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GIRO Conference 2022

21-23 November, ACC Liverpool

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Stress testing as a supervisory tool

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#GiroConf22



Session overview

- Supervisory stress testing
 - Context
 - Objectives
 - Practicalities
 - Example
 - Observations

- Questions and comments.

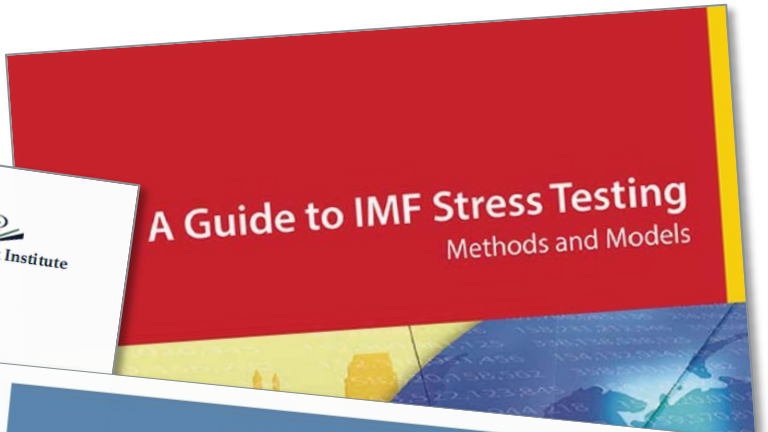


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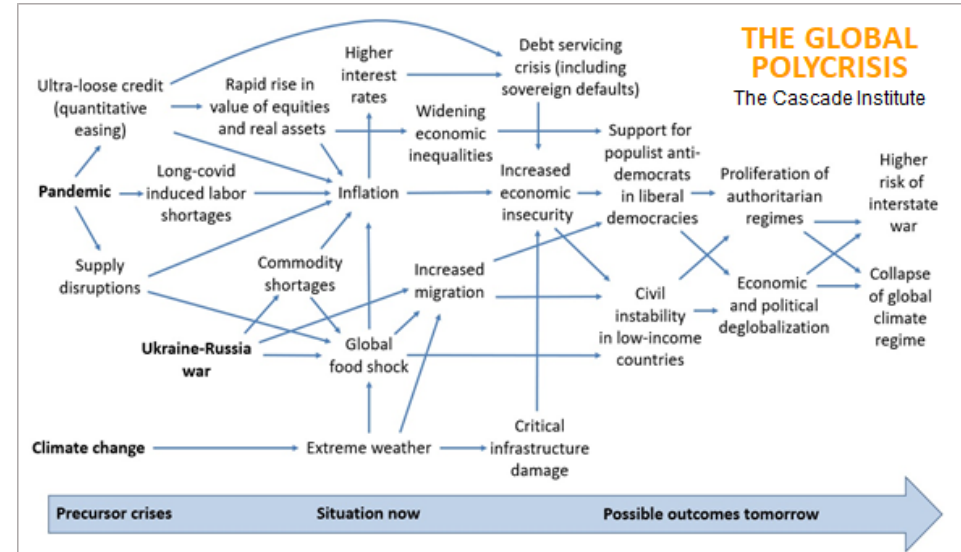
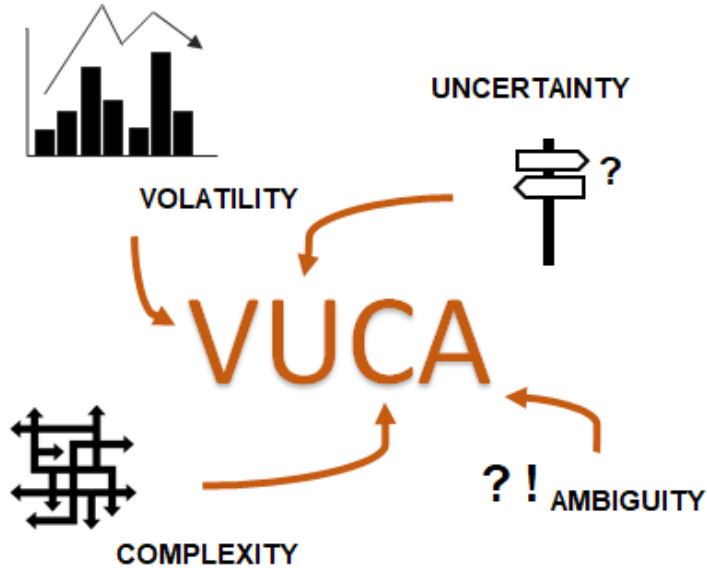
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Some light reading...



