

# Climate Scenarios

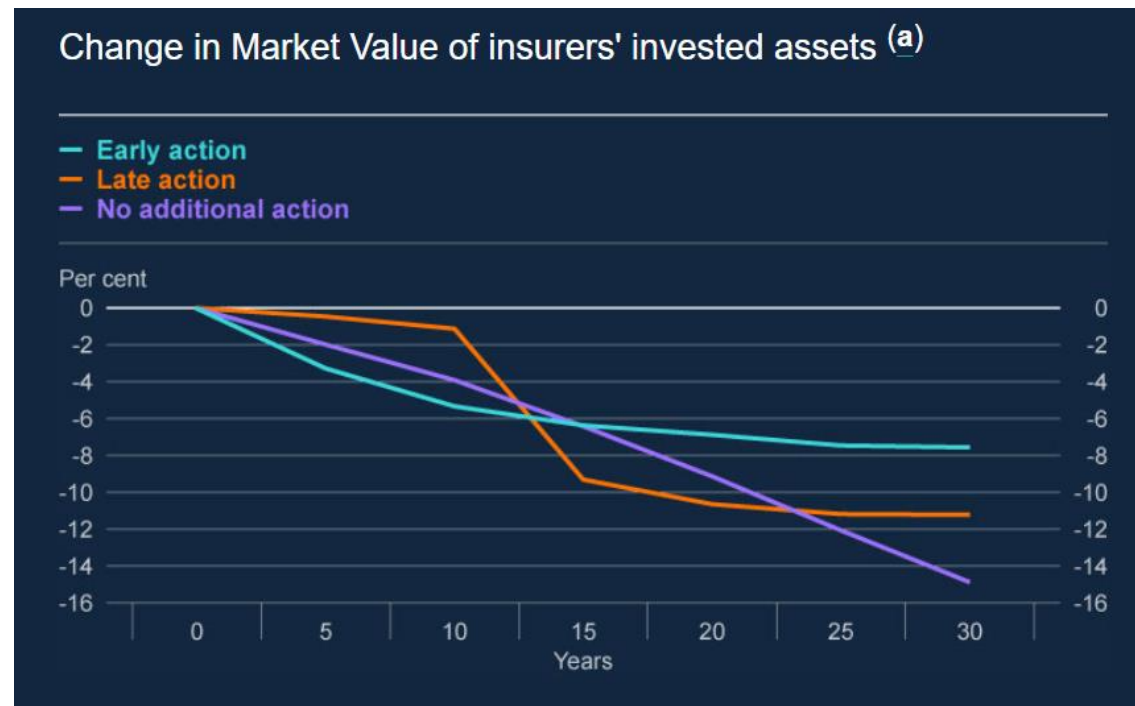


# Agenda

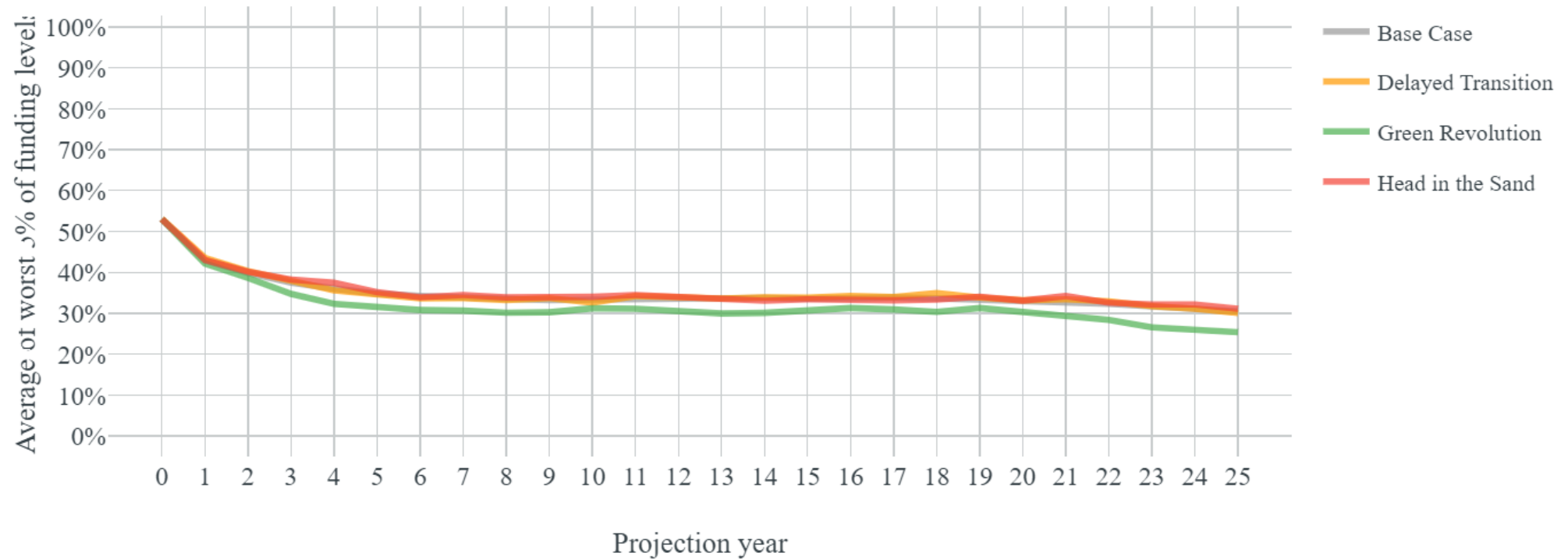
- 1** The problem: current scenarios omit risks
- 2** The solution: how can climate scenarios better capture the risks?
- 3** Some frameworks we've found useful
- 4** Brainstormed scenarios
- 5** Food shock

# Current climate scenarios

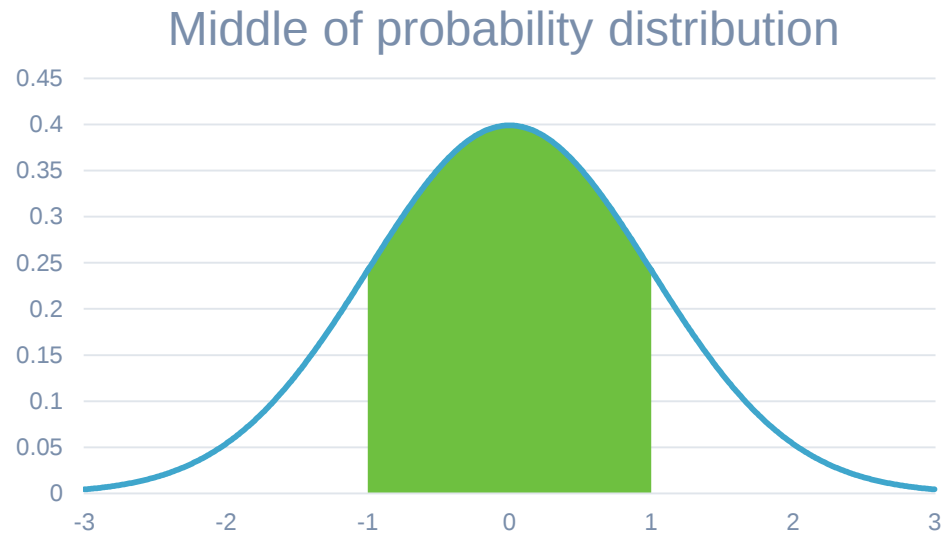
# Climate scenario results do not appear extreme



