

# Resilience and Monetary Policy

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**Monetärer Workshop**

Online, 2024-12-06



# Resilience vs. Robustness Approach

- **Resilience** approach

- test waters, take risk
- reacts on new info, latest when **bouncing back** is in danger



the reed

**Volatility  
Paradox**

- **Robustness** approach

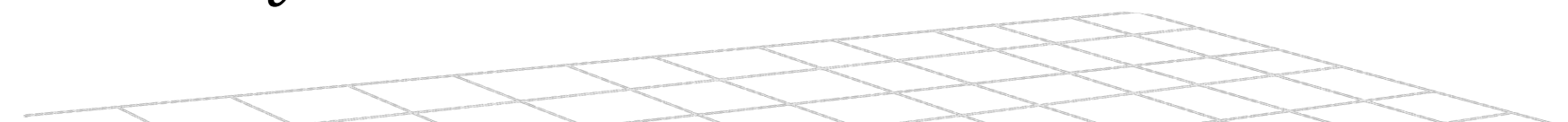
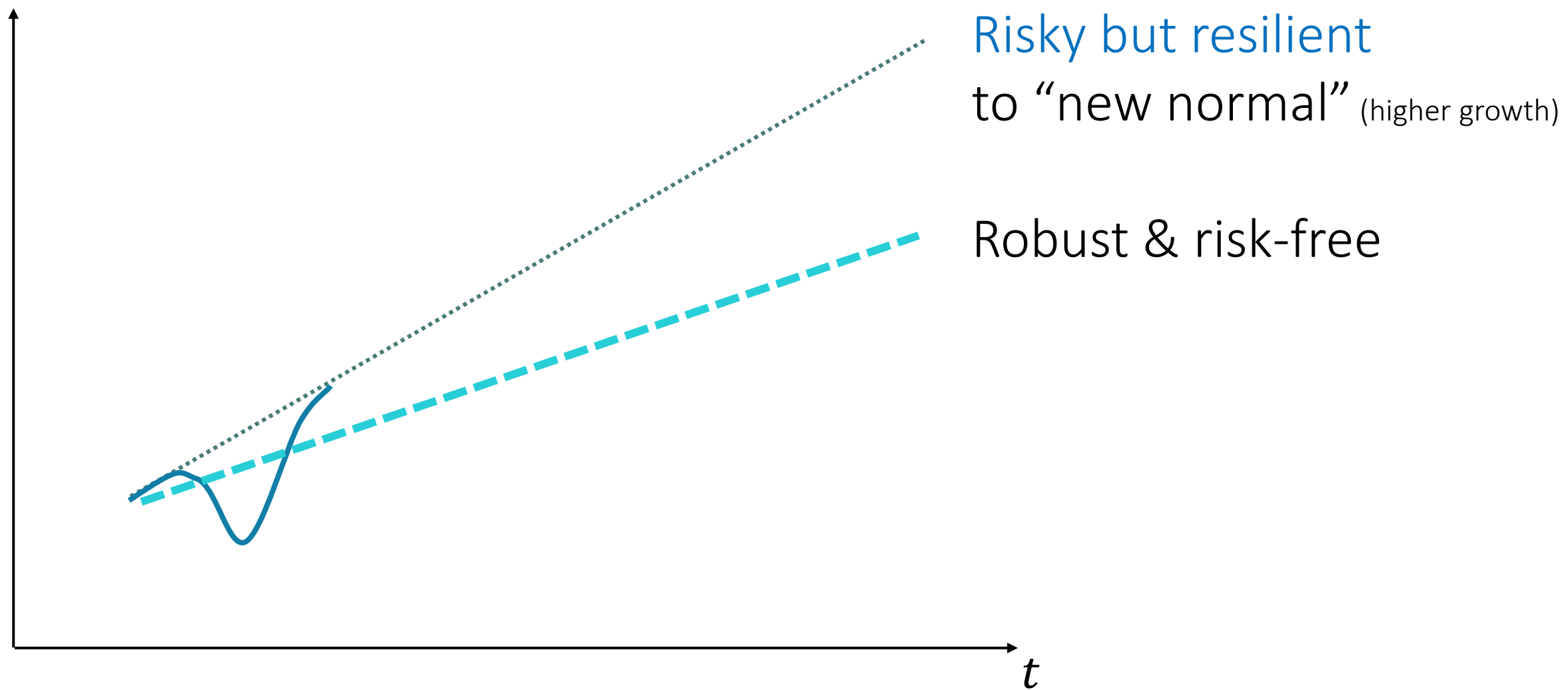
- works in most (incl. “worst”) circumstances
- reaction mostly not needed, autopilot, limited/coarse conditioning, **rigid rules**



