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The IFoA Conference 2022

22–23 June – etc.venues, 133 Houndsditch, London



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Supporting the transition

Insights from the Bank of England's Climate Biennial Exploratory Scenario (CBES)

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Climate Biennial Exploratory Scenario Objectives



Assess and promote improvement of participants' **climate risk management capabilities**.



Size the financial exposures of participating firms and the financial system more broadly to climate-related risks.



Understand the challenges to participants' business models from these risks, gauge their likely responses, and the implications this carries for the provision of financial services.



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The stylised scenarios used in this exercise are illustrations of possible paths for climate policy and global warming, not forecasts

Key: ● Limited ● Medium ● High	Early Action	Late Action	No Additional Action
Transition to net zero begins in	2021	2031	n.a
Nature of transition	Early and orderly	Late and disorderly	Only policies that were in place before 2021
Physical risks	● Limited	● Limited	● High
Impact on output	● Temporarily lower growth	● Sudden contraction (recession)	● Permanently lower growth and higher uncertainty
Average annual output growth in the UK	● Year 6—10 1.4% ● Year 11—15 1.5% ● Year 26—30 1.6%	● Year 6—10 1.5% ● Year 11—15 0.1% ● Year 26—30 1.6%	● Year 6—10 1.4% ● Year 11—15 1.4% ● Year 26—30 1.2%



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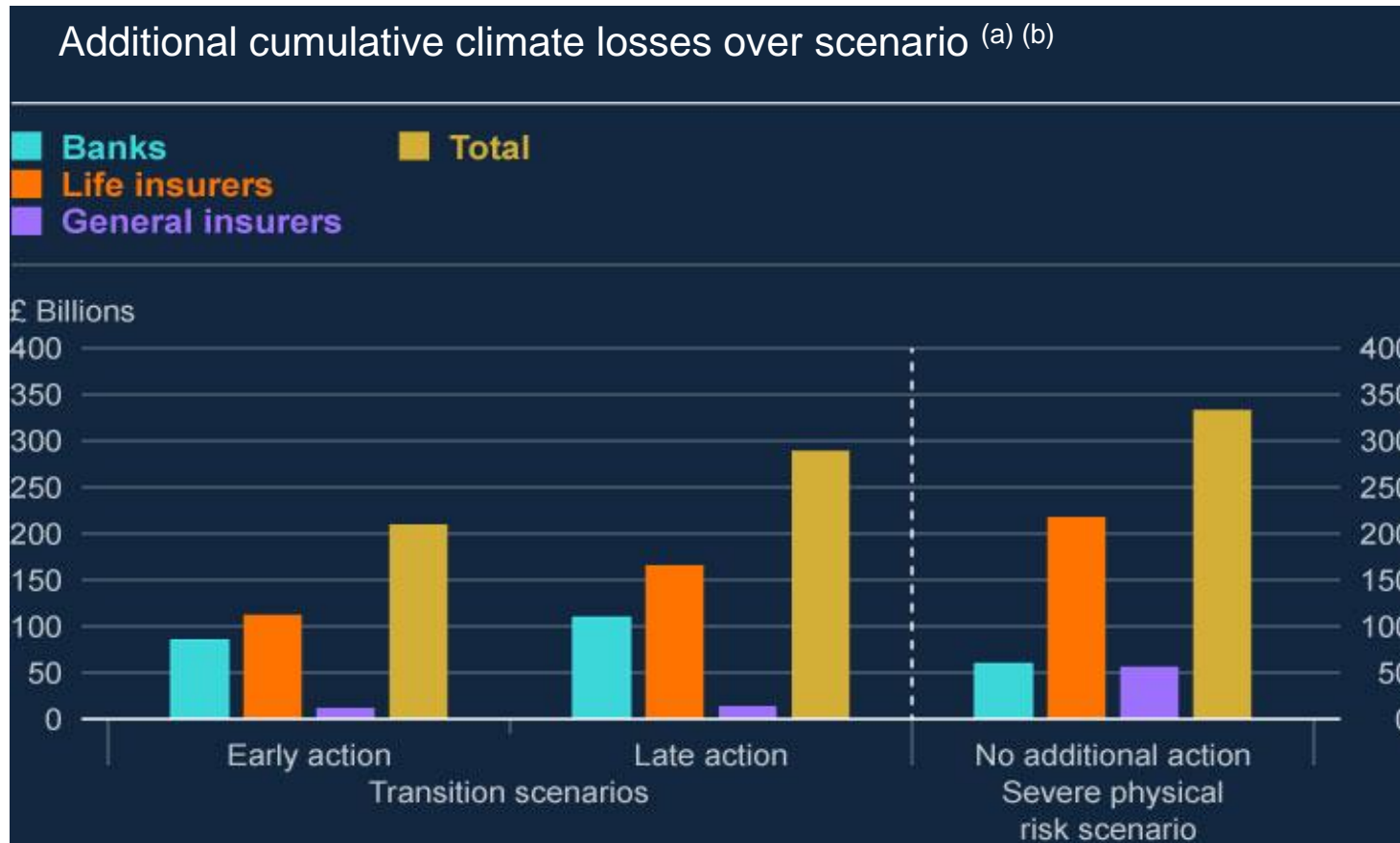
Risk Management

- UK banks and insurers are making **good progress in some aspects of their climate risk management, but still need to do much more** to understand their exposure to climate risks.
- **Data gaps are a common problem, and mean climate risks are being only partially measured. Examples include:**
 - Information on corporate emissions across value chains
 - Geographical location of corporate assets
 - Up to date energy efficiency (EPC) ratings
- **Most firms were reliant on third party model providers,** and so need to improve their ability to scrutinise and adapt these models, or develop in-house modelling.