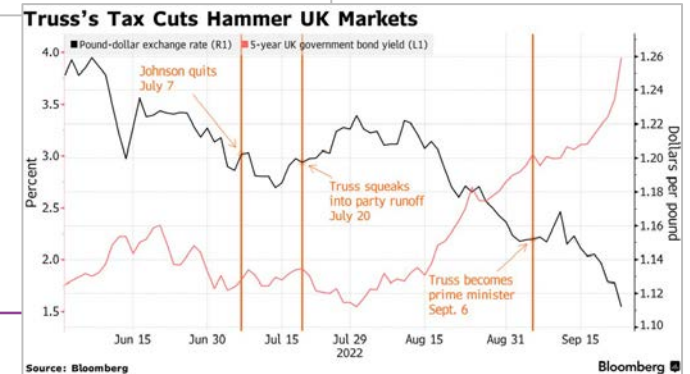
The real world context....



The Queen asks why no one saw the credit crunch coming

The Queen, whose personal fortune is estimated to have fallen £25 million in the credit crunch, has demanded to know why no one saw the financial crisis coming.

By Andrew Pierce
05 November 2008 • 4:40pm




There are known knowns; there are things we know that we know.

There are known unknowns; that is to say, there are things that we now know we don't know.

But there are also unknown unknowns - there are things we do not know we don't know.

-Donald Rumsfeld



International Association of Insurance Supervisors

ICP
24

- “
- 24.2.6 The supervisor should have in place an appropriate form of stress testing, which is applied to the insurance sector as a whole or to a significant sub-sample of insurers, selected according to the exposures to specific risks to be assessed.....*
- 24.2.7 While many data items are backward looking, insurance sector analysis should be forward looking, to the extent possible, when developing scenarios to capture potential future developments. Stress scenarios should take into account ways that market dynamics have changed, which may make historical data less relevant.*
- 24.2.8 The supervisor should use stress tests to identify vulnerabilities and risks and assess the impacts to the insurance sector and for individual insurers. Additionally, stress scenarios should be used to identify how those potential impacts may spread. ”*



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Stress test objectives

- Additional insights and a forward-looking perspective that complement Solvency II reporting

Microprudential	Macroprudential
<ul style="list-style-type: none">• Assessing the resilience of insurers (solo and groups) to economic, financial and insurance shocks.	<ul style="list-style-type: none">• Assessing the resilience of the insurance industry as a whole and to identify systemic risks.
<ul style="list-style-type: none">• Not pass or fail.	<ul style="list-style-type: none">• Significantly more complex.

“Looking further ahead, stress and scenario testing has more scope to develop as a supervisory tool. Areas to explore include transparency and the potential role of sector-wide stress testing in the solvency assessment framework.”