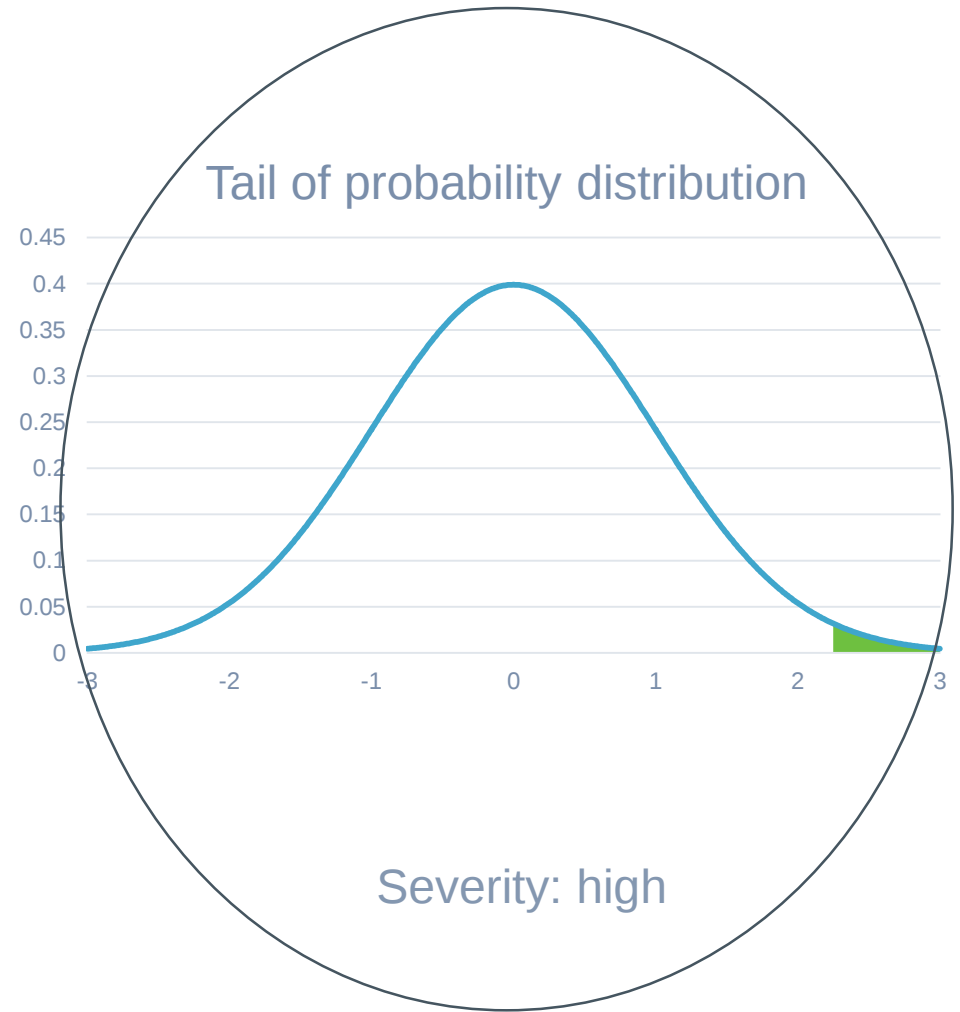
# Climate results often don't differ much from base