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Climate change, and the impact of policies aimed at limiting it, will create risks for businesses and households, and so for the financial system



(a) Incremental additional losses compared with losses that would be expected to occur in a hypothetical counterfactual scenario in which there are no additional headwinds from climate risks.

(b) For banks, chart shows cumulative 30-year impairment losses on bank lending. For life insurers it shows additional investment losses at year 30. For general insurers it shows additional investment losses at year 30, plus the cumulative increase in average annual loss over 30 years relative to year zero, plus additional investment losses at year 30.

- Overall climate losses associated with the No Additional Action scenario are the largest.
- For all participants, losses are lower in the Early Action vs the Late Action scenario.
- UK banks' and insurers' projections suggest they are likely be able to bear the costs of transition that fall on them. But not all channels are captured, and there is considerable uncertainty about those that are captured.



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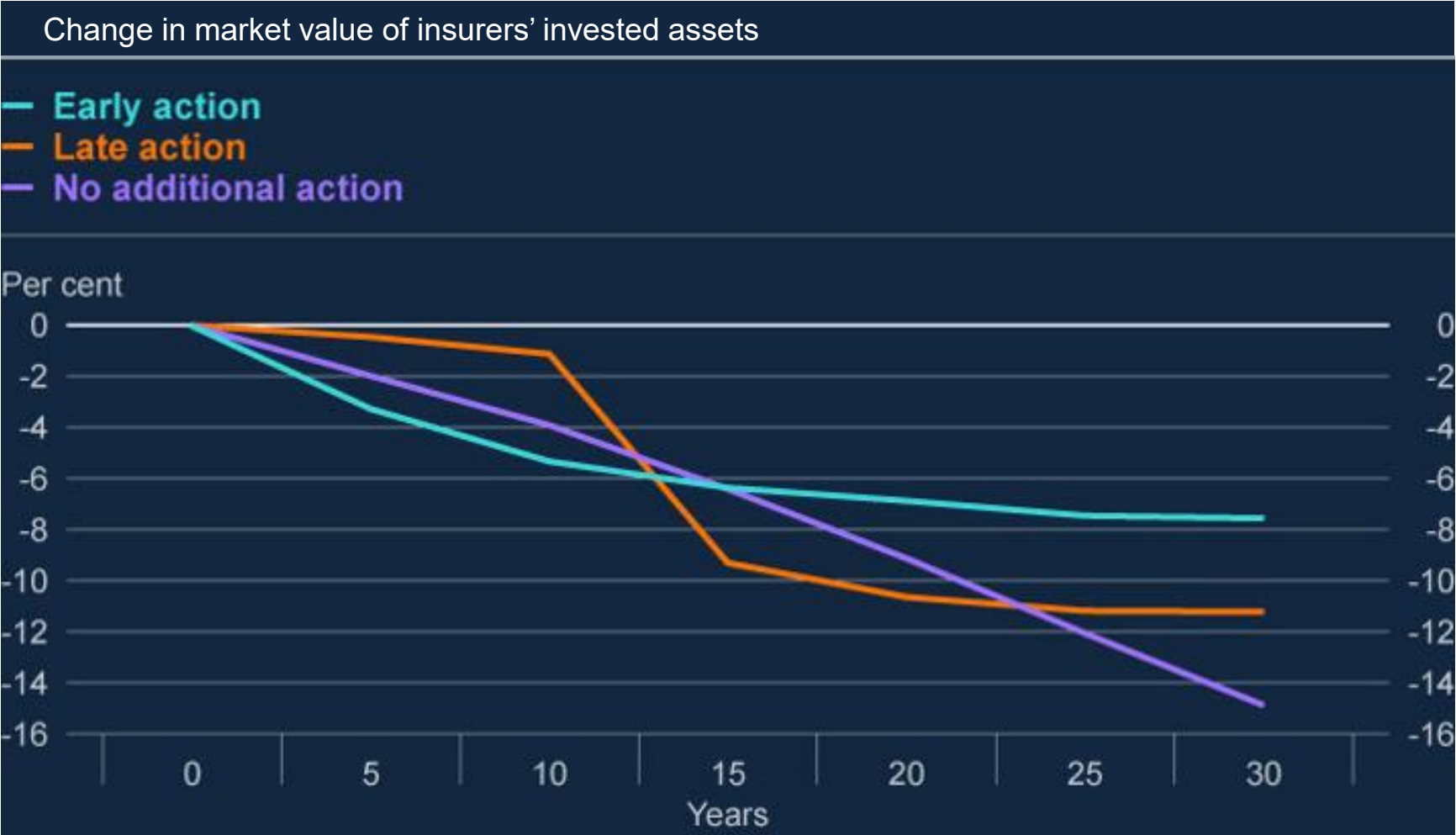
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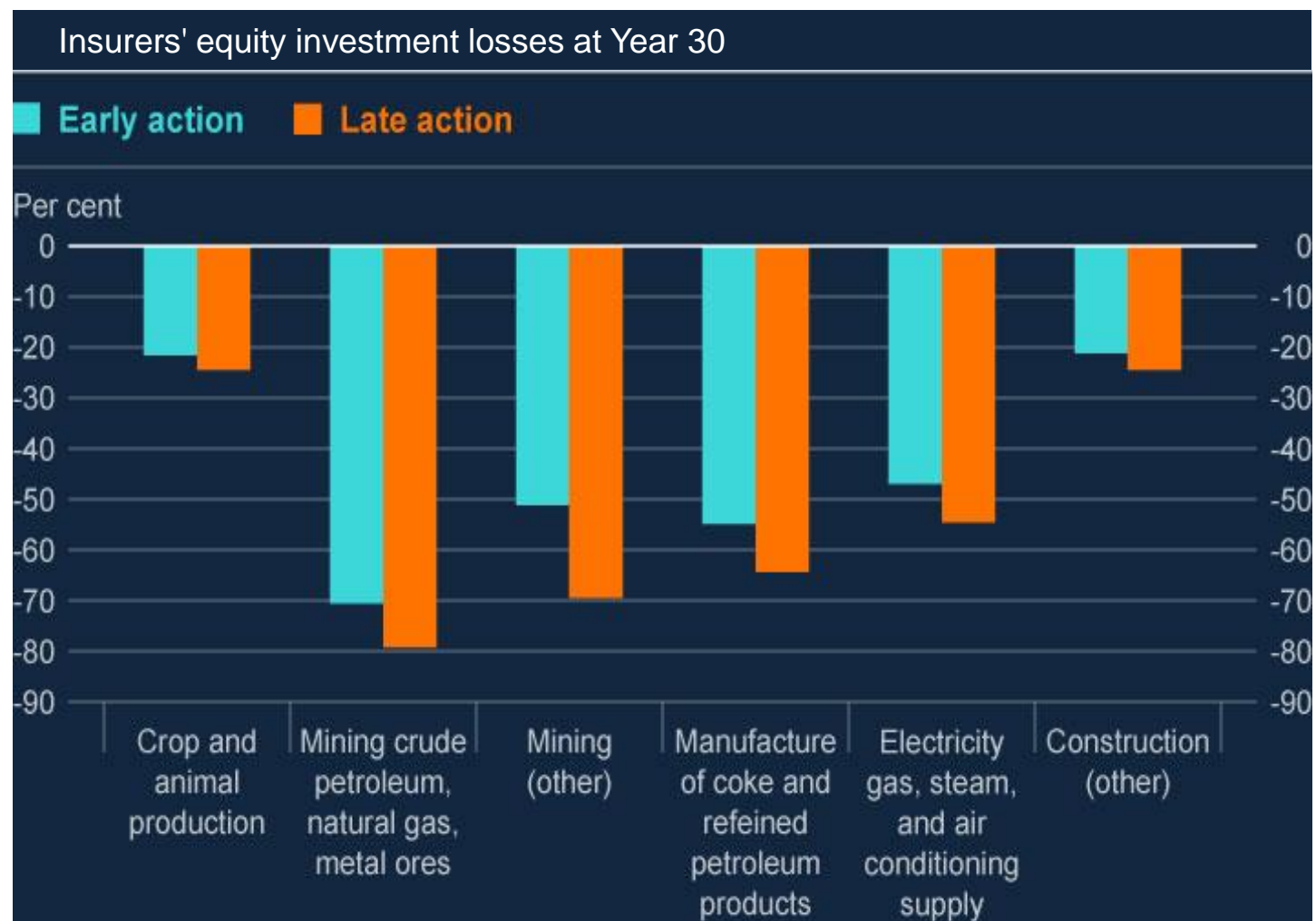