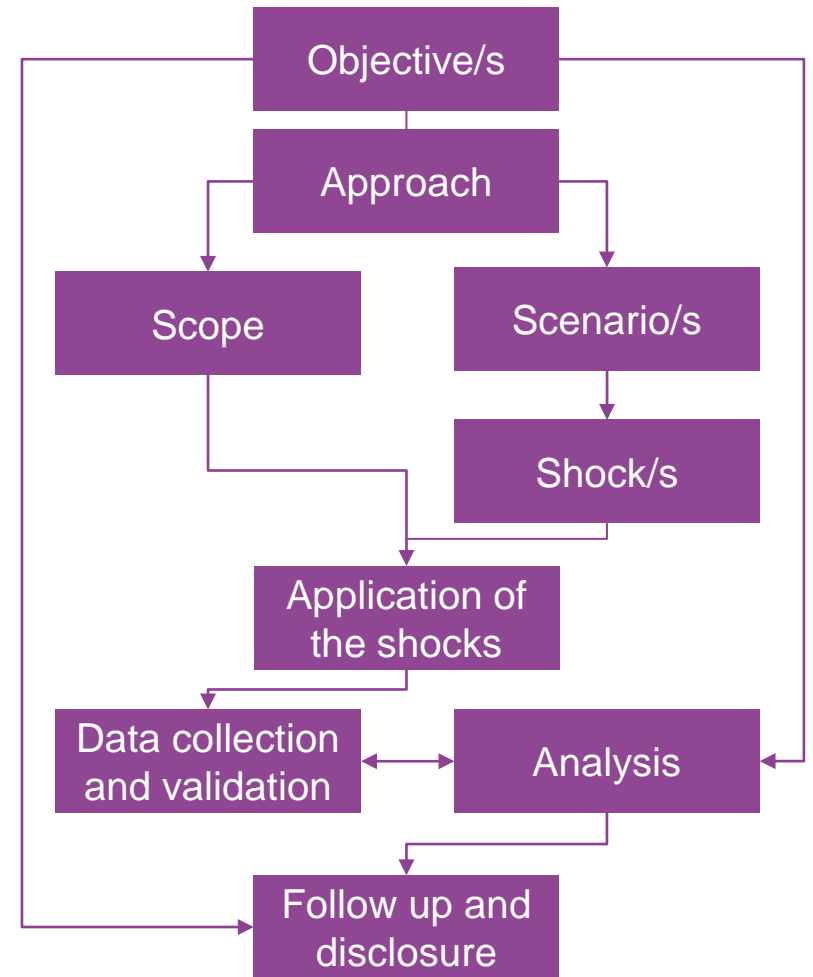
Charlotte Gerken, Executive Director, Insurance Supervision, PRA. “The fox and the hedgehog: Preparing in a world of high risk and high uncertainty” speech, December 2020.



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Practicalities of an exercise

- What's the focus of the exercise? For example:
 - Solvency
 - Liquidity
 - Climate - physical risk
 - Climate - transition risk
 - Other?
- “Top down” or “bottom up” approach



Top-down versus bottom-up

	Top-down	Bottom-up
Advantages	Supervisors control the process which can be used more effectively to get results.	The accuracy of the results leverages off insurers' more informed knowledge of risks.
	Uniformity of the test based on prescribed set of scenarios.	Results could reflect the actual vulnerability of insurers to the prescribed shocks based on their risk profile or identify additional risks and vulnerabilities.
	Knowledge of the criteria, methods and information (e.g. type, date of data) used for the exercise.	Embeds individual specificities.
Disadvantages	Resource intensive for supervisors.	Resource intensive for participants and supervisors.
	Supervisors may not have all the available data.	Lack of transparency as the insurer is privy to information supervisors may not have.
	Use of models may limit flexibility of approach.	Participants tend to present more favourable results.

Practicalities of an exercise (ctd.)

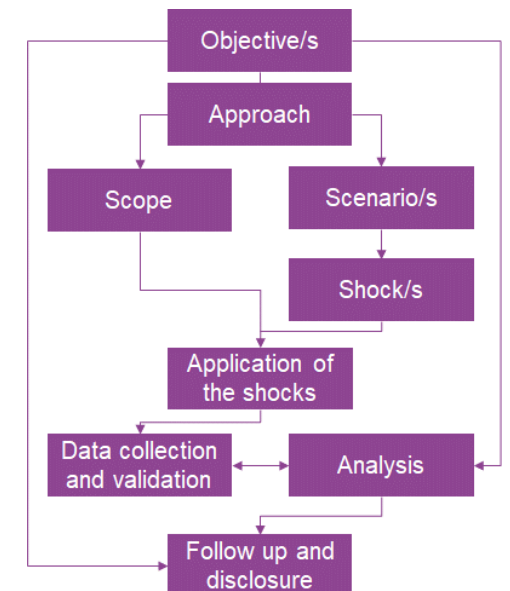
- Trade-offs:

Effort vs speed vs complexity vs precision vs frequency

- Selection of the in-scope firms, group and solo perspectives

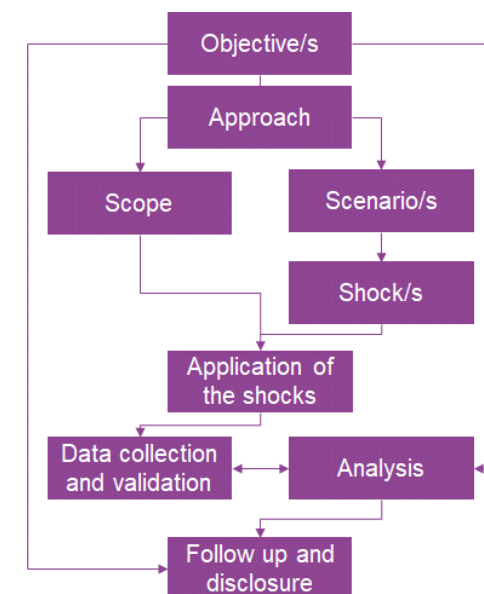
- Conceptual aspects of these “what if” exercises:

- Baseline
- Time horizon - instantaneous *or* multi-period
- Management actions – “embedded” vs “reactive”.



Practicalities of an exercise (ctd.)

- Scenario design and parameter choices:
 - Single factors i.e. sensitivity
 - Single scenario *or* multiple scenarios, with narratives
- Reverse stress testing
- Modelling and production of results
- Analysis of results
- Findings and the “so whats”.

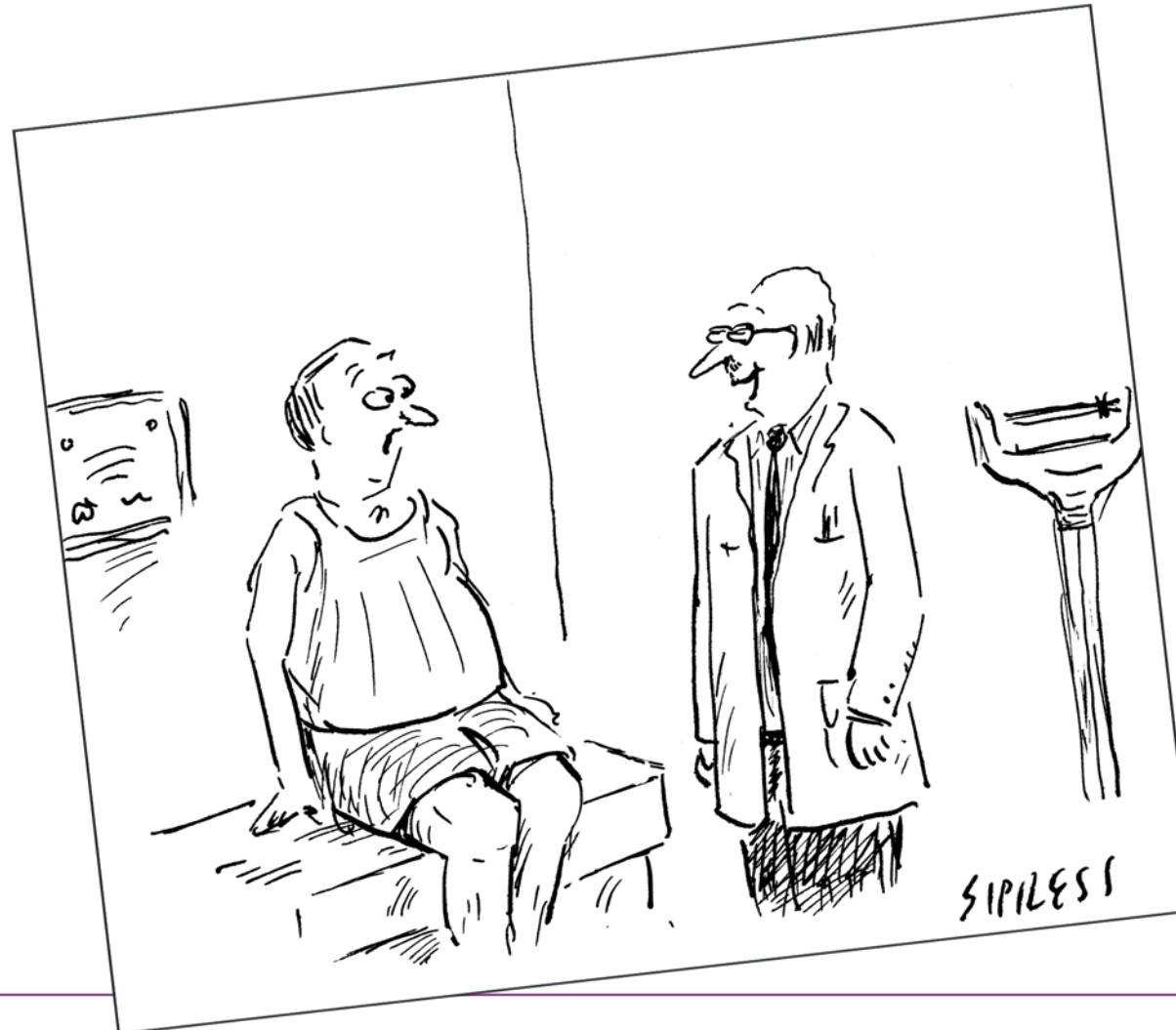


“It’s a simple stress test – I do your blood work, send it to the lab and never get back to you with the results”

Follow up and disclosure

ICP 24.2.6 Following a stress test exercise, the supervisor should discuss potential vulnerabilities and potential mitigating actions with the relevant insurers.

....and the industry as a whole and other stakeholders?



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A major undertaking and commitment of resource

Example: EIOPA Insurance Stress Test 2021



The voluminous paperwork....

2021 Insurance Report

Bank of England | Prudential Regulation Authority

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Version	Reference	Amendment
V0.1	1 st draft	Redraft of the specific shock
V0.2	2 nd draft	Feedbacks from stakeholders
V0.3	3 rd draft	Members comments
V1.0	Par.98 - Perimeter of application for the shocks	Additional scope of the shocks
V1.1	Par. 84, 93, 221	Clarification of applicability weights reported