# Focus on the middle or tail of distribution?

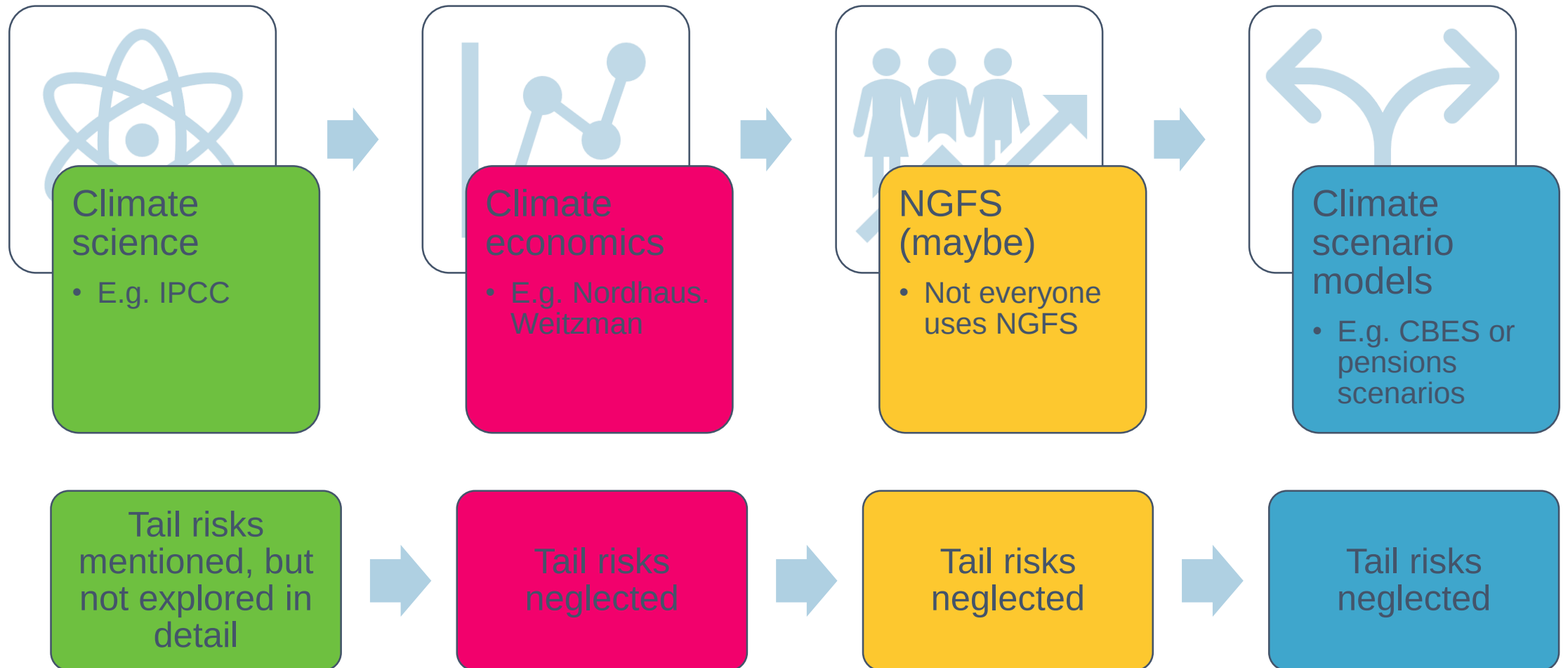


Severity: moderate



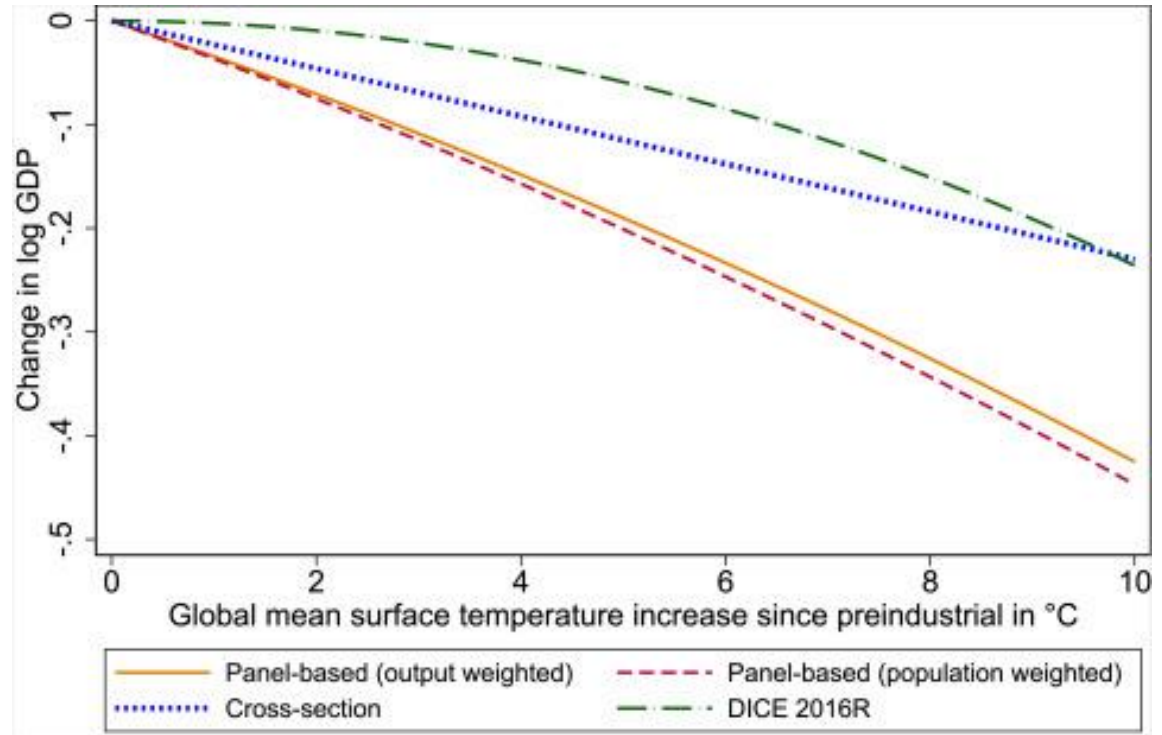
Severity: high

# Why are tail risks neglected?



# Kalkuhl & Wenz 2020

- Looks at the **correlation** between annual temperature shocks / long-run temperature levels and GDP (or technically it's the regional equivalent, GRP)
- [The impact of climate conditions on economic production. Evidence from a global panel of regions – ScienceDirect](#)



# Extreme events are excluded

“Note that these effects capture productivity impacts (labor and land productivity, capital depreciation) related to changes in annual temperature. Therefore, non-market effects as well as **effects from extreme events**, sea-level rise or indirectly related societal dynamics like migration or conflicts **are not included in those estimates.**”

Source: p29 of NGFS technical paper, emphasis added



Press release



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## Current climate scenario analysis exercises may understate climate exposures and vulnerabilities, warn FSB and NGFS

The Financial Stability Board (FSB) and Network for Greening the Financial System (NGFS) published today a joint report outlining initial findings from climate scenario analyses undertaken by financial authorities to assess climate-related financial risks. The report draws lessons for effective scenario analysis and sketches out a global perspective. It has been sent to G20 Leaders ahead of the Bali Summit.

The report provides a synthesis of the findings from climate scenario analysis exercises undertaken by financial authorities at the individual firm level, at the level of the different financial sectors, and at the overall financial system level. It builds on the NGFS Scenarios in action progress report as an attempt to evaluate the implications of climate-change-related developments for the financial system as depicted in climate scenarios.

The report finds that the NGFS Scenarios play a critical role in providing reference climate macro-financial scenarios and supporting financial authorities' climate scenario analysis exercises. While a majority of these exercises rely on NGFS scenarios, significant variations in scope and objectives make it difficult to allow a straightforward comparison of results. However, taken together, the exercises provide a comprehensive picture on vulnerabilities. The overarching message from these initial exercises for financial stability is that, while the impacts of climate risks are not small, they seem to be concentrated in some sectors and overall, at least at this juncture and as currently assessed, contained from the perspective of domestic financial systems.

However, the report notes that tail risks and spill overs associated with climate change related developments may not be as manageable. In addition, measures of exposure and vulnerability are likely understated. Many exercises do not capture second-round effects, potential non-linearities in climate-related risks, and other potentially large sources of risk, such as those stemming from an abrupt correction in asset prices when transition shocks result in fire sales of assets in exposed sectors.

The report also finds that scenario analysis exercises at this stage are usefully feeding into policy discussions and are raising awareness. While critically contributing to risk assessment, the exercises are still considered exploratory and in most cases do not translate into micro- or macro-prudential policy action at this stage. Further progress on bridging data gaps, particularly on improving data availability and consistency/comparability at the global level, will be key. The report calls for greater cross-border cooperation – particularly at this early stage

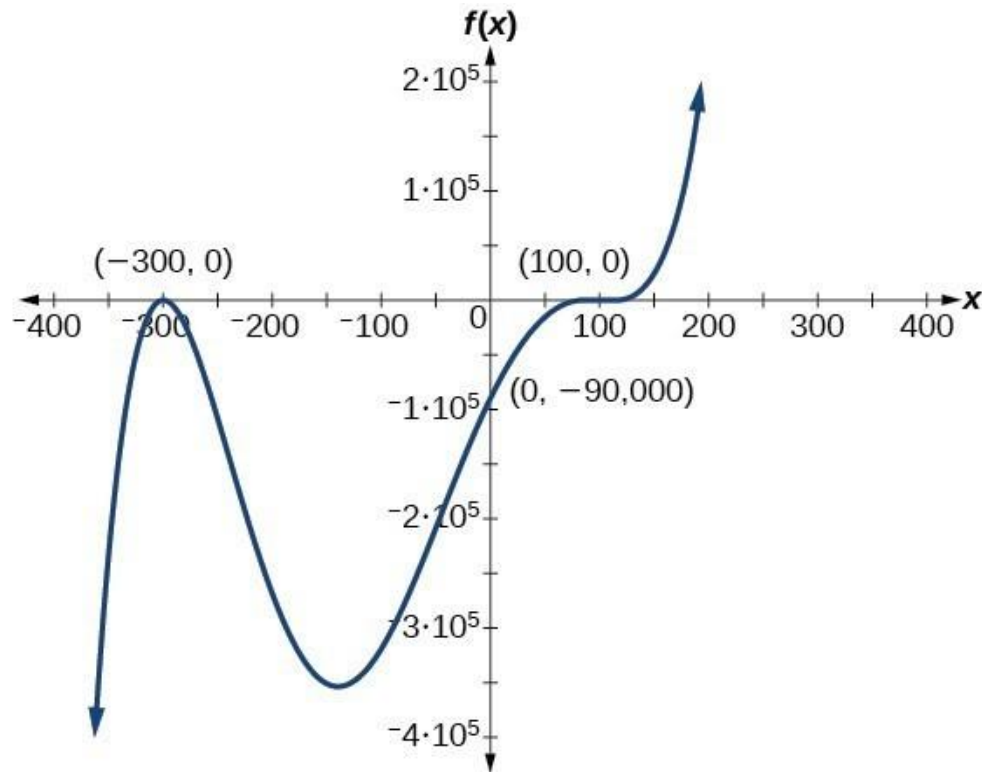
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The solution