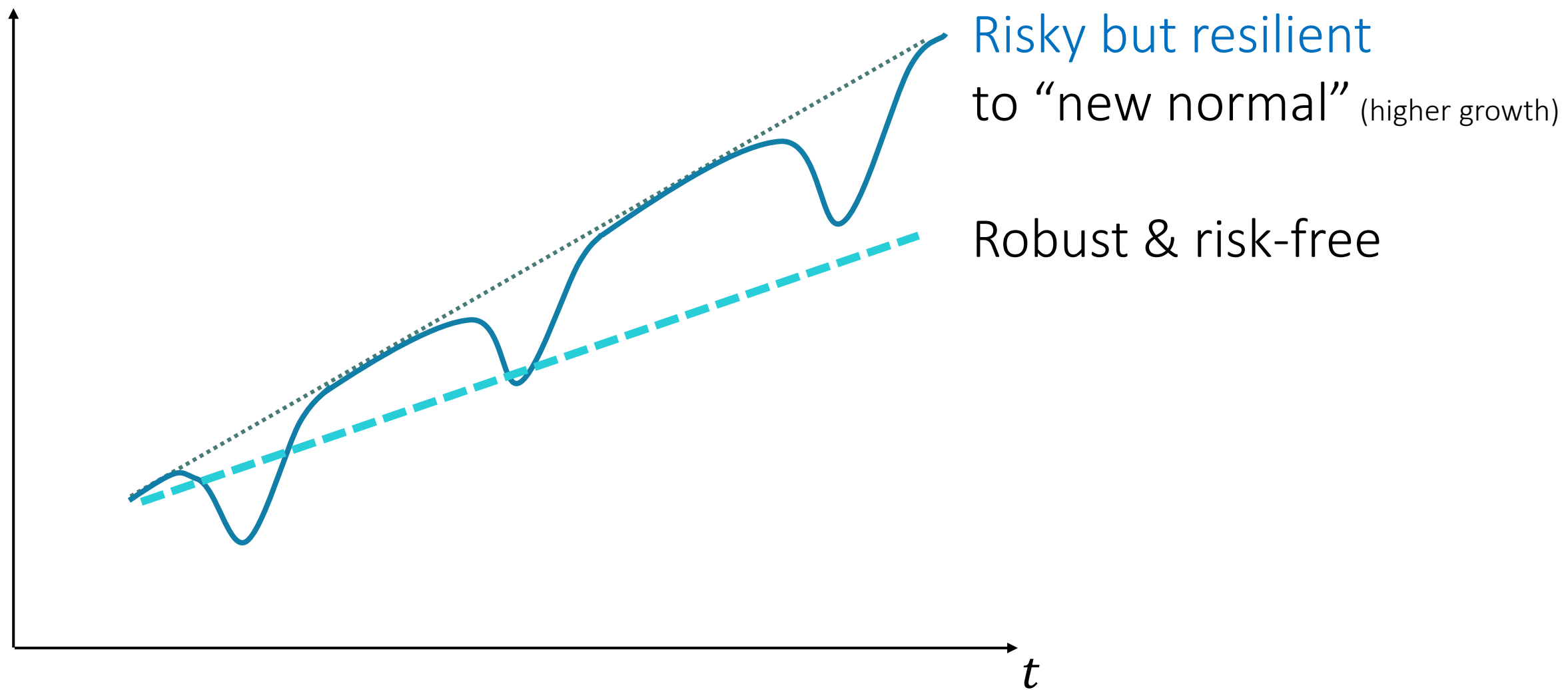
the oak

Rigidity ≠ stability

# Resilient Path

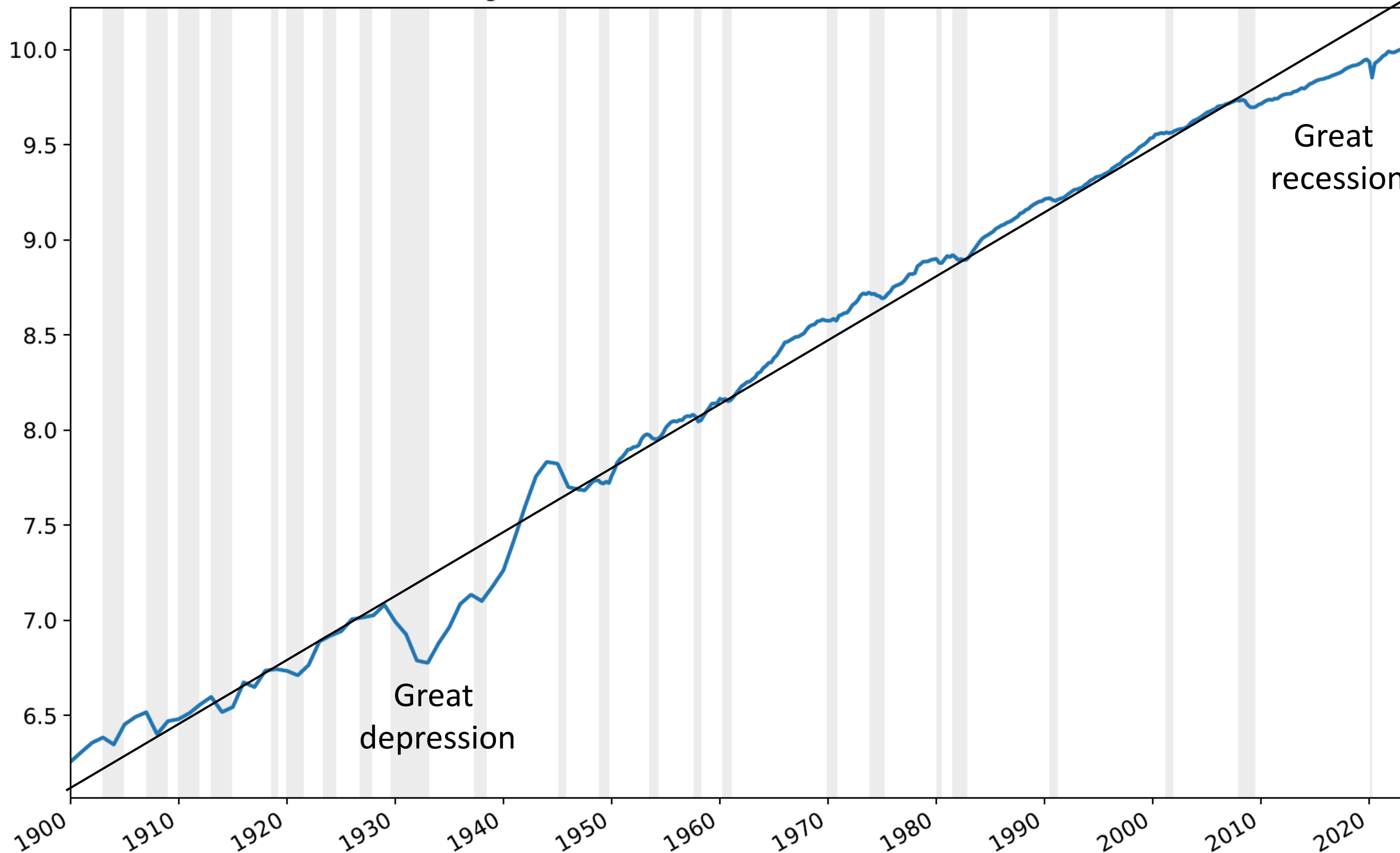


# Resilient Path



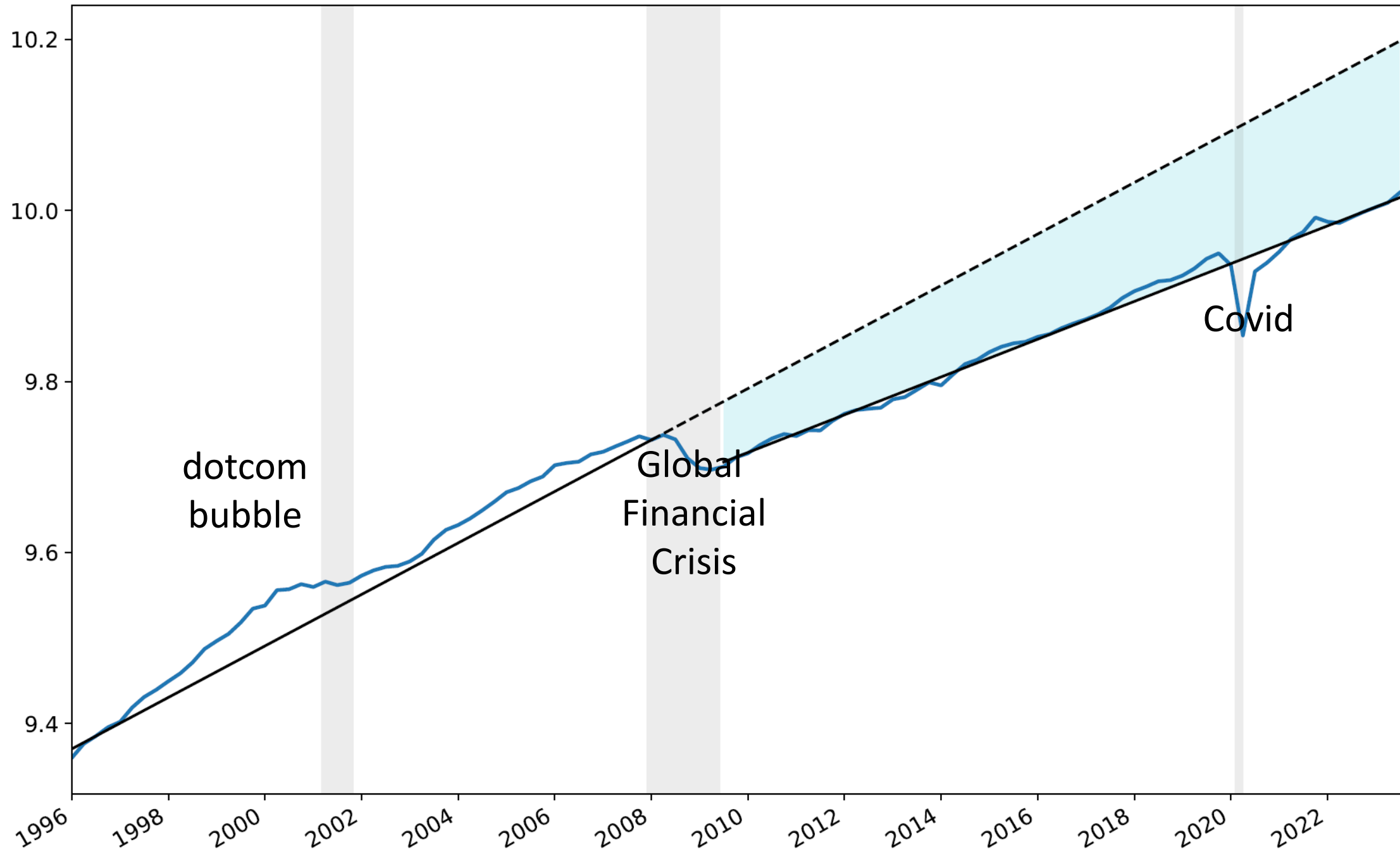
# Real US GDP in log scale: Financial Crises as Resilience Killers

Logarithm of US Real GDP (millions of 2017 dollars)



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Logarithm of US Real GDP (millions of 2017 dollars)



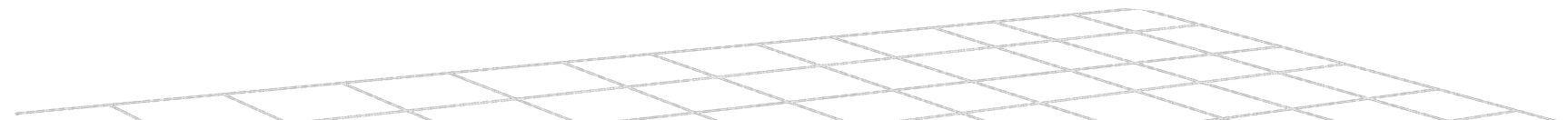
- Gap in 2023 alone  
≈ \$3-4 trillion (\$26 minus \$22)

