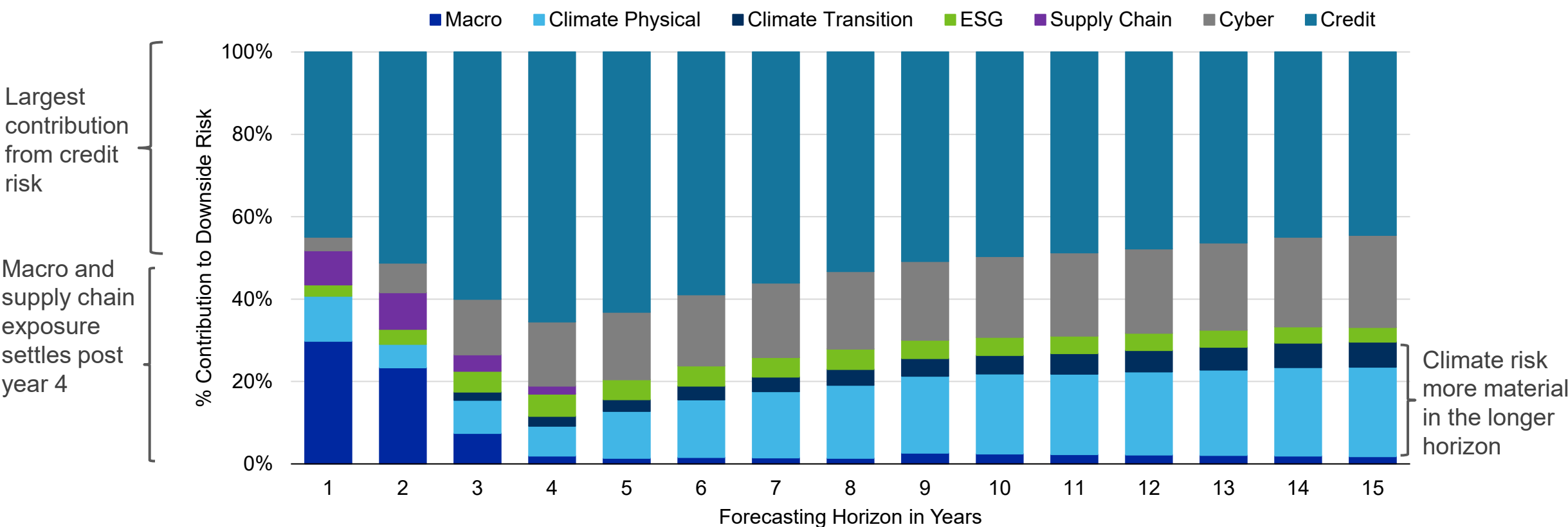


*3 years forecasting horizon, 30% asset value drop due to included risks (5% expected and 25% unexpected)

When Do I Get Worried?

The materiality of risks evolves with time

Integrated View for a Firm: Risks Contributions Across Forecast Horizons
Example for American healthcare services company*