# Distinction between abstract and concrete scenarios

- Abstract

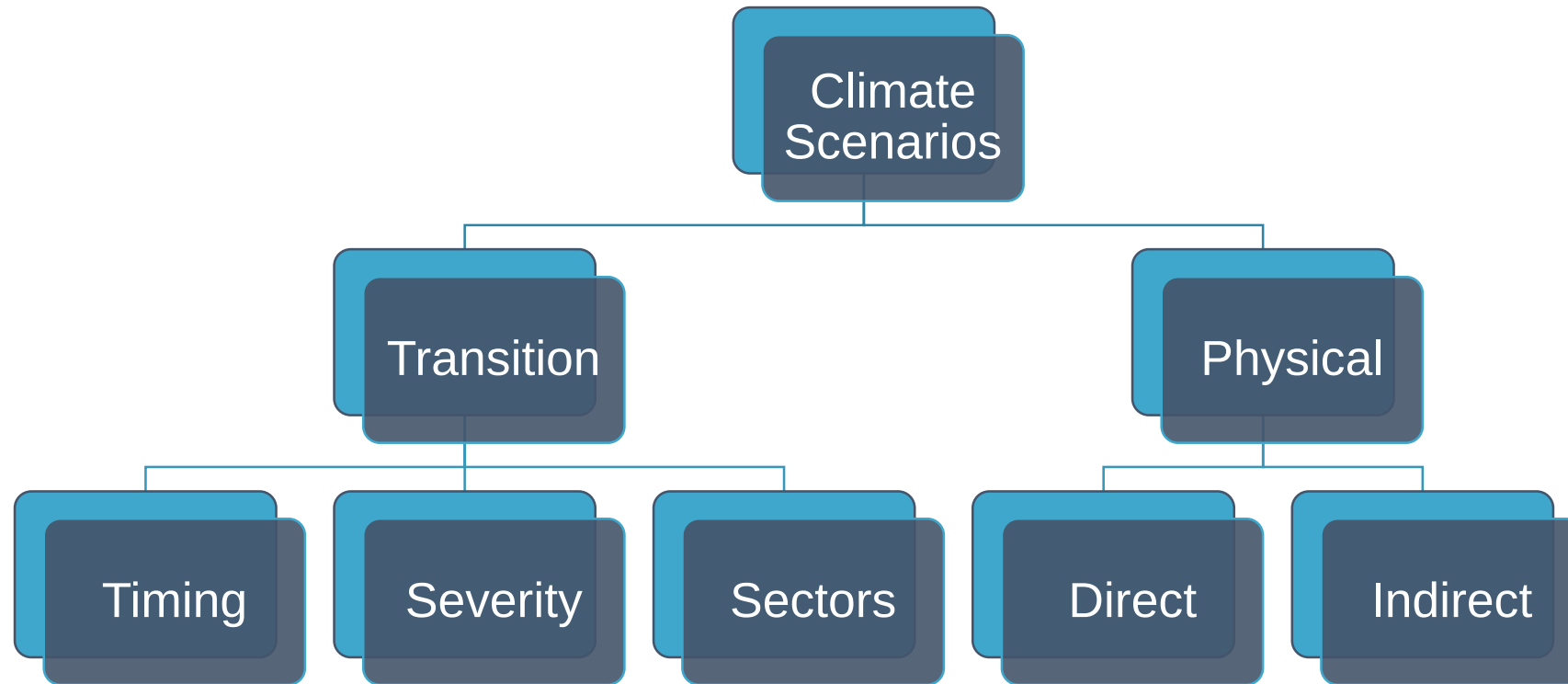


- Concrete

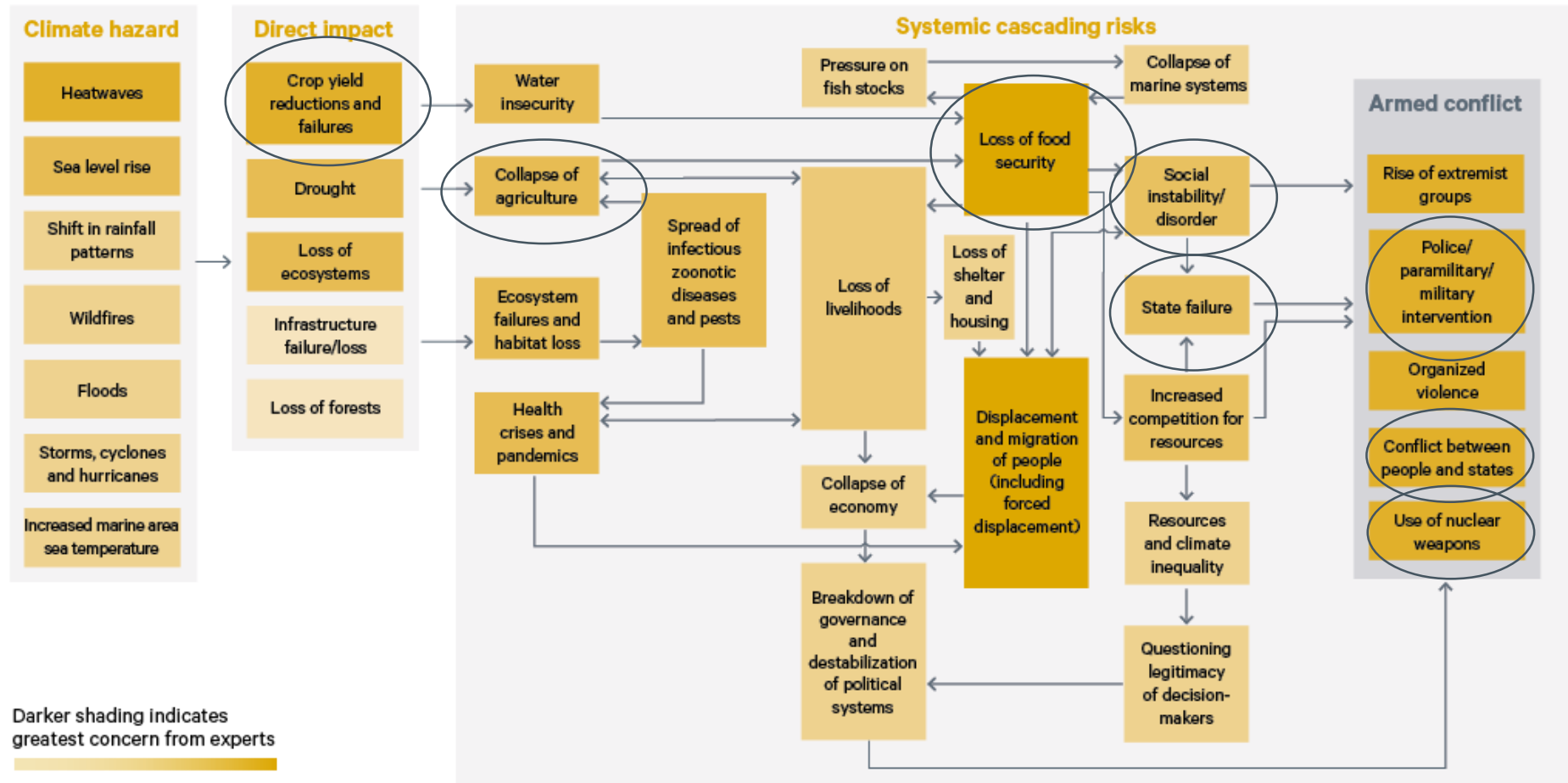


# Some useful frameworks

# Climate scenario generation framework



# Climate change could lead to systemic cascading risks



Source:  
Chatham  
House:  
Climate  
change risk  
assessment  
2021

# Five dimensions

**Environmental severity and feedbacks**

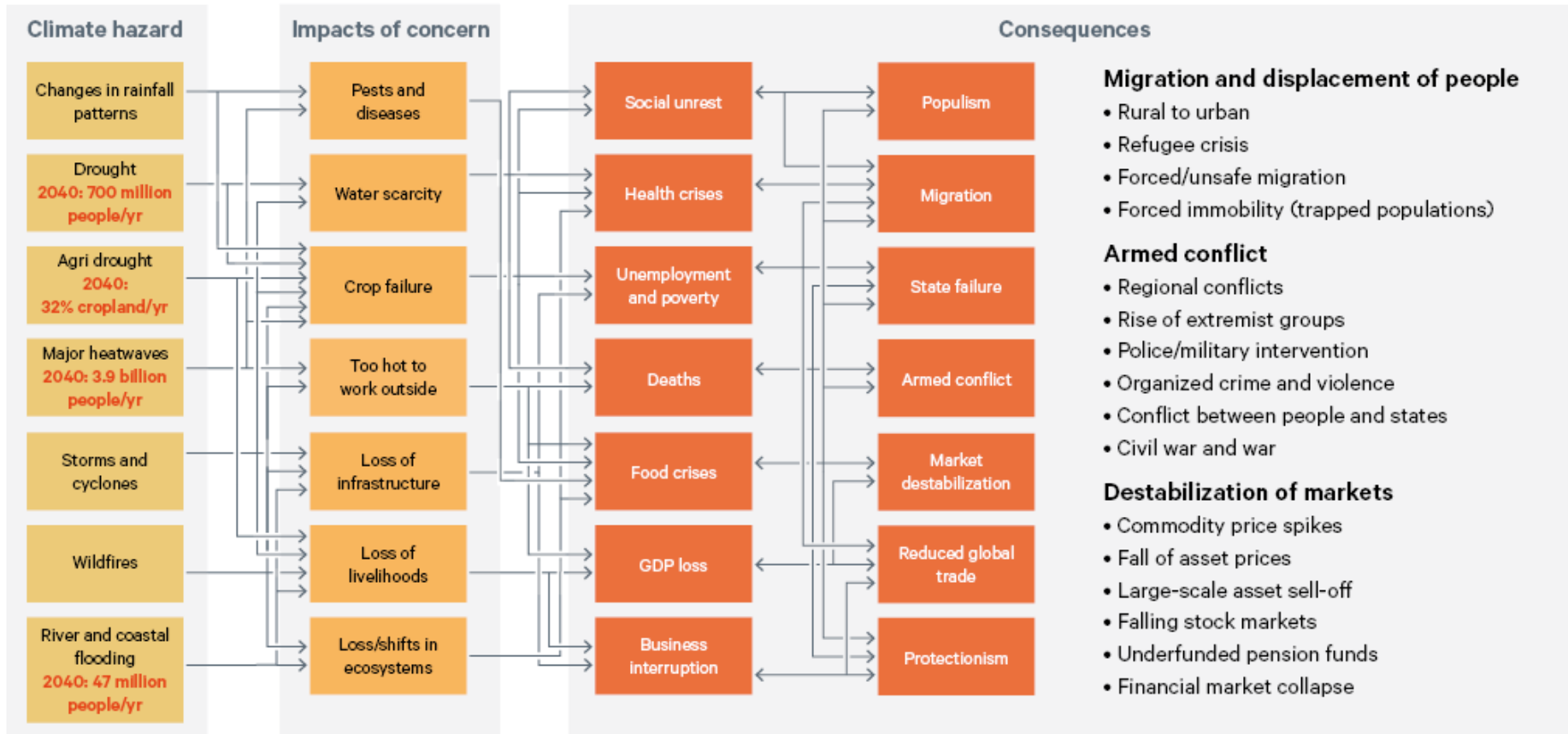