- Gap over the years  
≈ shaded area

- Non-resilience matters in
  - Levels
  - Growth rates

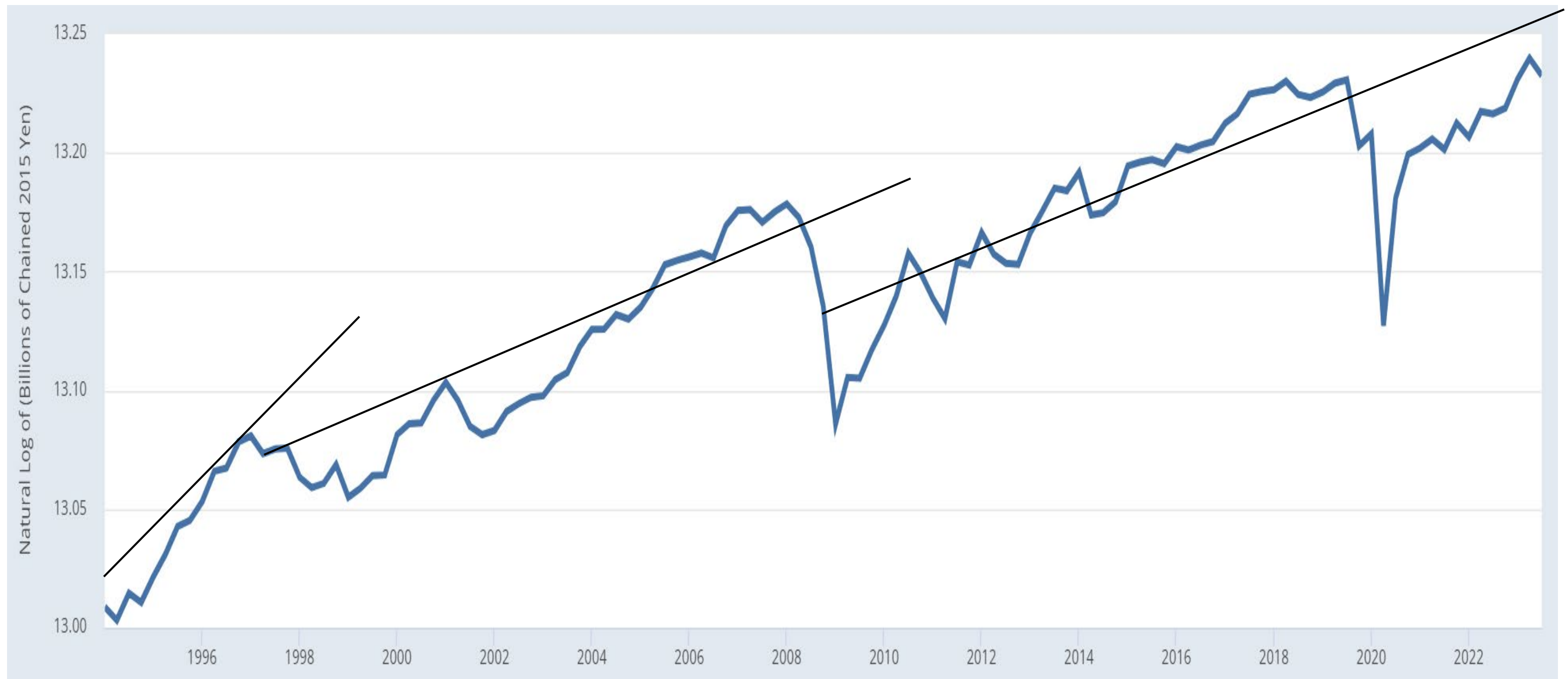
- After financial crises

- Long-run Risk = non-resilience in growth rates



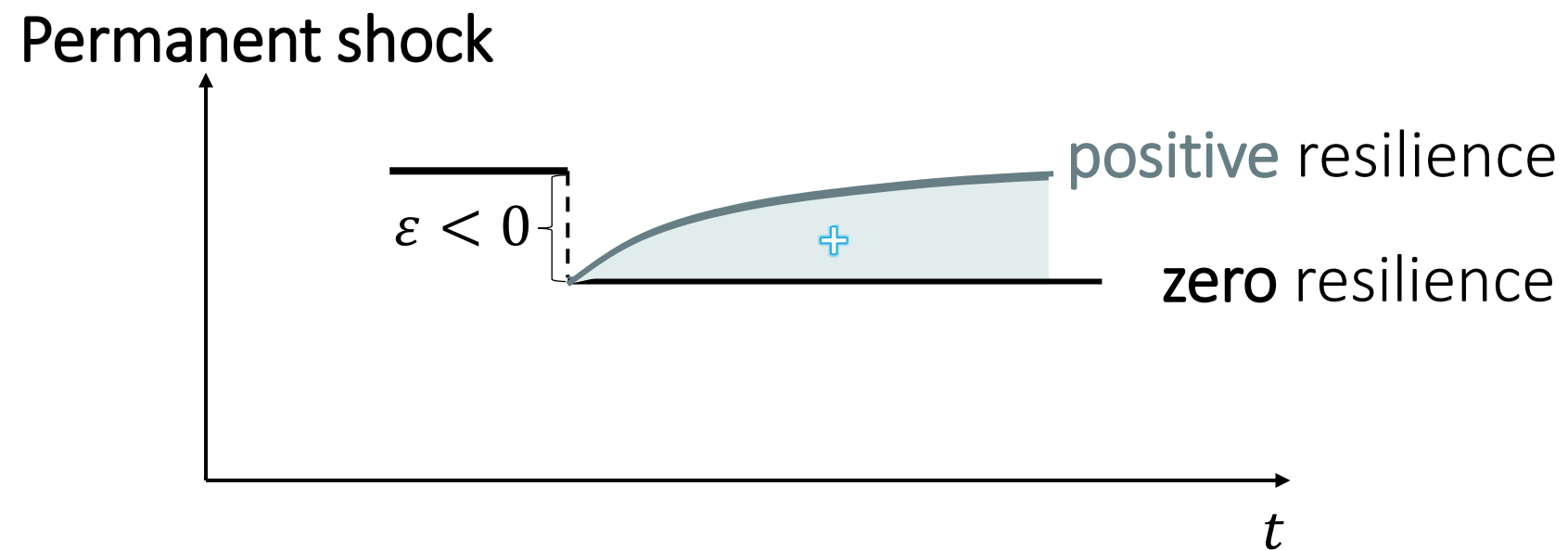
# Real Japanese GDP in log scale

- Japanese GDP
  - Lack of resilience after financial crisis, resilience after Fukushima

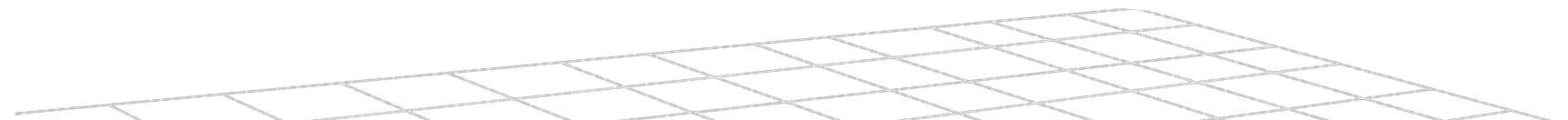


# Resilience due to Adaptation/Adjustment

- Resilience can be
  - *positive* - adaptation leads to **bounce back** or



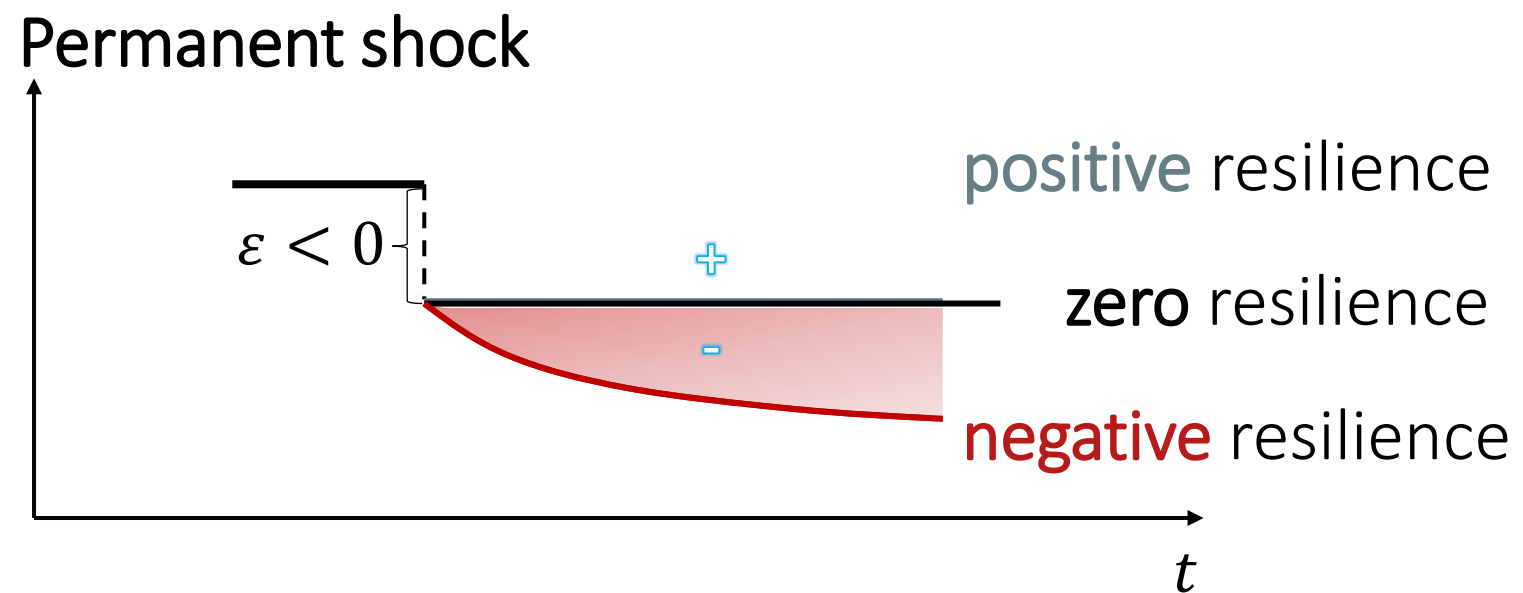
- **$\mathcal{R}$ -Measure: PV of “adaptability benefits”**
  - Zero-Benchmark: process absent any adaptability
    - Relative Resilience: relative to less adaptable system (e.g. one-time least costly adjustment)





# Resilience due to Adaptation/Adjustment

- Resilience can be
  - *positive* - adaptation leads to bounce back or
  - *negative* - adaptation leads to **divergence**



# Next, ...

- Resilience inhibitors
- Resilience enhancers

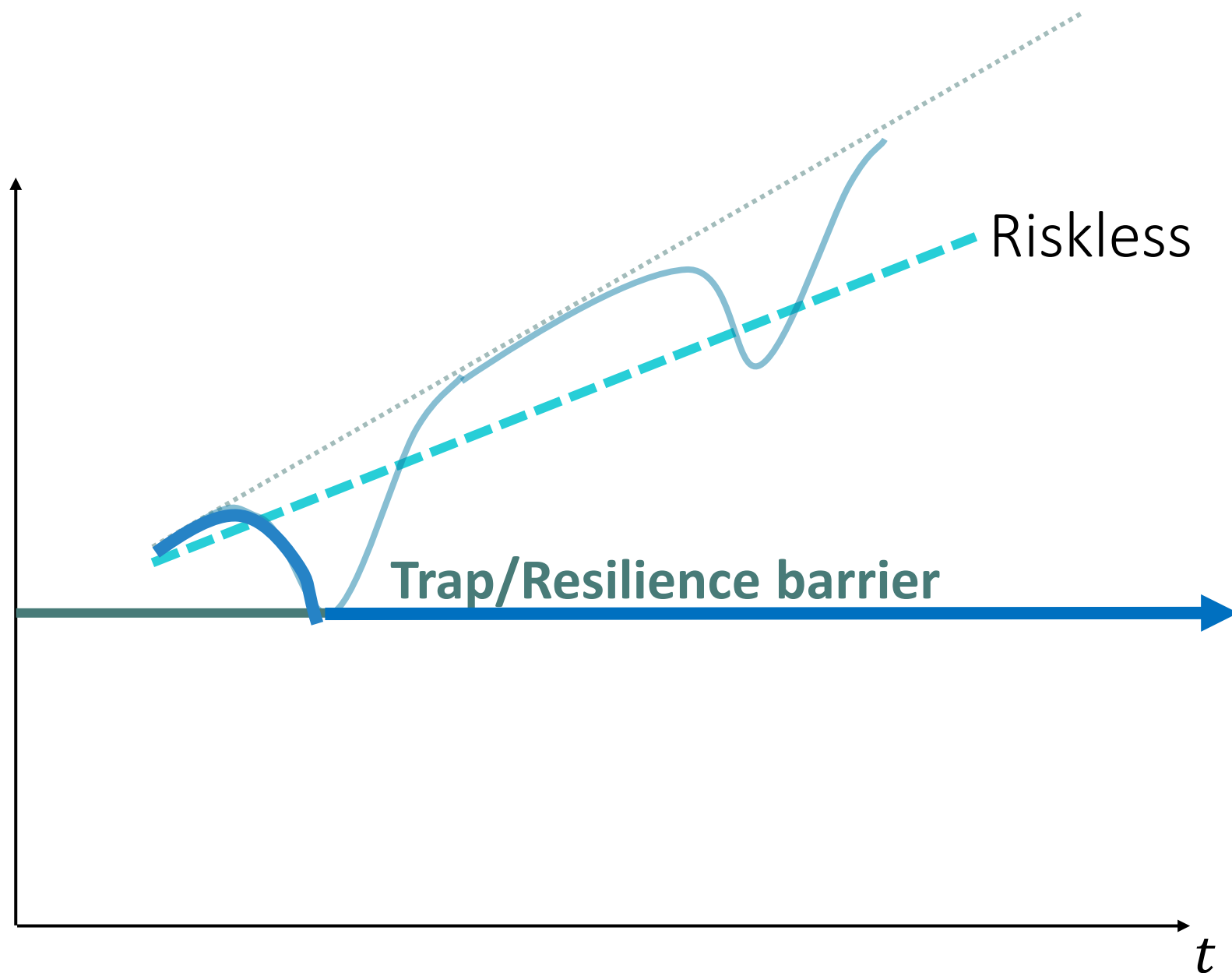


# Resilience Inhibitors

path dependencies, “points of no return”