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Projected investment losses are largest in the NAA scenario

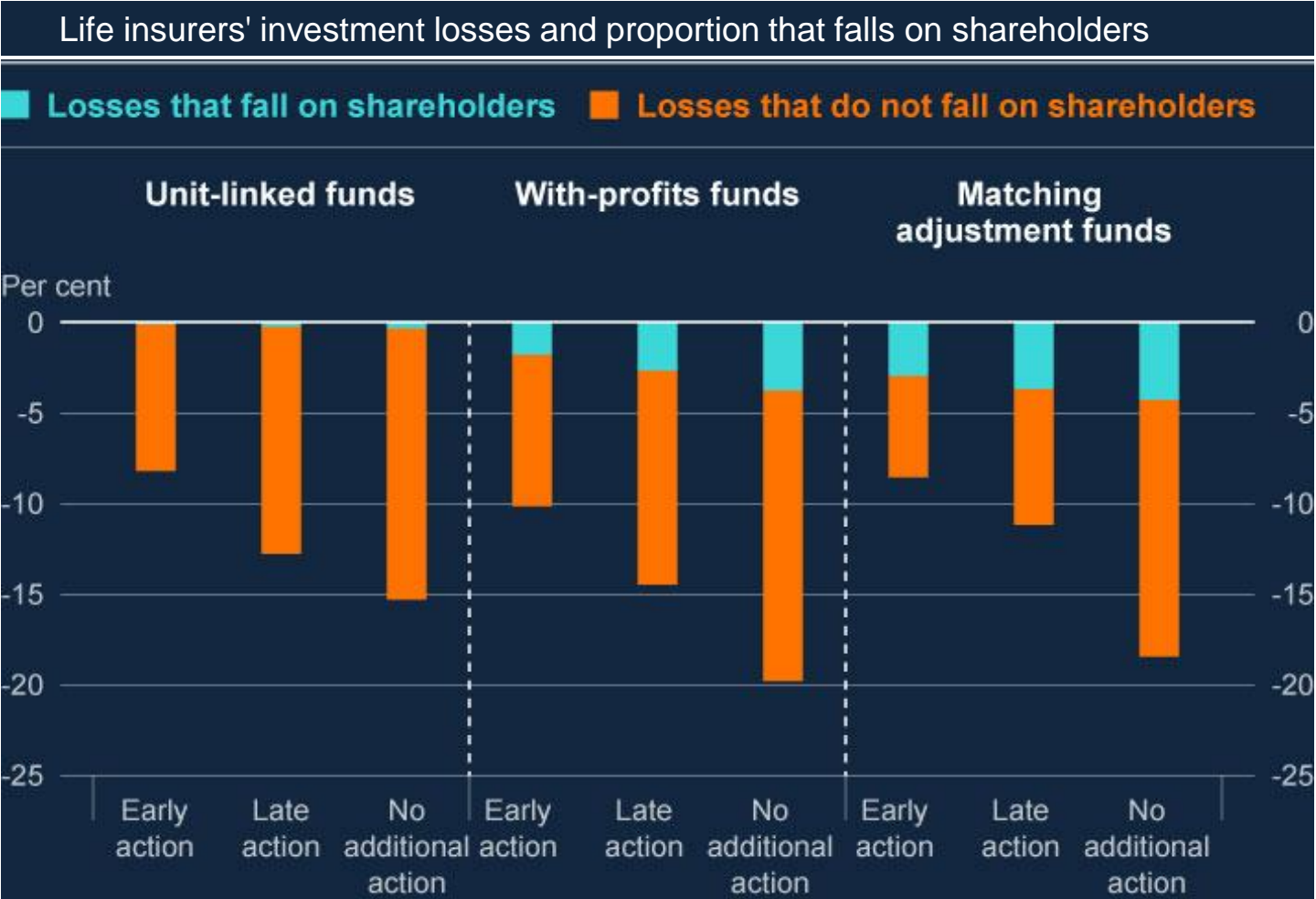


Transition losses are concentrated in carbon-intensive sectors



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Only part of total investment losses reduce capital resources



Life insurers' submitted losses spanned a wide range



Differences across firms were largely driven by methodological choices

- Incorrect or inconsistent implementation of the counterfactual
- Use of rating yield curves to price bonds with no allowance for rating transition
- Variation in the transition / adaptation assumptions made at a company or sector level

inconsistent
interpretation of the
guidance

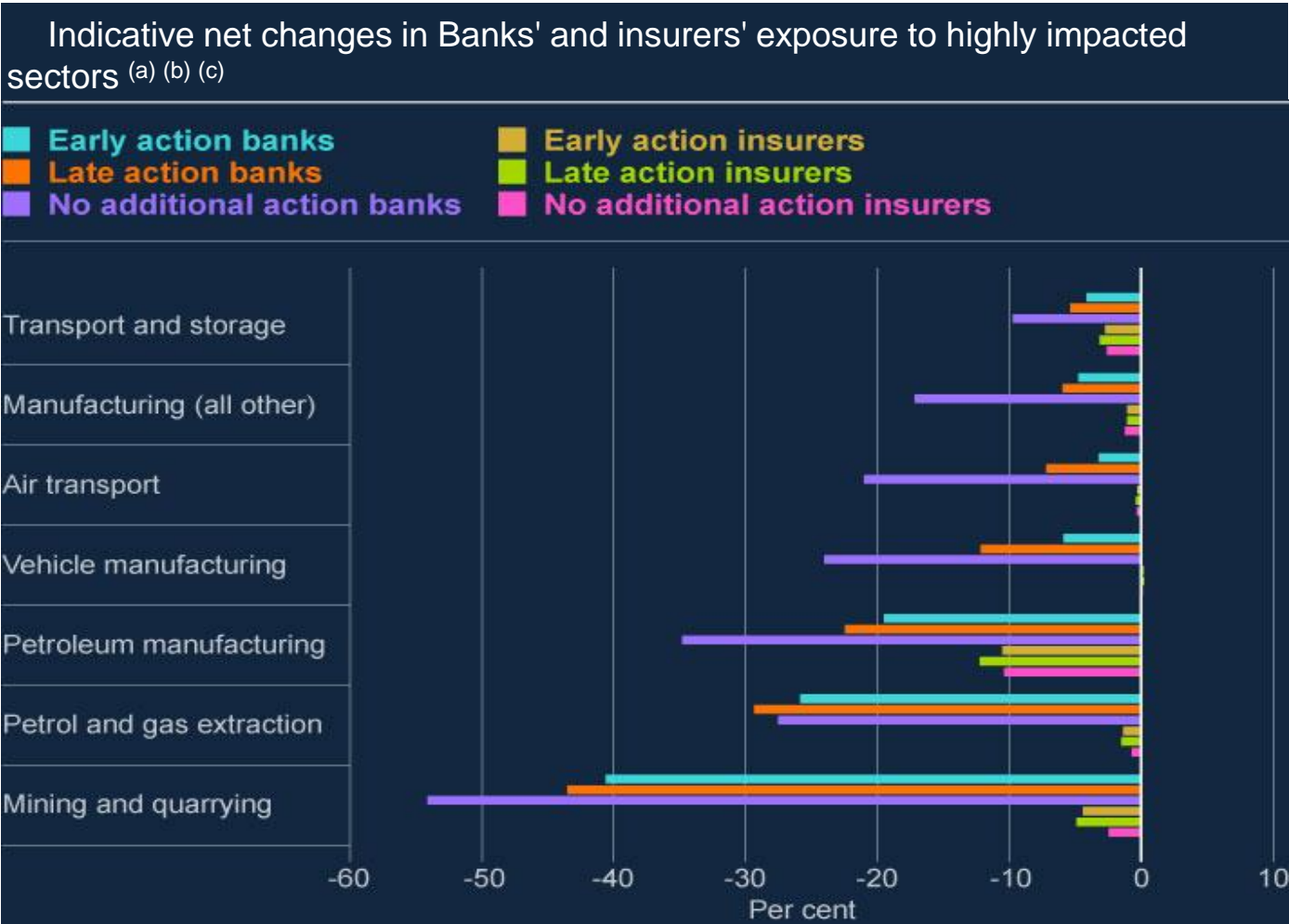
- Extent to which diverse activities within a conglomerate are recognised
- Selection of starting financial position for corporate tier 1 analysis (e.g. Covid impact)
- Basis for current market pricing and degree of market foresight assumed
- Choice of equity (e.g. dividend discount or Merton) and bond valuation models (e.g. historical rating transition tables or Merton).