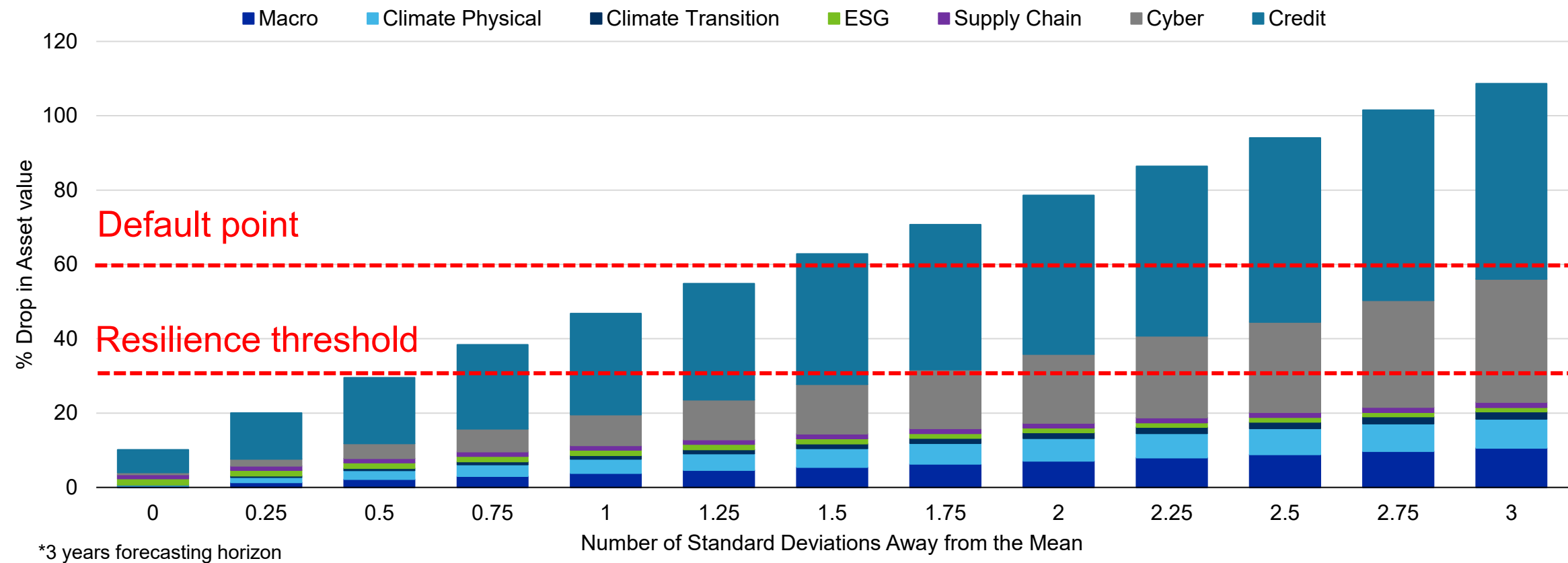


*3 years forecasting horizon, 30% asset value drop due to included risks (5% expected and 25% unexpected)