- **Traps** = “no bouncing back”
  - Requires ex-ante thinking

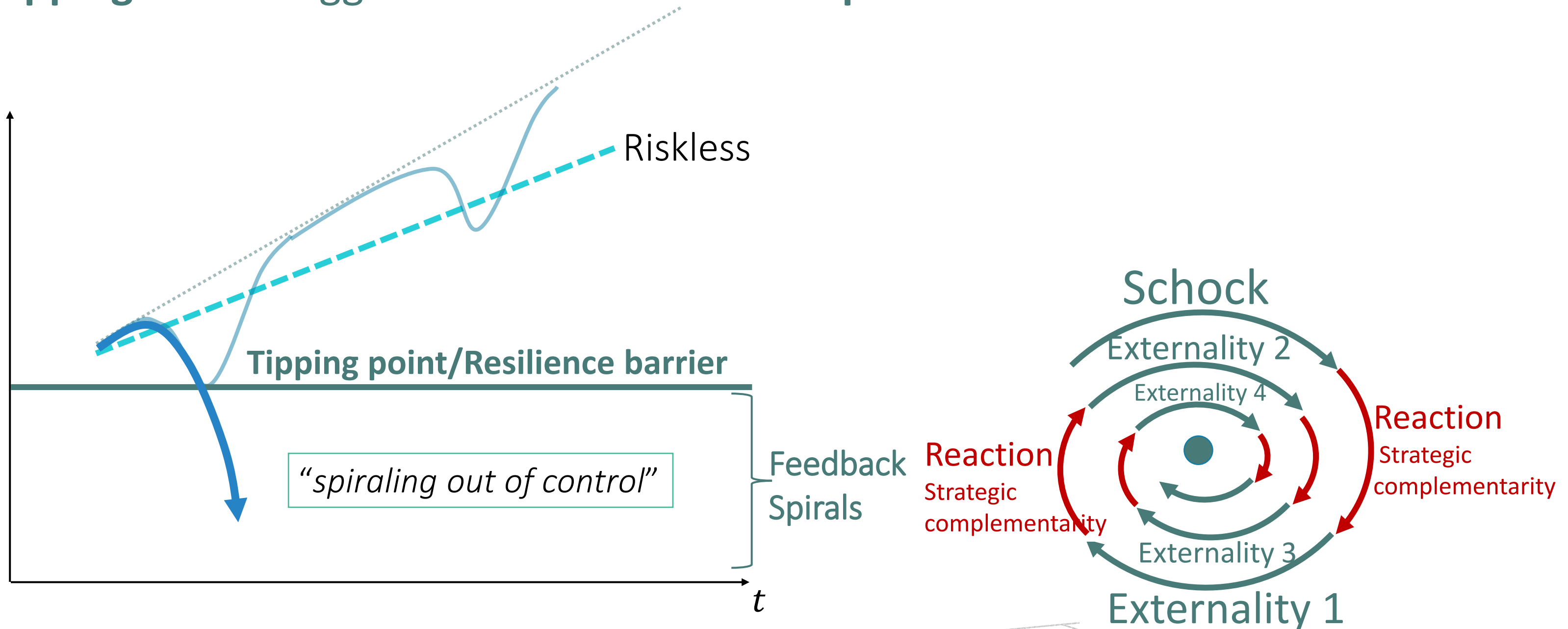
Hysteresis, scarring



# Resilience Inhibitors

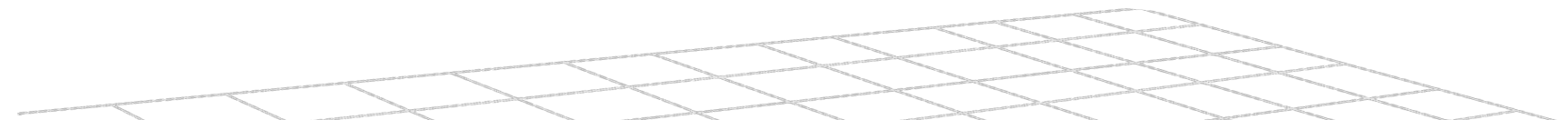
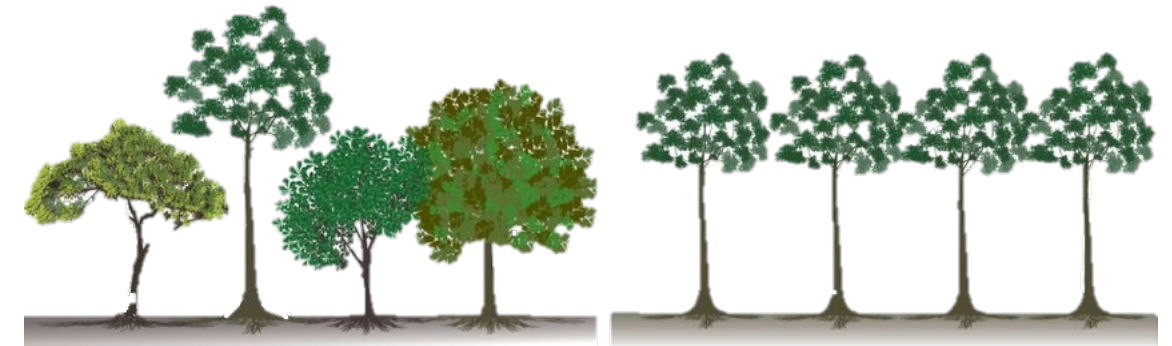
path dependencies, “points of no return”

- Traps
- **Tipping Points** triggers adverse **feedback loops**



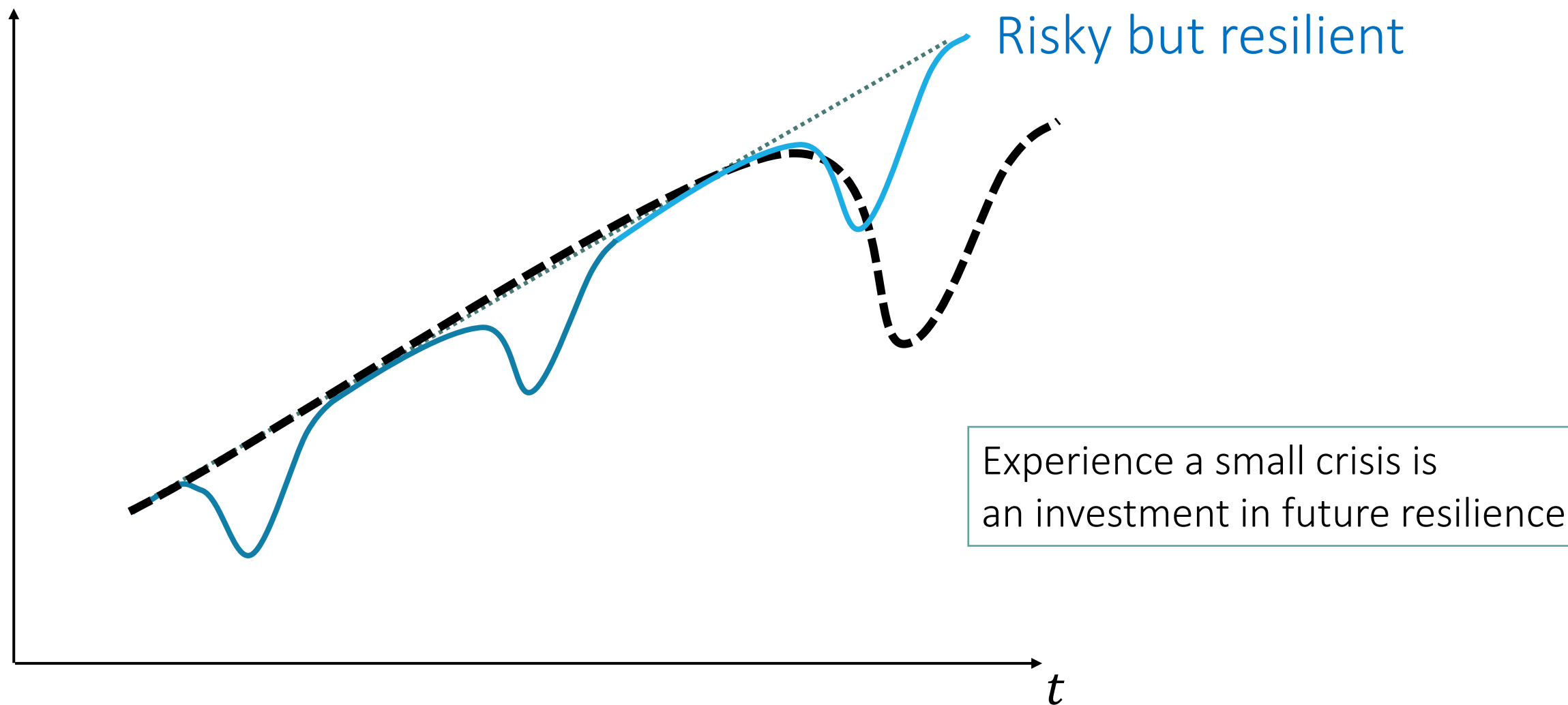
# Resilience Enhancers

- Positive Adaptability, Flexibility, and the Capacity to Change
  - Substitutability – low adjustment cost – Le Chatelier Prinzip
    - Rotation principle
    - Infrastructure, Digitalization, information flow and coordination
    - Standardization (generic chips)
- **De-complexivation**
- Diversity
  - Idiosyncratic vs. systematic shocks
- Open-mindedness – allow „Maverick thinking“
- Social cohesion
- Buffers and Redundancies (Inventories)
- Exposure to (smaller) Risks
  - teaches Resilience
  - Avoids build-up of Imbalances