**Energy systems**

**Technology progression**

**Social policies, adaptation and response**

**Geopolitical tensions and developments**

# Risk dynamics based on expert elicitation



Source:  
Chatham  
House:  
Climate  
change risk  
assessment  
2021

# Example scenarios



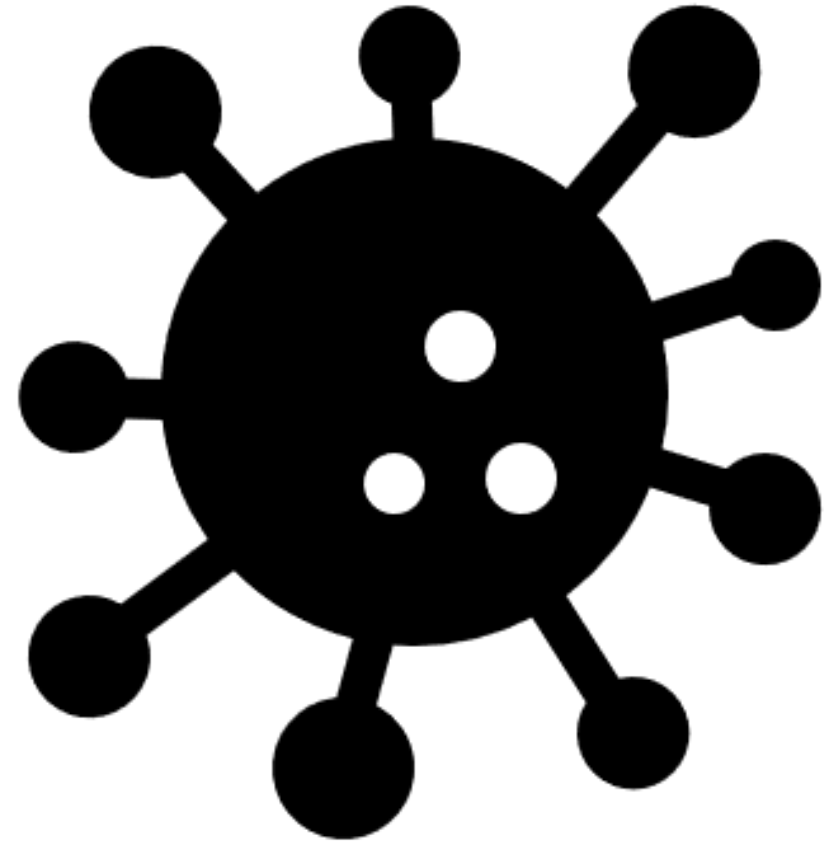
# Brainstormed examples of tail risk scenarios