Subtle but significant
modelling choices



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Banks cut financing to the most carbon-intensive industries more than insurers



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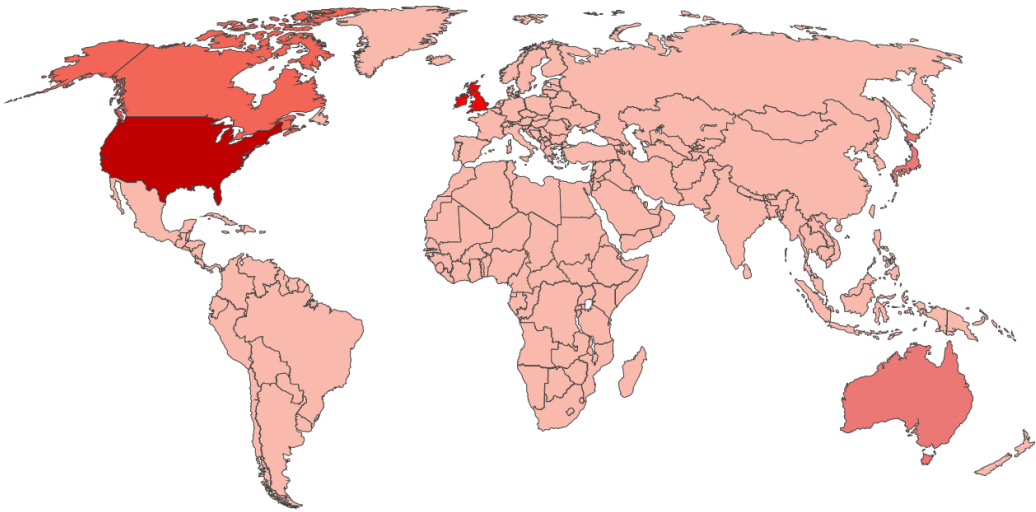
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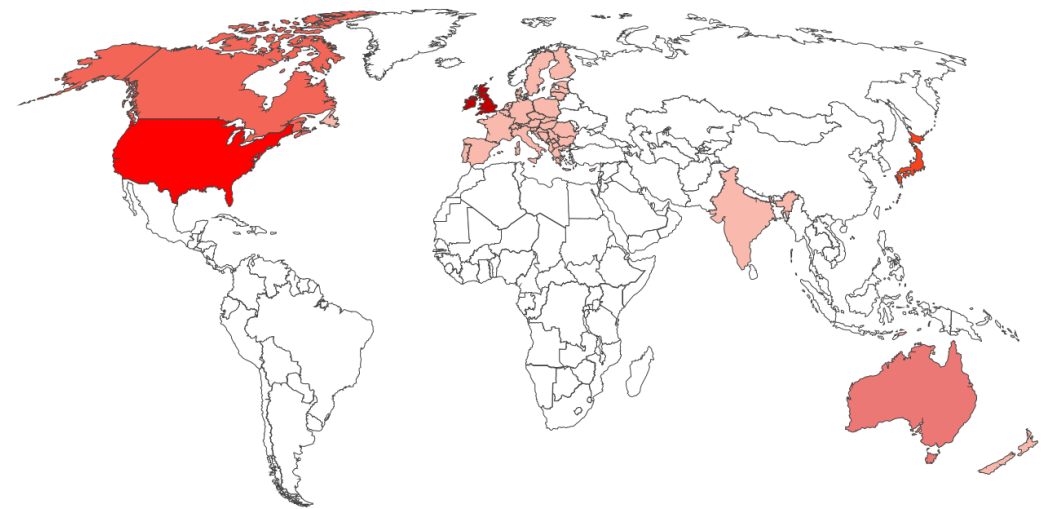
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General insurers have global exposure but assessment was limited where readily available models existed

Location of current exposures



Coverage of climate related insurance models



Our industry's conclusions about climate change materiality is largely limited by model availability