# Resilience Enhances: Mastering smaller crises

1. Learning to be resilient via small risk exposure (human immune system)
2. Dynamic trade-off: when to use buffers (term structure of resilience)
3. Avoid build-up of imbalances (“push can down the road”)



# From Risk to Resilience Management

temporary

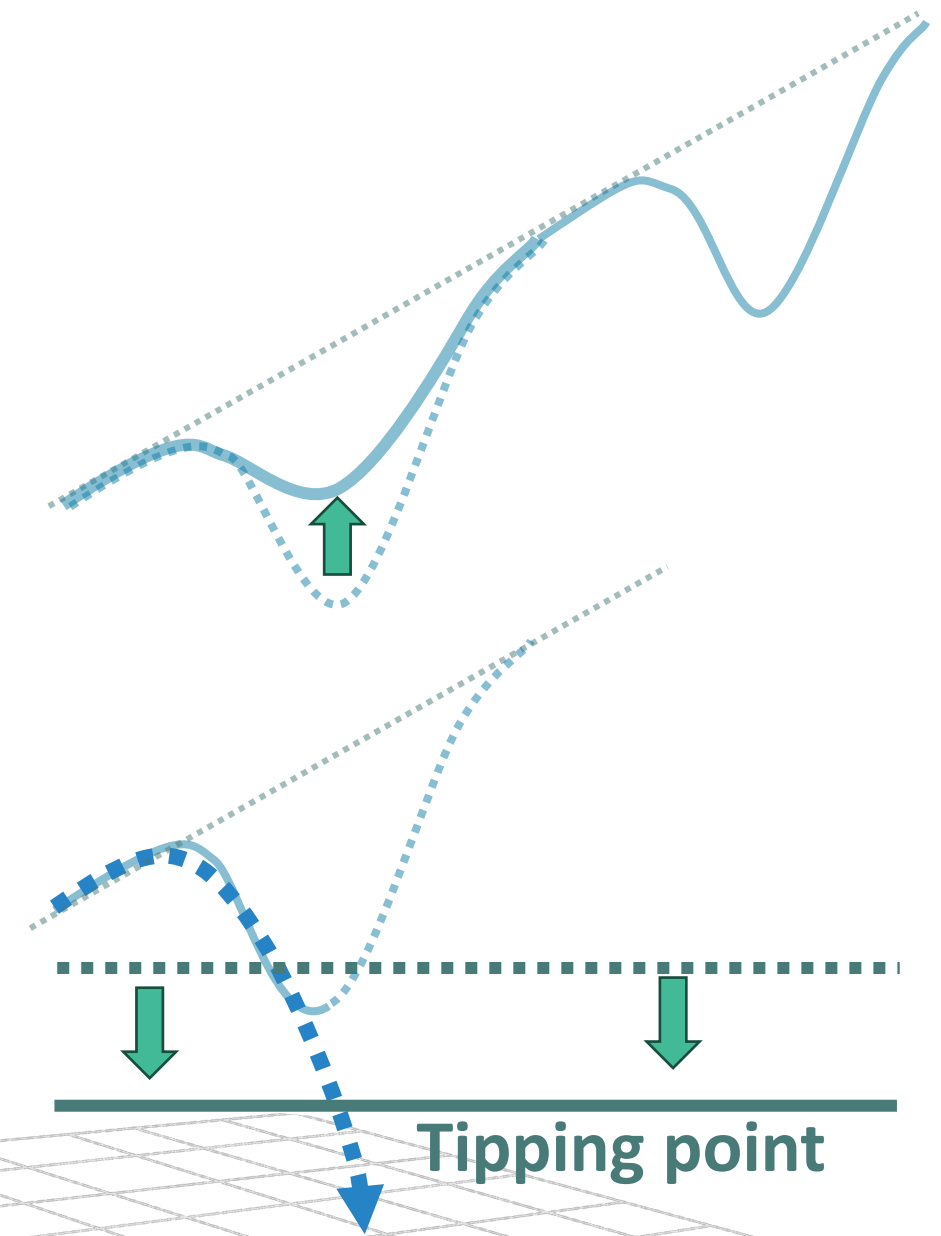
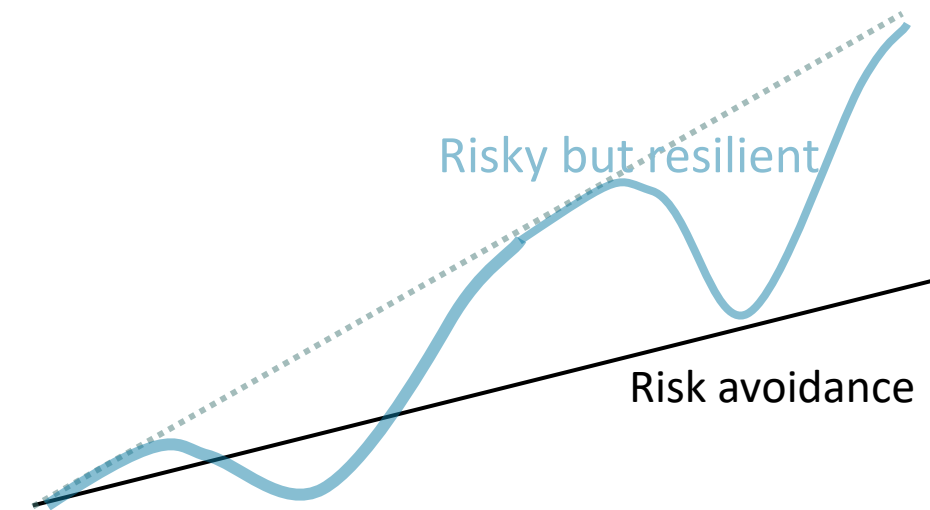
long-run

Shift in Mindset

## ■ Risk Management

- Avoid + diversify risk at  $t$ , given  $E_t[R_{t+1}]$   
(exposure to many shocks a bit rather highly to a particular one)
  - “don't put all eggs in one basket”

## ■ Resilience Management: Adapt after risk realization at $t + 1$



# From Risk to Resilience Management

temporary

long-run

Shift in Mindset

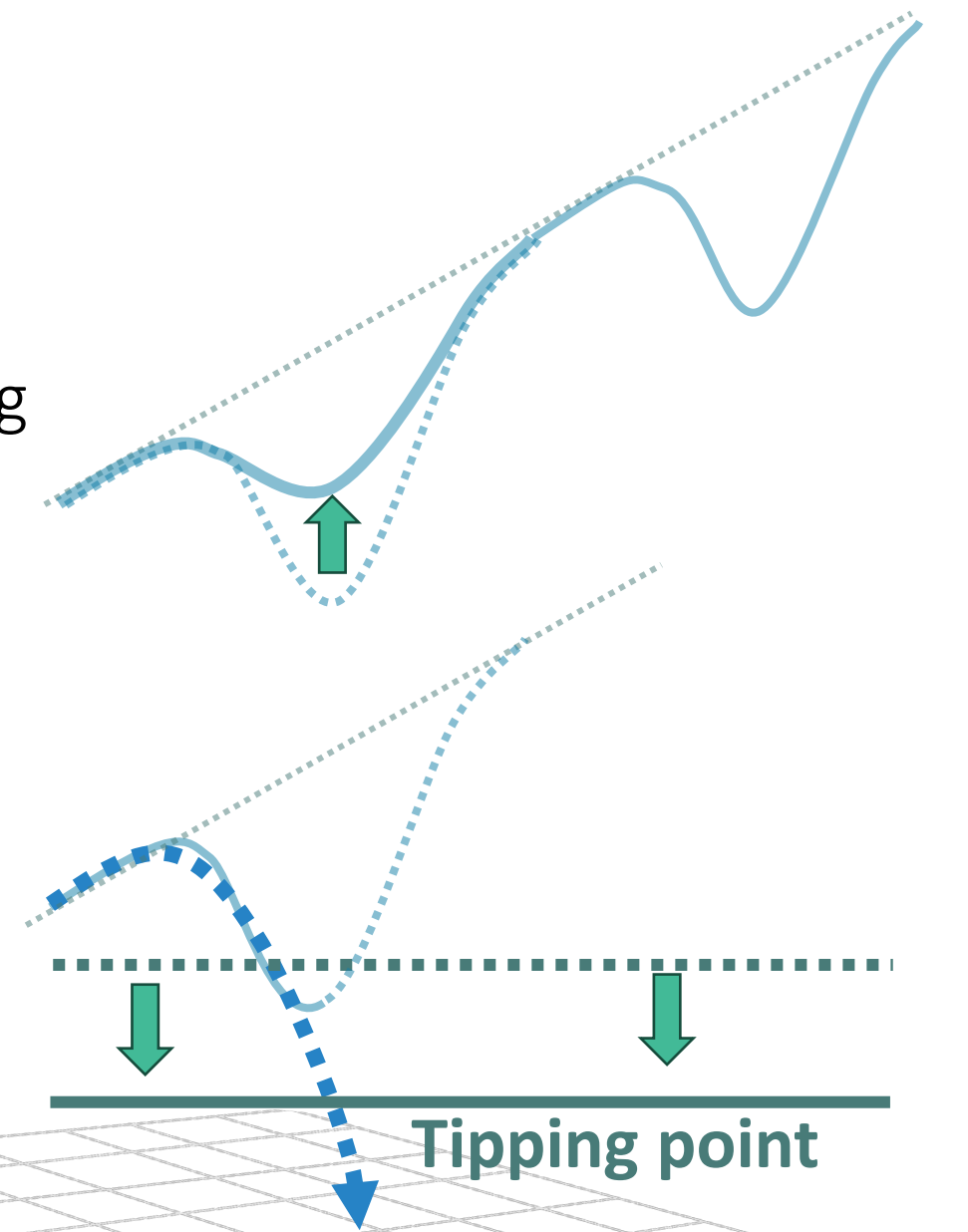
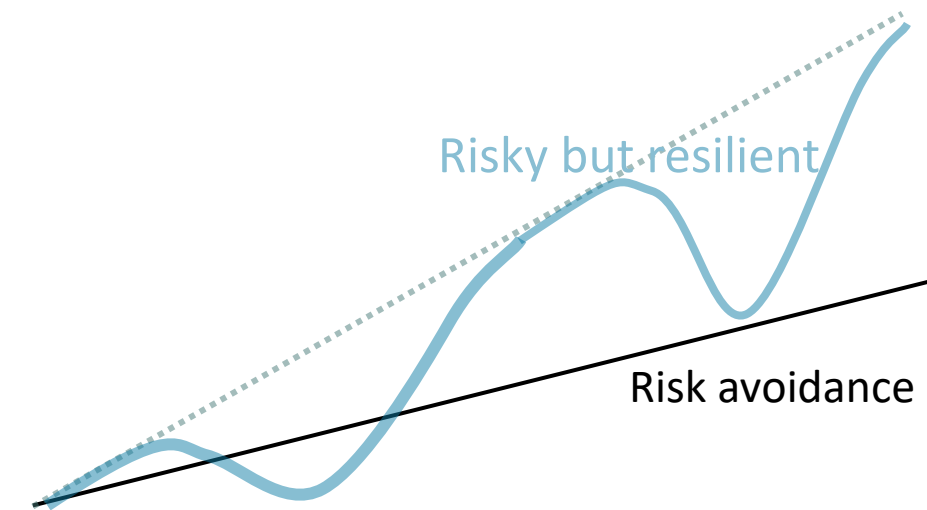
## ■ Risk Management