- **Early transition: Disorderly transition in 2025**
- Pandemic: Climate change → wildfires → deforestation → ecological dislocations → pandemic
- Semiconductors: Climate change → extreme weather → disaster which hits Taiwan → impact on semiconductor market → macroeconomic implications
- Ganges water: Climate change → loss of Himalayan glaciers → reduction in water supply in India
- Food systems: Climate change → agricultural productivity → food price shocks → (trade?) war



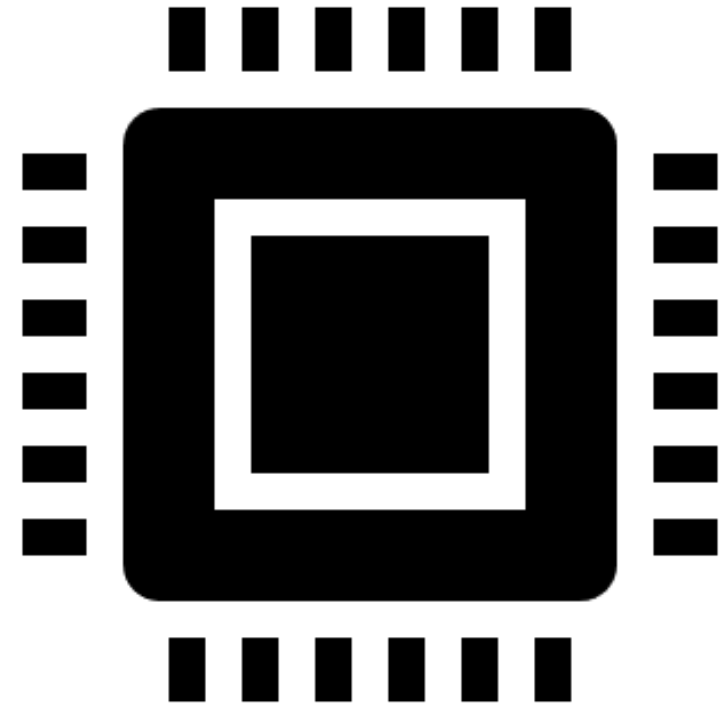
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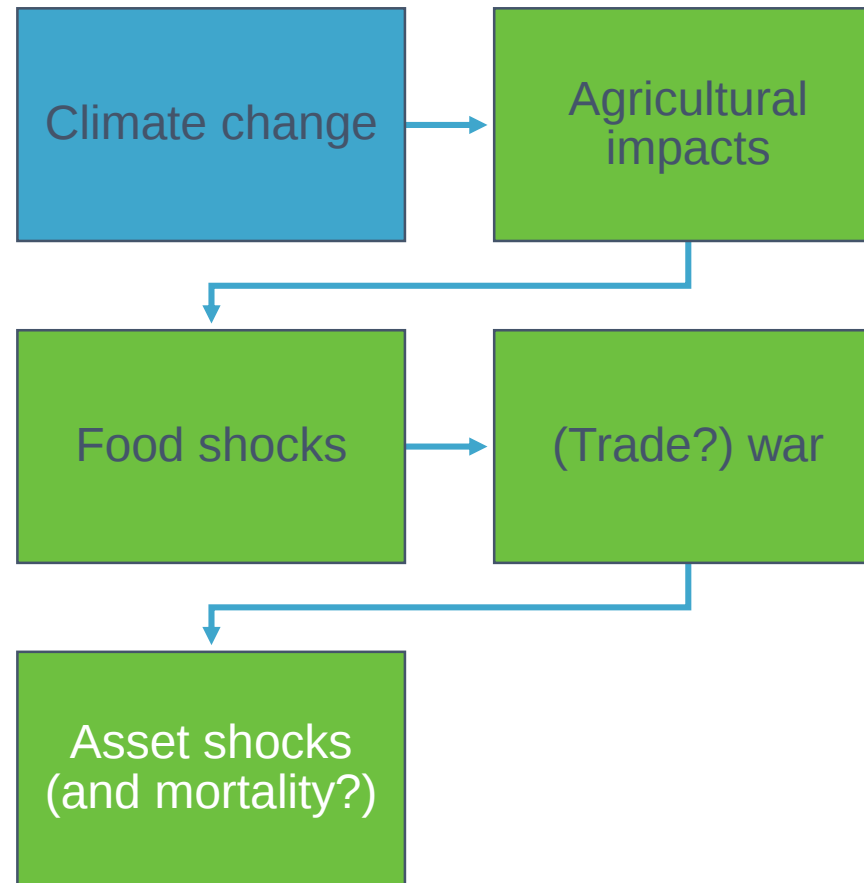