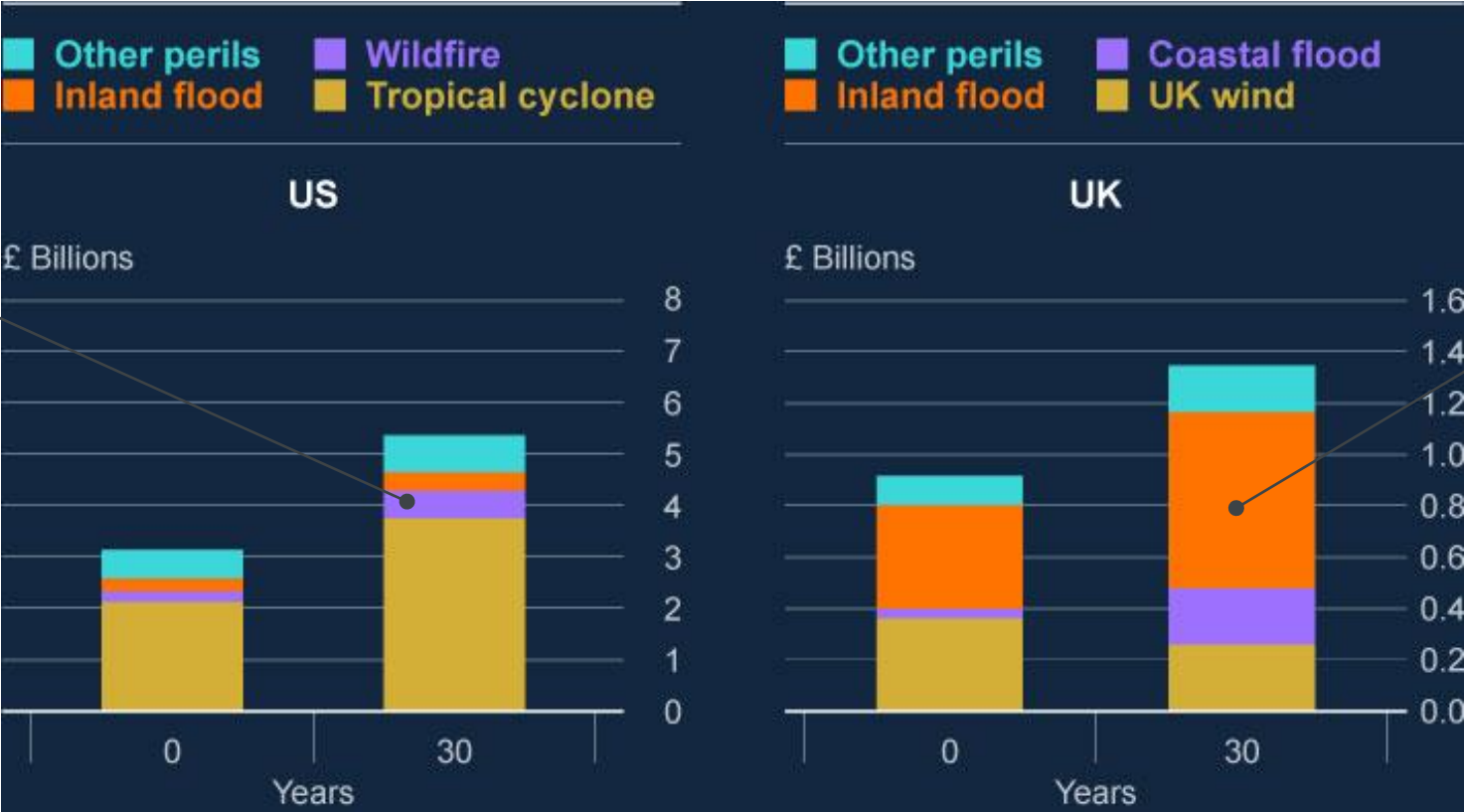


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Sizing participants' exposures: peril materiality

Average annual losses on liabilities in the NAA scenario (a)

Relative ranking of non-peak perils could change in materiality (eg US wildfire)



Inland flood could become more material than windstorm (AAL)

(a) Chart shows most material three perils in terms of their impact on US and UK general insurance losses. 'Other Perils' includes winterstorms and severe convective storms (US); freeze-thaw weathering and subsidence (UK).