Insurance Stress Test 2021 Technical specifications

2021 Insurance Stress Test Exercise

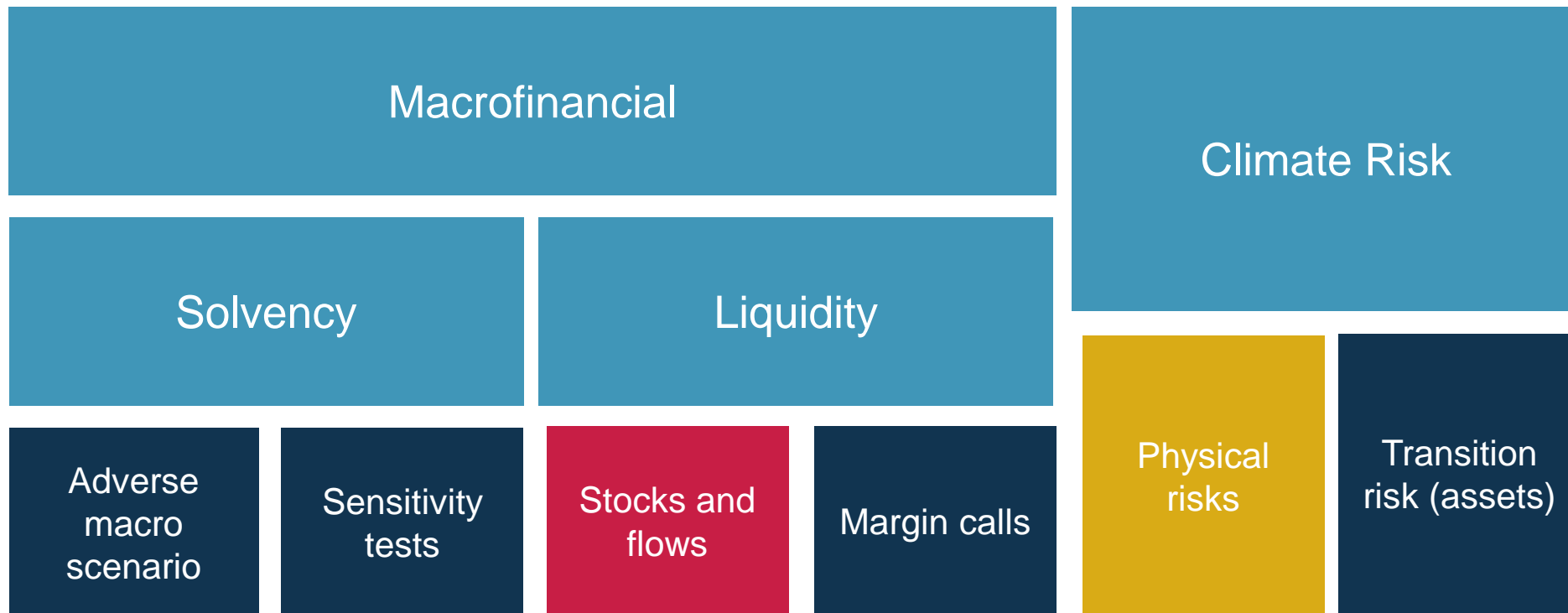
Technical Information

Shock Scenario

- RFR curves NO volatility adjustment
- RFR curves WITH volatility adjustment
- Swaps
- Government Bonds
- Corporate Bonds
- RMBS
- Covered bonds
- Equity
- Office & Commercial Real Estate
- Residential Real Estate
- Other Assets
- Mass lapse
- Mortality
- emic morbidity and Non-life cost of claims
- Reinsurance in-flows
- Written premia
- RFR curves NO volatility adjustment