How Far is a Firm from an Existential Threat?

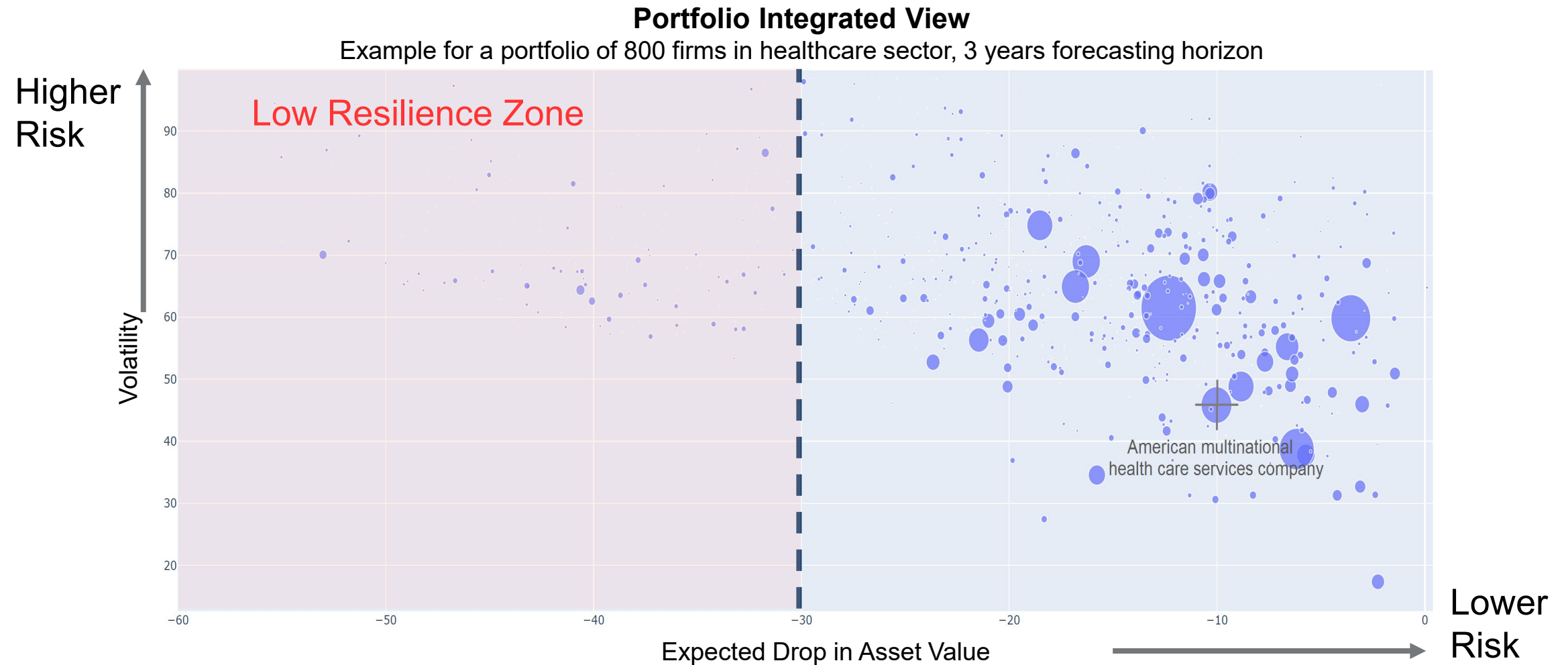
If things turn worse than expected, how bad can they get