- **Avoid + diversify risk** at  $t$ , given  $E_t[R_{t+1}]$   
(exposure to many shocks a bit rather highly to a particular one)
  - *“don't put all eggs in one basket”*

## ■ Resilience Management: Adapt after risk realization at $t + 1$

- **Invest** at  $t$  in positive **adaptability/agility**
  - **Substitutability + scalability:**  
Liquidity, elasticity of substitution, low adjustment costs, multi-sourcing  
(gain expertise/trading desk for several asset classes)
  - *“open many doors, so that one can easily and swiftly react”*
- Push away adaptability inhibitors, **traps** and **tipping points**
  - **Buffers:** Equity capital, reserves, redundancies, **diversification**
  - *“build up a war chests/buffer”*

- Links: Hedging demand a la Merton,  
Long-run Risk can't be diversified, only adaptability





# Risk vs. Resilience Diversification

## ■ Risk diversification

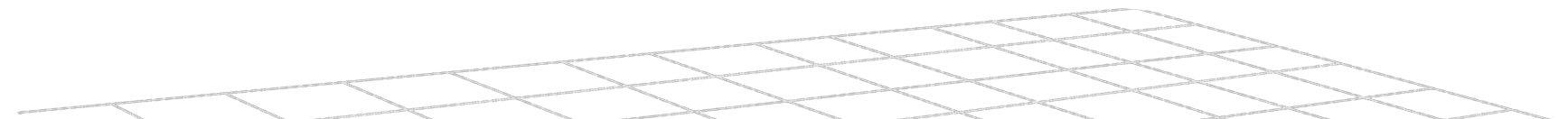
- Spread across many, each a bit
- “don’t put all eggs in one basket”
  - Example: Many MoPo instruments a bit, instead of one a lot

Correlation

## ■ Resilience diversification

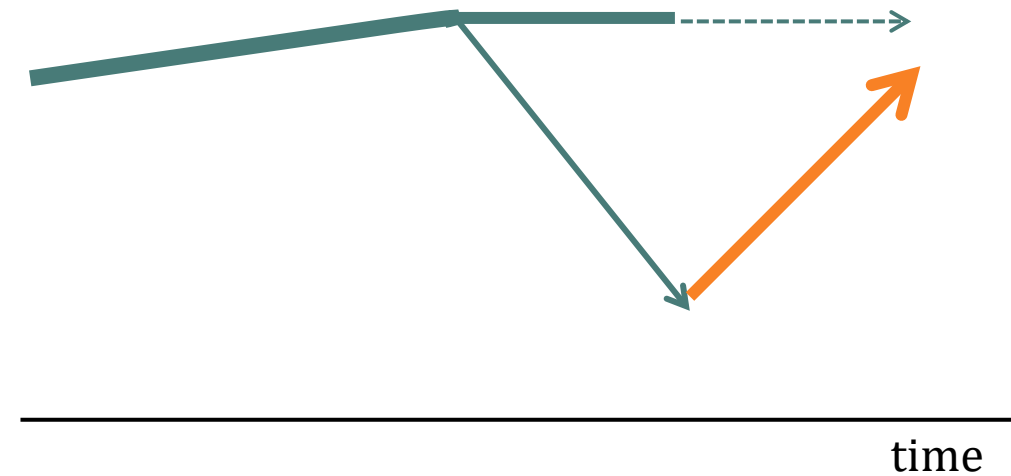
- Initiate many, **scale up** after realization
- “open many doors, so that one can easily and swiftly react”
- Increases agility, reaction speed

Adjustment cost



# Resilience after Shock vs. Shift

## ■ After Shock



## ■ After Shift/Transition

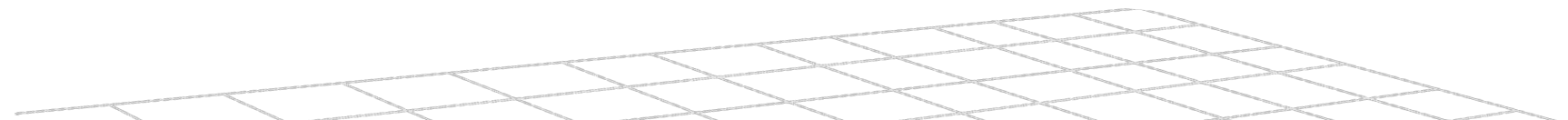
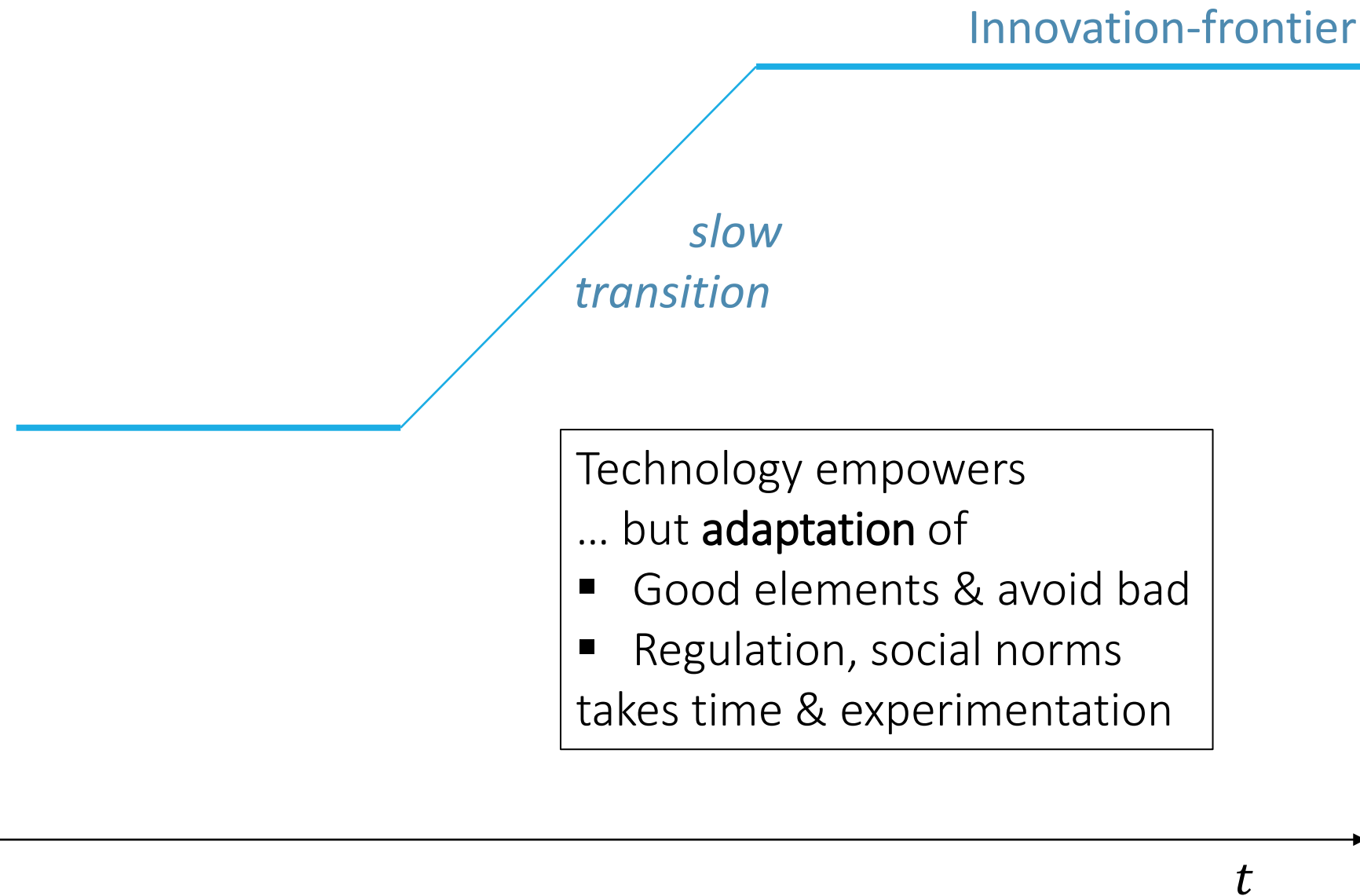
- Green transition
- AI Revolution
- Demographic change

two speed adaptation/adjustment leads to  
inequality/imbalance  
can derail system/economy/society