- RFR curves WITH volatility adjustment



IMF Financial Sector Assessment Programme: Components of the insurance sector stress tests



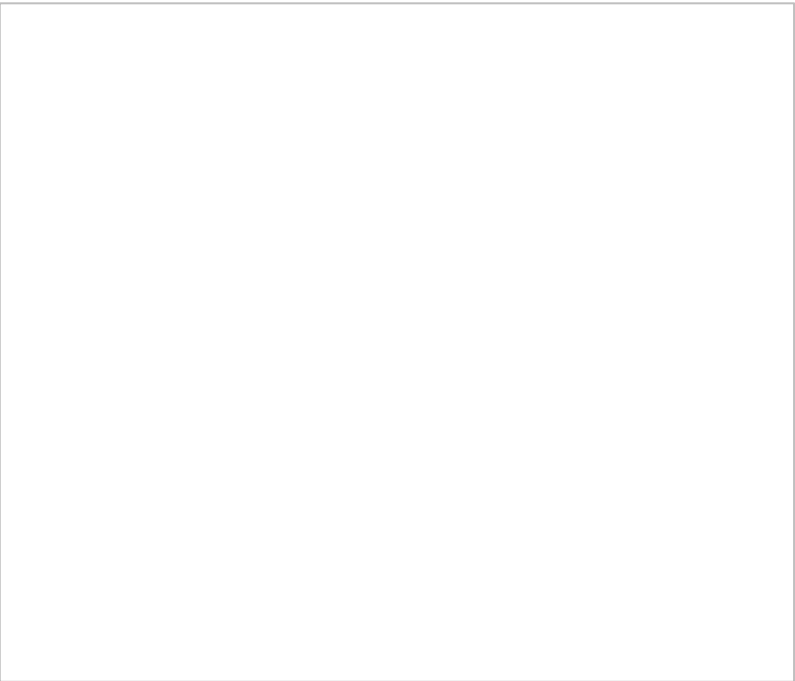
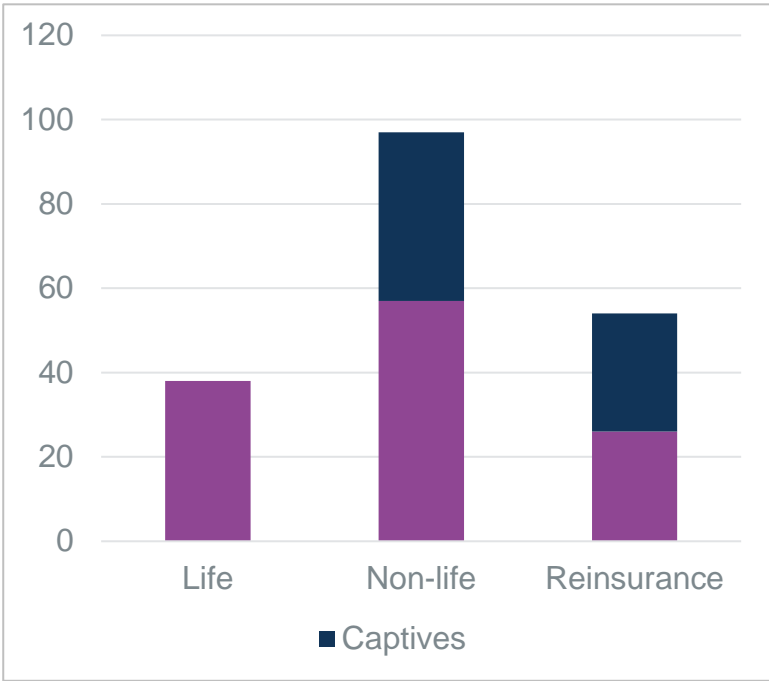
Profile of the Irish insurance sector

With EUR 99bn of gross written premiums in 2021, Ireland hosts the **fourth largest insurance sector in the European Union**. The large majority of Irish insurers are subsidiaries of international groups and often have significant interlinkages with related entities within the same group.