Integrated View for a Firm: Drop in Asset Value With Increasing Variability
Example for American healthcare services company*



Who Should I Worry About?

Combine expected return and volatility to quickly identify less resilient firms

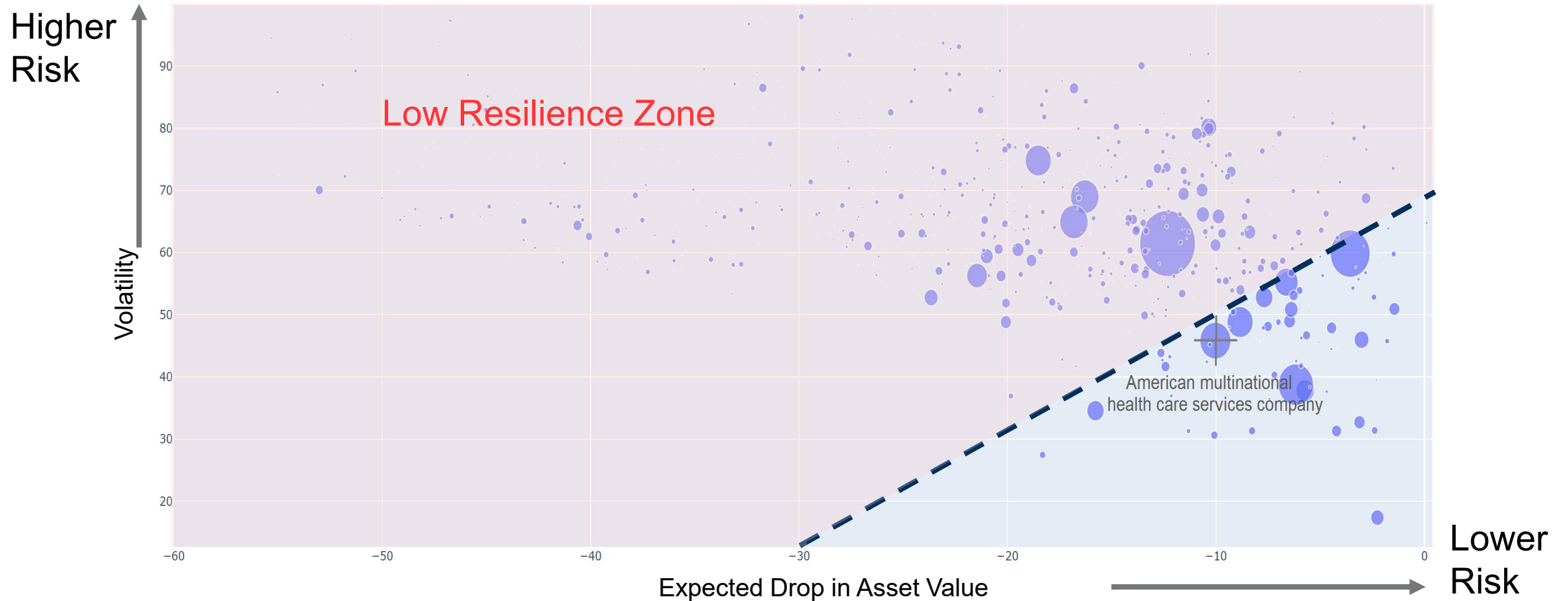


Who Should I Worry About?

Combine expected return and volatility to quickly identify less resilient firms

Portfolio Integrated View

Example for a portfolio of 800 firms in healthcare sector, 3 years forecasting horizon

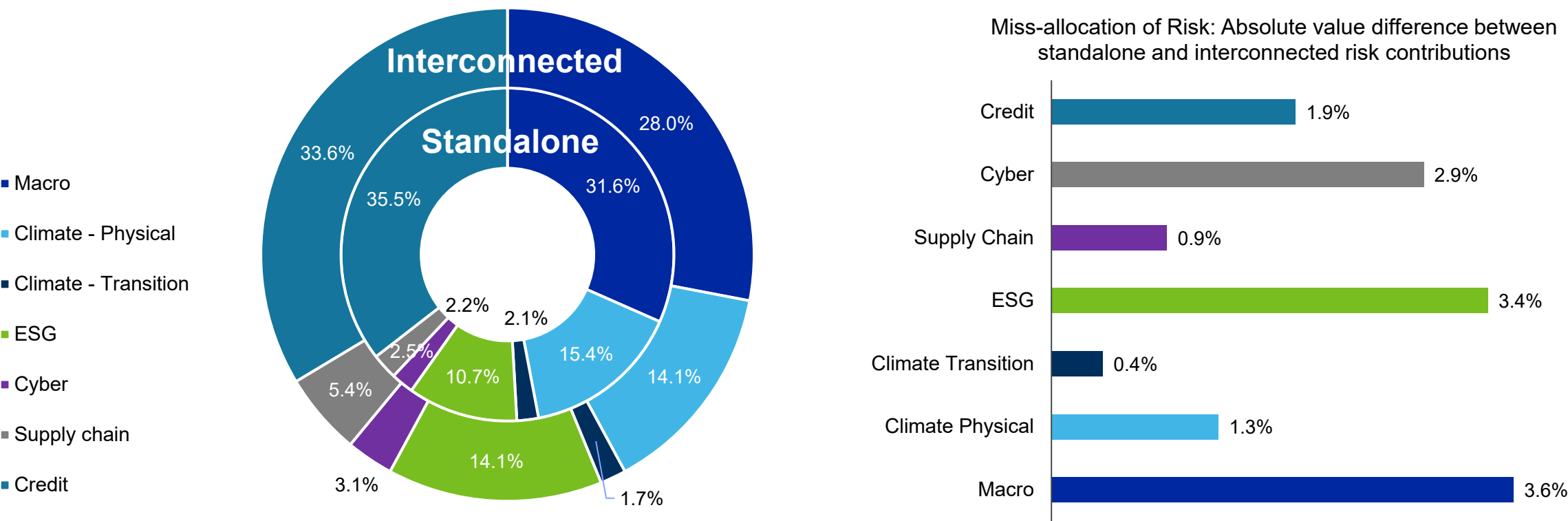


How To Improve My De-Risking Strategy?