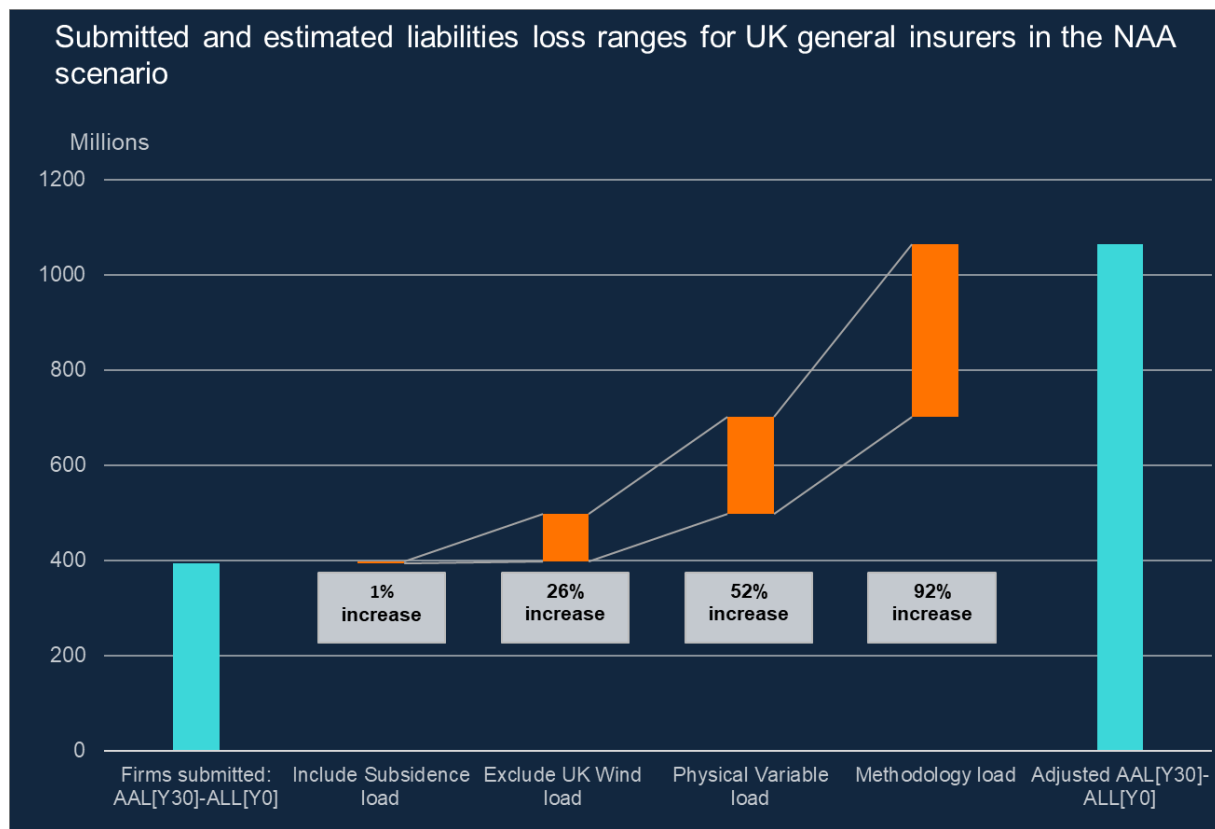
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Participants struggled to match provided physical variables

Deviation from PRA benchmark variables for UK variables

		Temperature (average)	Temperature (daily max)	Wind speed (average)	Wind speed (daily max)	Precipitation (London)	Precipitation (average)	Precipitation (summer)	Precipitation (winter)	Sea level rise (Southend)	Sea Level rise (average)	Soil moisture
Eight sample firms		3.20									0.39	
		1.57	1.54			1.20	1.30	(8.50)	8.10			
		-	-		(5.11)	-	-		23.42	0.45	0.39	(1.55)
							7.31	(4.52)	16.92	0.56	0.48	
				(0.06)			7.31			0.56	0.48	
						8.28	5.44	4.20	8.99			
						6.20	8.00	(12.28)	20.09		0.45	
PR		3.24	2.64	(18.52)	(17.33)	15.83	10.99	(2.34)	24.41	0.63	0.39	(2.24)

Staff calculation suggest potential underestimation at industry level



Sensitivity test 1 – Coverage of perils:

- Loaded UK subsidence to firms who did not model this peril
- Removed UK wind storm

Sensitivity test 2 – Physical risk variables:

- Assessed AAL impact by assuming firms used physical risk variables same as the BoE benchmark data for UK inland flood

Sensitivity test 3 – Modelling methodology:

- West coast storm surge
- Flood defences
- 3rd party model input data (up-to-date)



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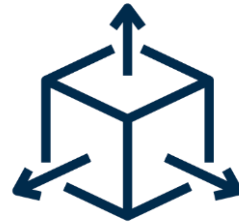
What better practice look like



Use of physical variables

Good justification where values materially deviated from that prescribed

Modelled a wide range of physical perils, beyond those of the most readily available catastrophe models



Use of third party models

Identified limitations of third party models used, and made adjustments to address these

Considered additional factors that could amplify modelled losses, such as social inflation, increased costs of materials, labour & supply chain



Results Validation & Review

Engaged with internal and external specialists to validate and challenge results. (incl. explicit sensitivity)

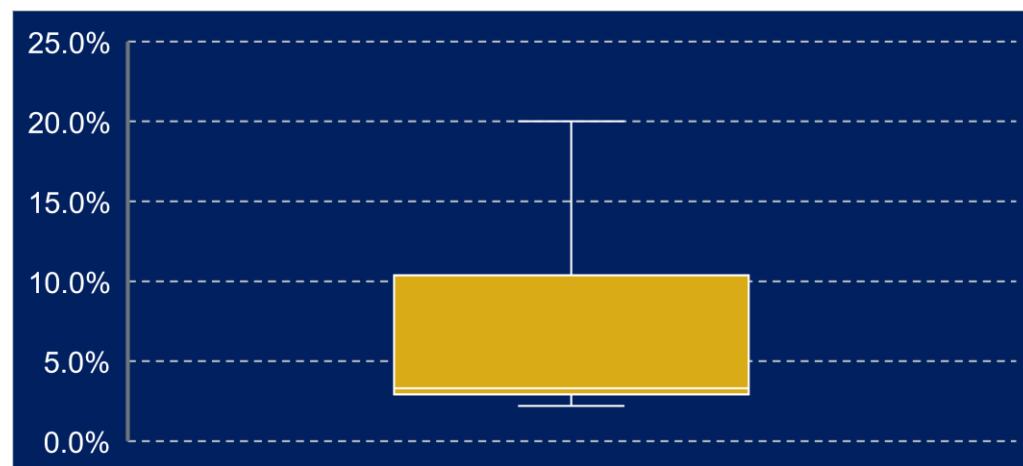
Compared modelled results to alternative models



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Do the business plan implication consider insurance cover?