At Q2 2022 there were **189** authorised firms, generating **76%** of their GWP from overseas markets.

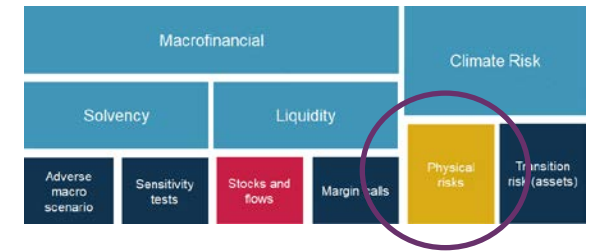
*Compared to EU peers, the Irish insurance sector is large, with assets amounting to almost **120 per cent** of GDP.*

Ireland is home to a diverse set of firms, from the domestically focused to those with multi-national footprints.



Source: IMF; CBI.

Ireland FSAP non-life sector stress test

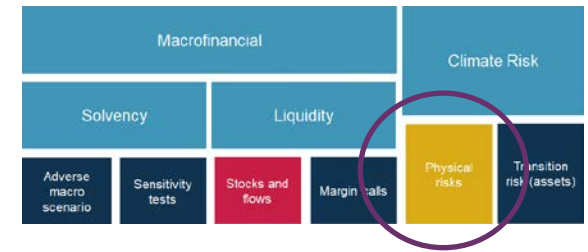


- **Climate physical risks** were assessed with a bottom-up approach in collaboration with firms. 12 firms were in-scope representing > 70% of market GWP
- The analysis used (a) a simulation of **one-time natural catastrophes** and (b) a **parametric approach** which assumes a permanent increase in the frequency and severity of adverse weather events
- **For (a), four disaster events** were simulated to cover meteorological, hydrological and climatological events. The loss impact of these historic scenarios was inflation-adjusted and scaled up by 150 percent.