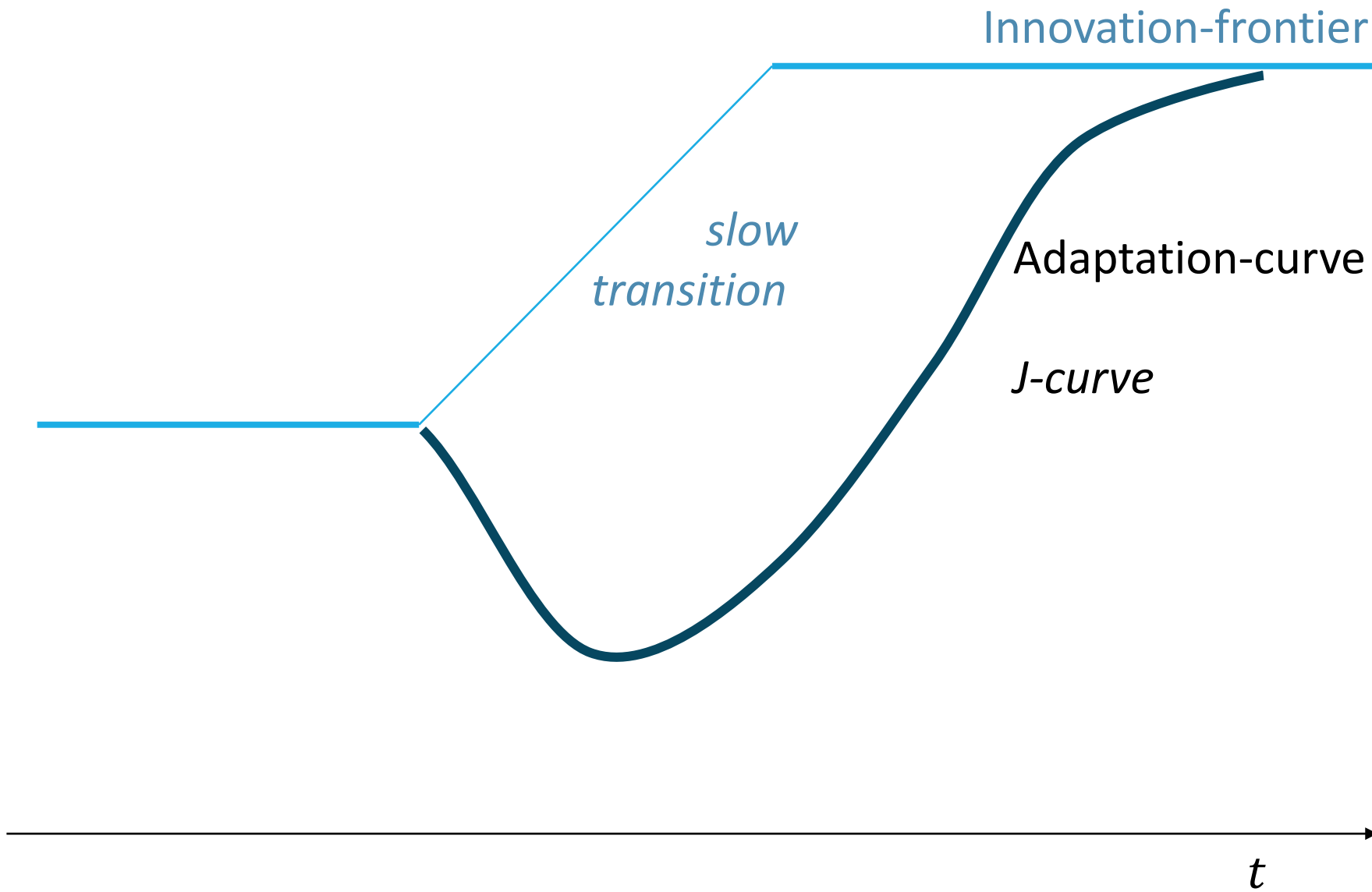
# Shifts, J-curve Effect, Resilience

with Daniel Chen



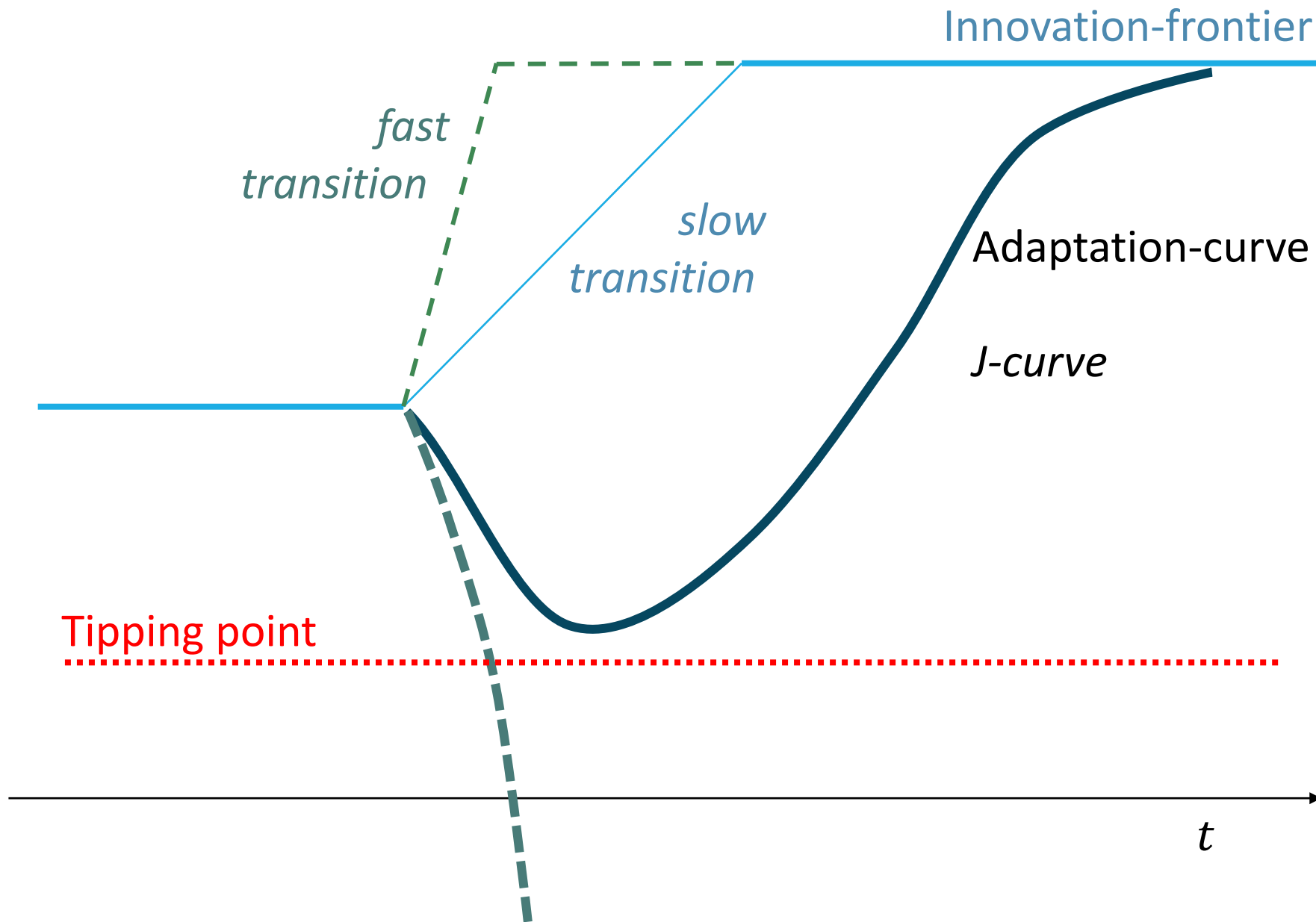
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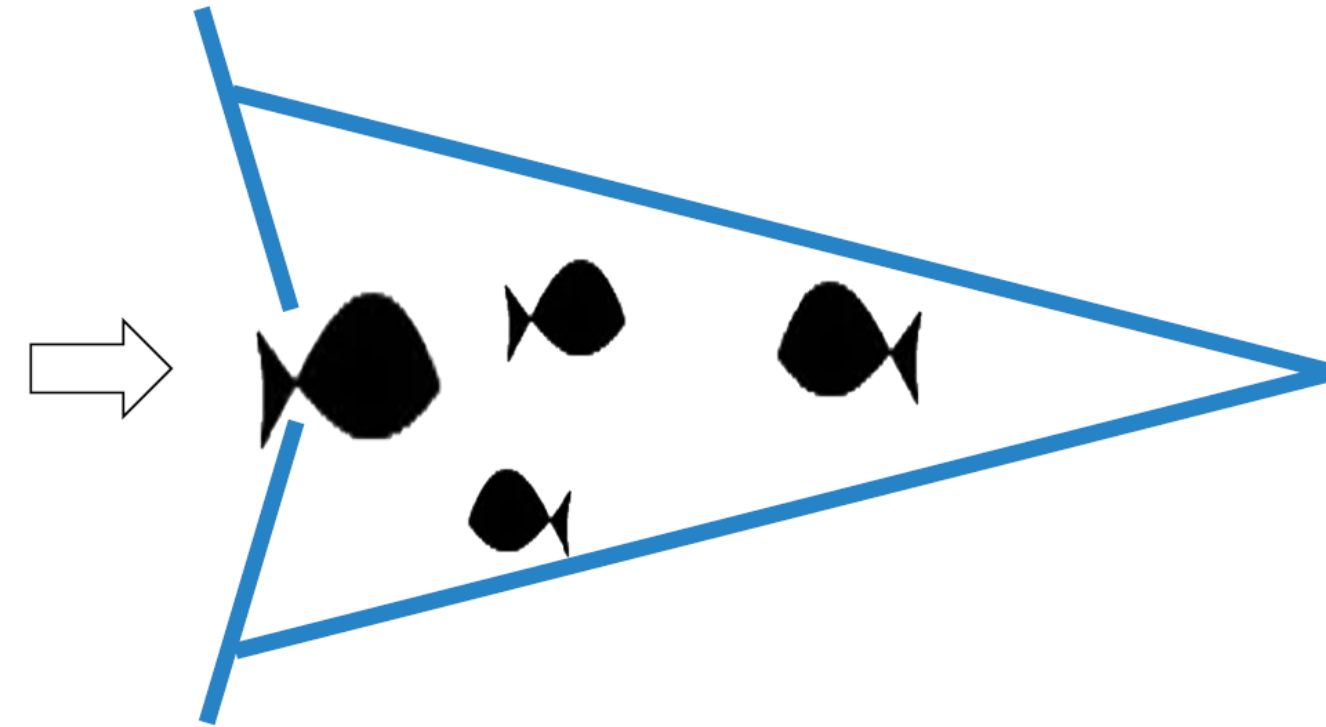
# Monetary & Fiscal Policy and Resilience