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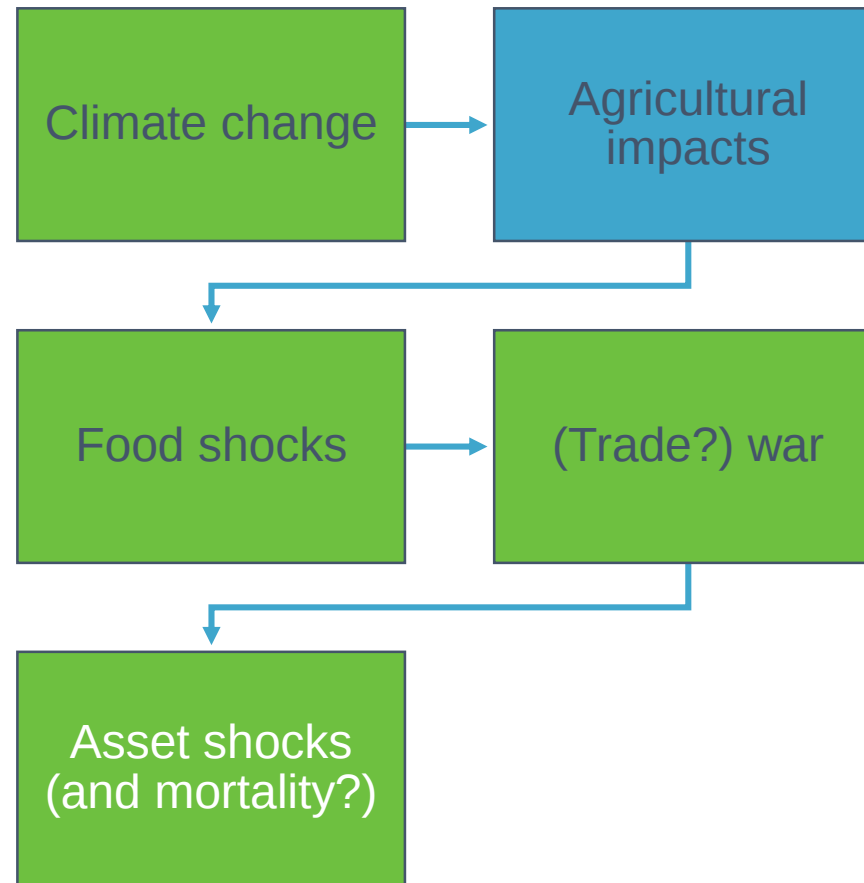
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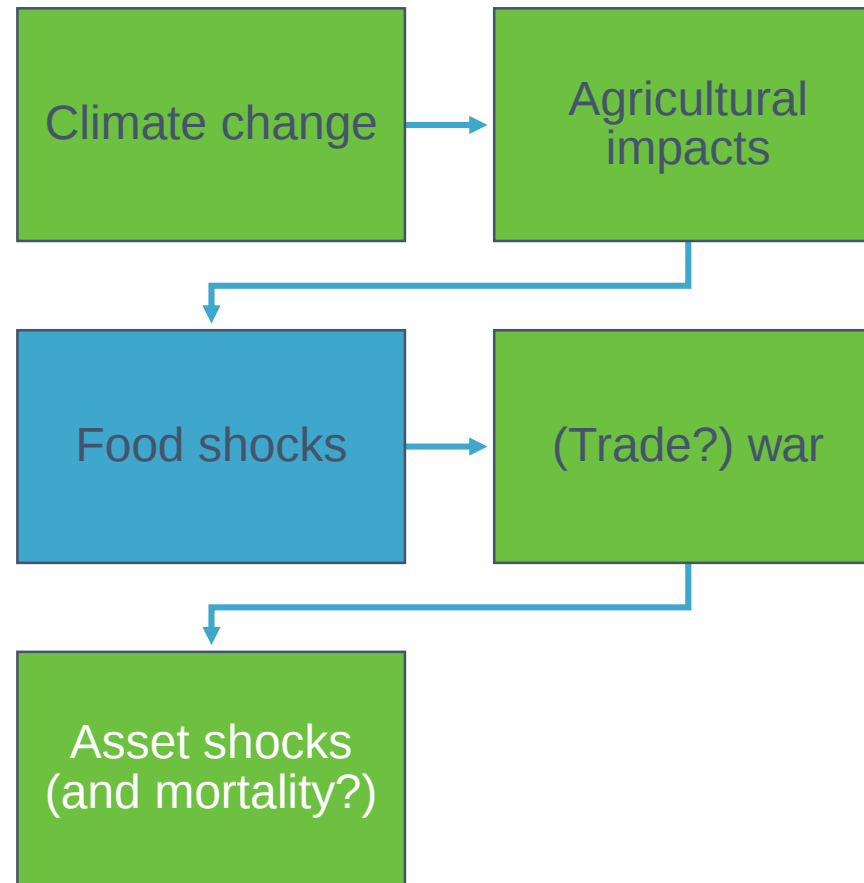
# Climate and food: an example scenario