Accounting for risk interconnection achieves desired outcome with **14% lower costs**

Portfolio Integrated View

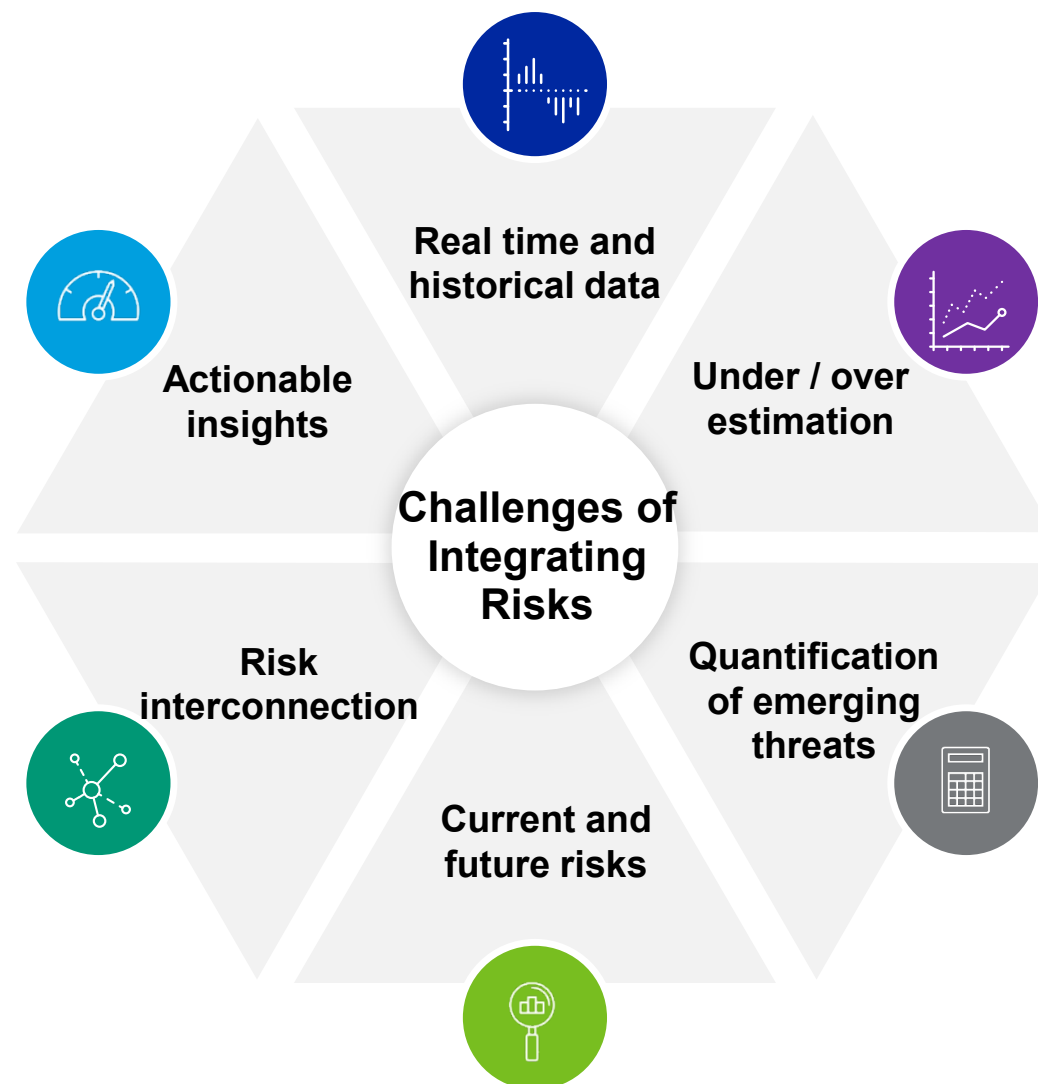
Example for a portfolio of 800 firms in healthcare sector, 3 years forecasting horizon



Key Takeaways

- » **Risks are connected:** increasingly complex and inter-connected world means practitioners cannot manage risks in silos and need to link various risks together
- » **Overall risk needs quantification under common metrics:** capture the right information in a timely manner and incorporate emerging risks in multi-dimensional forward-looking manner
- » **Actionable insights to be enabled:** identify risk signals and opportunities across material risk domains in a unified and consistent framework

Integrated risk assessment as an essential tool to navigate uncertainty and build resiliency



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