Expected UK flood uninsurability coverage



- Average premiums expected to rise by 8%
- But for 5% of postcodes Flood AAL expected to rise 5.5x
- Implications on uninsurability complex, but could translate to ~2 million households
- Firm estimates of uninsurability ranged from 2% - 20%
- Implication for flood defence maintenance and Flood Re



Figure: areas in the UK most affected by uninsurability under the NAA scenario. Darker shade indicates higher number of uninsurable households.

Source: PRA submissions, Fathom flood hazard data



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General insurance litigation exercise

 Overall, a valuable exercise for participating firms

 Most firms at an early stage of thinking about exposure to climate-related litigation

 Most did it entirely in-house (UW/Claims/Risk/Legal). Limited use of external consultants

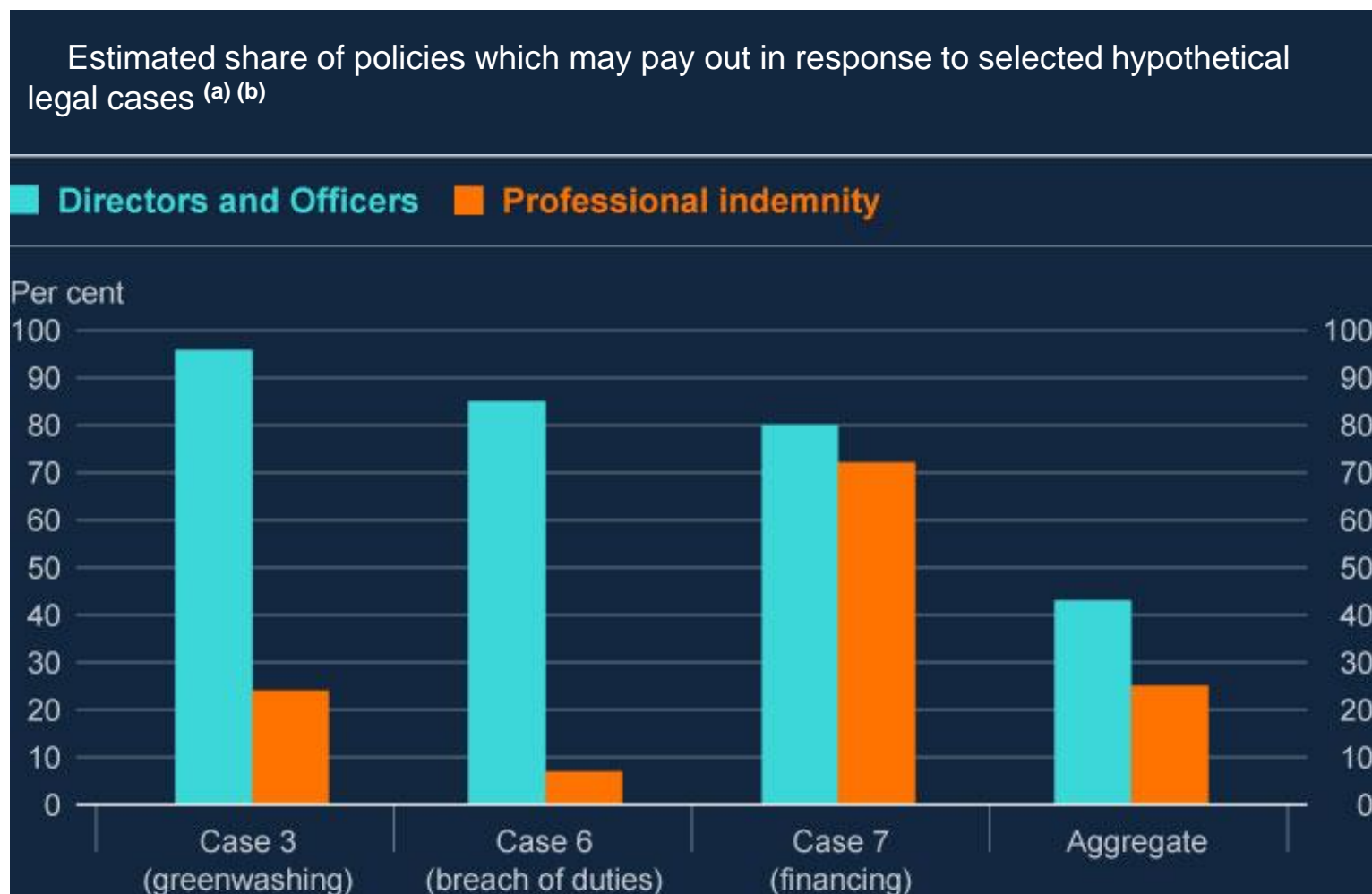
 Data challenges: difficulty in extracting sector-level data from systems and hence carry out effective sectoral and product level exposure management

 High-level scenario definition resulted in variety of approaches and incr. complexity



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Climate Litigation Risk



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Actions and Next Steps

This is not a capital setting exercise, but could help inform future work on capital requirements

Actions for the Bank

- Assess firms' progress against supervisory expectations especially where more intensive action is needed.
- PRA and the Bank work on use of capital framework to address financial consequences of climate change.
- The FPC will monitor any risks to the financial system as a result of possible large-scale withdrawals of credit from particular sectors.

Supporting work of others

- Share key lessons with the UK Government and the Bank's peers internationally.
- Publicly support the development of standards and frameworks for net zero transition. ISSB. Transition Plans.



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Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



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