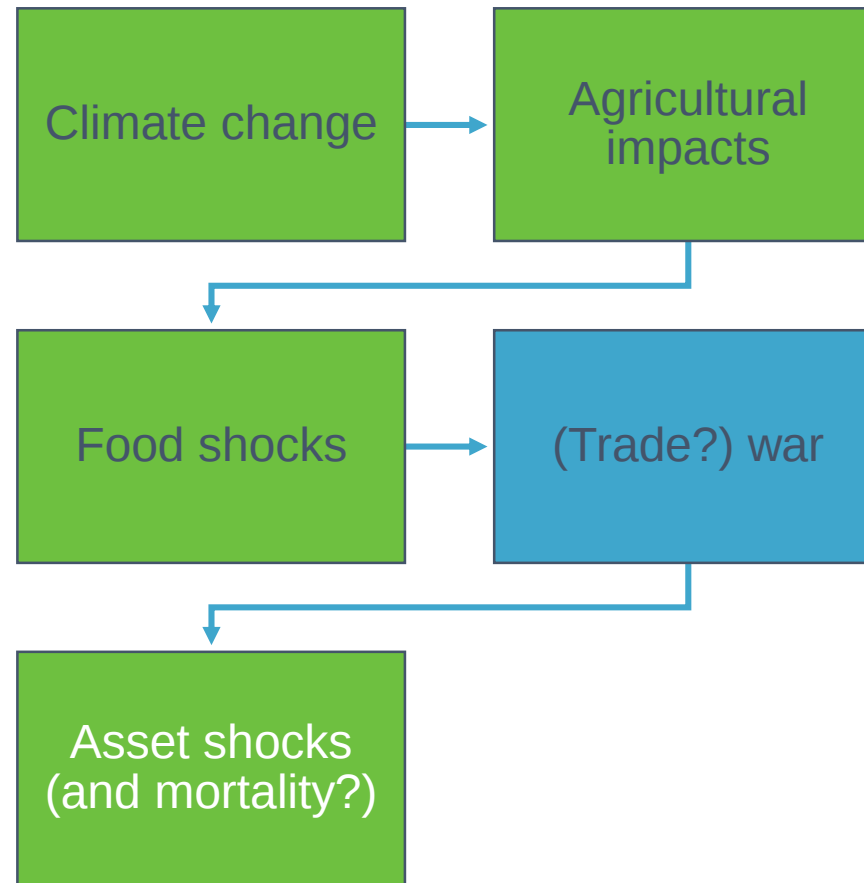
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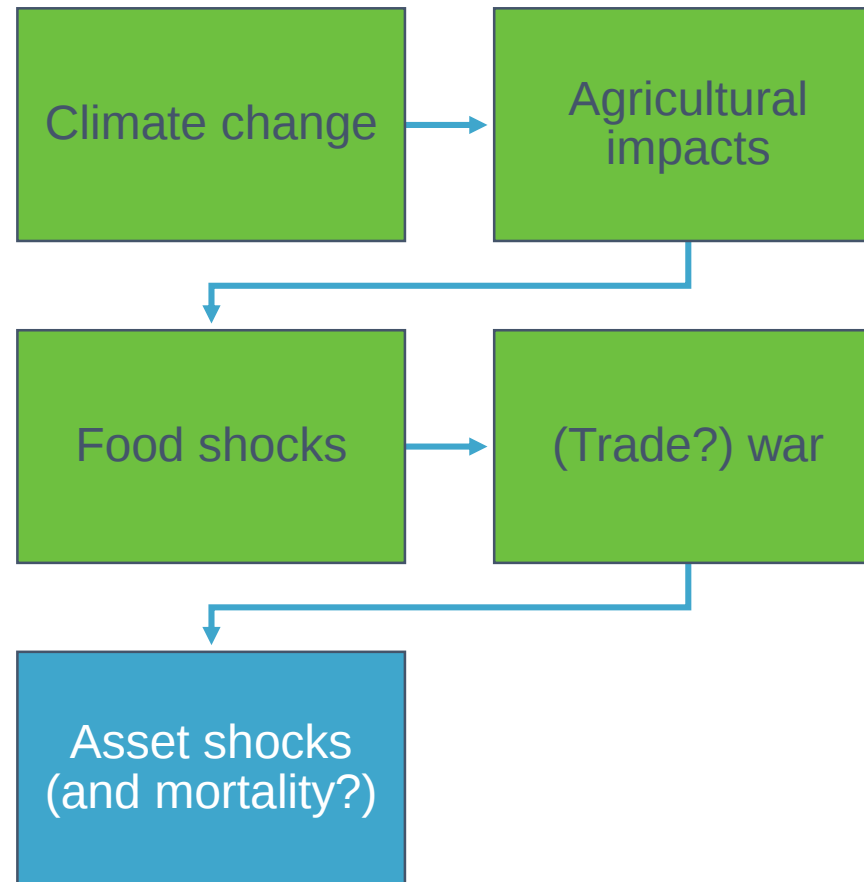
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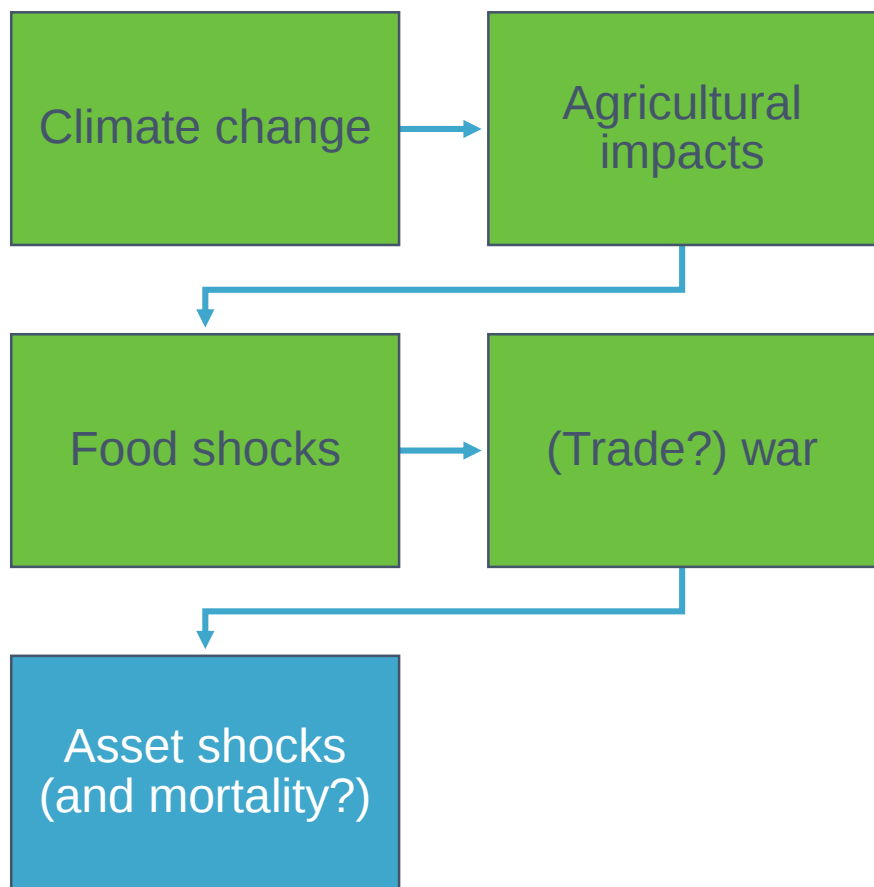
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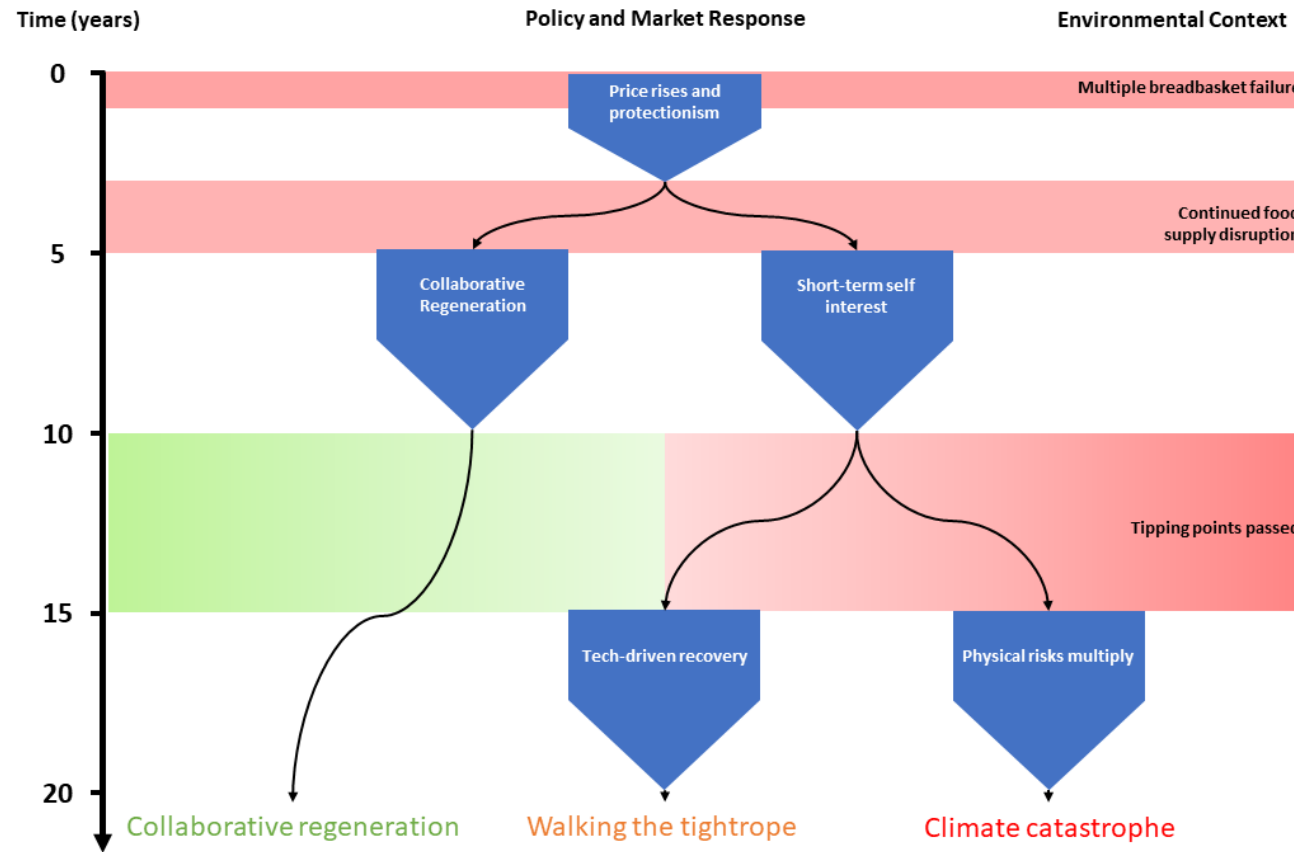


# Trade war, but no actual conflict



- Magnitude of drop in equities could be 20%
- Exposures most likely to be in certain specific countries, the risk being driven by the dynamics of how trade tensions might develop
- Trade wars could develop to cover almost any product, especially in scenarios serious enough to weaken WTO rules; sectors which are particularly import-dependent would be particularly exposed

# Post-food-shock pathways



# Thank you

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