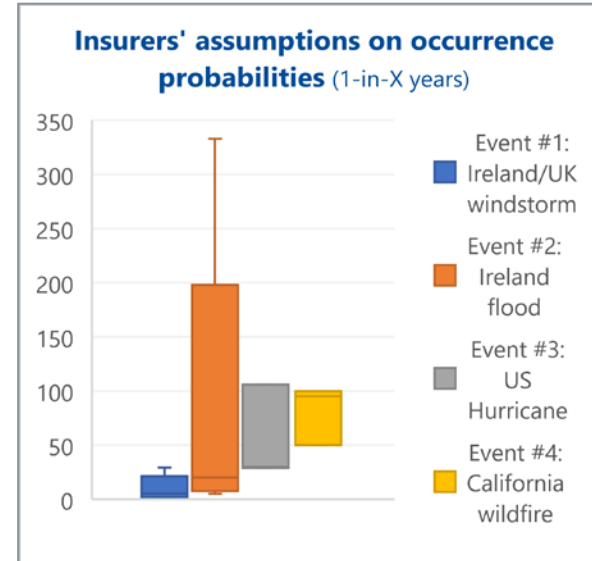
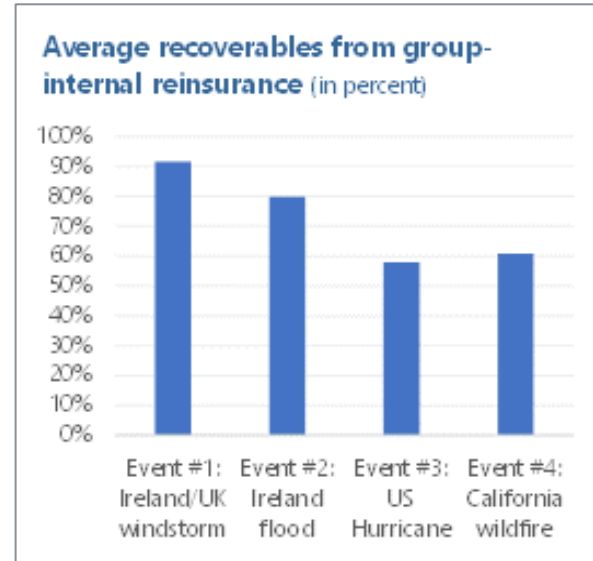
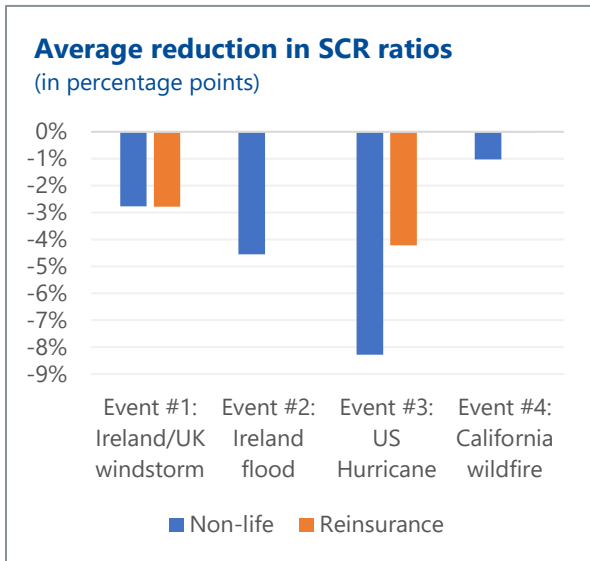
1. **Ireland/UK windstorm:** Storm Darwin, also known as Cyclone Tini (February 2014). This peril would include storm surges in coastal areas.
2. **Ireland flood:** Fluvial and groundwater flooding (November 2009).
3. **(Series of) US hurricanes:** A combination of hurricanes Harvey, Irma, Maria (August-September 2017, making landfall in Texas, Puerto Rico and Florida).
4. **California wildfire:** Camp Fire (November 2018, Northern California).



Ireland FSAP non-life sector stress test



- Even large natural catastrophes, when seen in isolation, would likely not have a pronounced impact on insurers' solvency levels. For example, while the payouts following a major windstorm in Ireland and the UK would result in gross claims of around €550m and net claim payments (i.e. after reinsurance) of around €140m, the impact would be seen mostly in profits, while the SCR ratios would decline by less than 3 percentage points, on average
- Irish insurers are relying to a very large degree on group-internal reinsurance for the most relevant natural disasters
- Modelling of domestic Irish flood risk is very diverse, and (re)insurers' assumptions on the occurrence probability of the simulated flood event vary significantly.



“Large domestic loss events have been rare in recent years, instead smaller and medium-size events are quite frequent. This limitation on historic data complicates loss modeling of extreme events, particularly for Irish flood risk, where participants in the bottom-up stress test used very different assumptions for the occurrence probability of the scenario.”

IMF November 2022

But there are alternative views!

- *“The calculation of a post-stress SCR is not necessary to achieve EIOPA’s financial stability mandate and given that Solvency II is already a stress-test based framework it would result in a stress on a stress and would wrongly imply capital needs far in excess of the 1 in 200. Publication of post-stress SCR, even on an aggregate basis, would create significant confusion and must be avoided.”* (Insurance Europe, 2020)
- *“EU-wide, standardised liquidity stress tests are not expected to provide significant additional value or insights to the data which is already available to supervisors and regulators.”* (Insurance Europe, 2020)
- *“Insurance Europe takes the view that multi-period stress tests are too complicated and costly to be taken forward.”* (Insurance Europe, 2020)
- *“A lack of coordination and harmonization across supervisory stress tests has reduced quality and increased costs for both supervisors and banks. What specific steps can be taken to inject more common sense and order into the world of stress testing?”* (Global Association of Risk Professionals, 2019)

Some observations....

1

Industry stress tests can add real value as a supervisory tool - but avoid “going through the motions”

2

They are resource intensive for all parties and need to be used judiciously and have clear objectives

3

For Ireland, EIOPA stress test capabilities and material can be leveraged, but tailoring is required

4

This is an evolving field with many new avenues to explore, and we collectively learn by doing

5

How a firm engages in an exercise can tell a wider story



Questions

Comments

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

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