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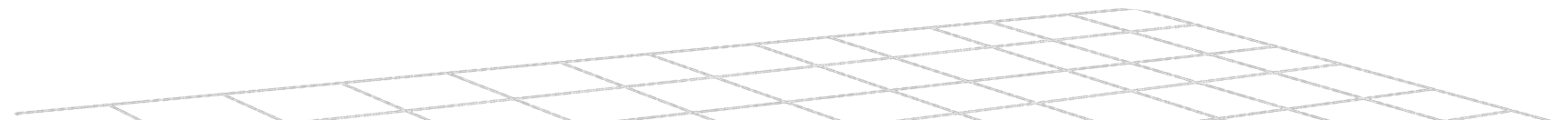
# Trap thinking

- Trap = “no bouncing back” = no resilience
- Avoiding traps requires ex-ante thinking
- Limit Odyssean forward guidance
- How to avoid “fiscal dominance trap”?
  - Central Bank Independence
  - Communication and backing by general public
    - Political pressure
- How to avoid “financial dominance trap”?
  - Macro-prudential regulation
    - Ensure that financial sector does not constrain monetary policy room



# (Hidden) Forward Guidance

- Explicit Odyssean Forward Guidance “traps” future MoPo
- Hidden Forward Guidance
  - “Data driven approach”
  - Sequencing
    - Only raise interest after QE is completed





# Monetary Policy-Resilience Dilemma

- No commitment
- No adaptability

MoPo has limited power (due to time-inconsistency)

MoPo can't react to orchestrate "bound back"

## ■ Commitment

- To fixed action
- To (state contingent) rule



- More impact (credibility)  
*in the present*

## No Adaptability/Discretion

- to possible contingencies (risk)
- to unforeseen contingencies (uncertainty)

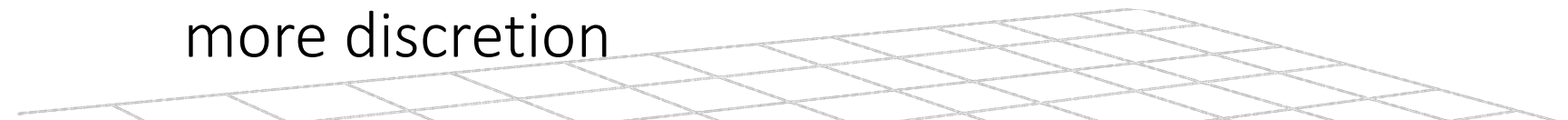


less flexibility  
*in the future*

- Interior optimum via (i) institutional design (ii) CB balance sheet

### ■ Comparative static:

- More severe time-inconstancy problem
  - Less predictability (risk)
  - Less foreseeability (uncertainty)
- sacrifice adaptability/resilience  
refined rules to adapt  
more discretion



# Resilience and Inflation Anchor

- With inflation anchor:
  - Central bank can let inflation temporarily rise (to accommodate shock/redistribute) without derailing long-run nominal interest rate
  - Monetary policy tool is more effective/powerful to orchestrate a “bounce back”
  - Can
- When inflation anchor breaks long-term nominal interest rate rises (potentially undoing an interest rate cut)
- De-anchoring = spiraling out of control (or simply limited amplification (price-wage spiral))
- Anchor: Higher order **beliefs coordination** (convention, common knowledge (David Lewis))
  - Expectations about other’s beliefs/reaction.
- How to strengthen an inflation anchor/focal point?



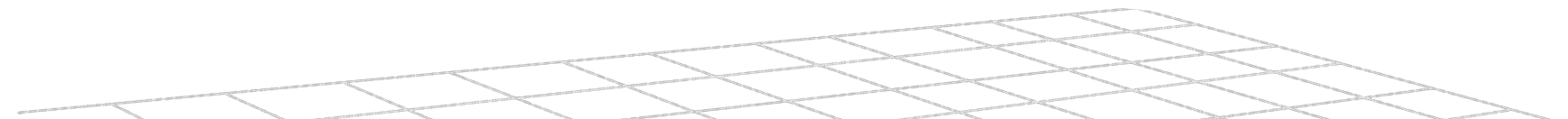
# Fiscal Dominance – Central Bank Independence

- Monetary tightening  $\Rightarrow$  large fiscal implications  
 $\Rightarrow$  Danger of “fiscal dominance”
- Monetary Dominance and **CB communication**
  - Narrative + blame game
- **Central bank independence** is key
  - **Well capitalized** CB balance sheet
    - Measured in terms of **risk** (rather than \$,€,¥,£)
    - Headline risk
      - Loss on long-dated assets due to QE
      - Delay QT to avoid realizing capital losses **Trap**
  - **Interest payments on reserves** to private banks
    - CB funding cost has doubled (BIS bulletin)

New Tool: Required vs. excess reserves

# Roadmap

- Risk, Robustness, Resilience Approach
- Monetary Policy-Resilience Dilemma
- Fiscal Dominance and Central Bank Independence
- Financial Dominance: Managing the Price-Finance Stability Tradeoff with QE/QT
- Resilience to Shifts (instead of Shocks)
- Resilience via Exchange Rate Movements



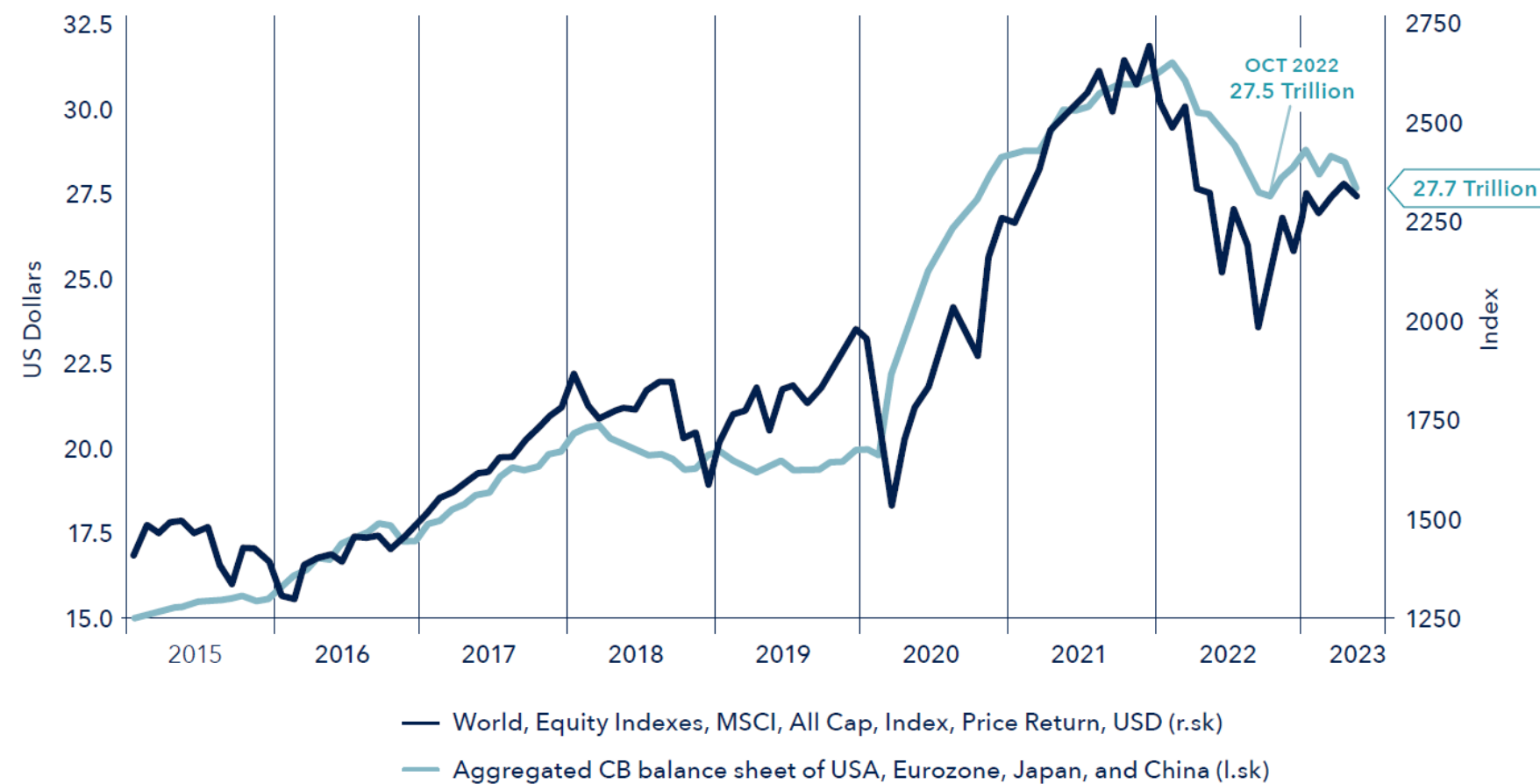
# Financial Dominance

## Price vs. financial stability



- pro-long intervention
  - CB distorted asset price signals,
  - financial markets become “addicted”

less resilient to shocks!

**FIGURE 1. Balance Sheet of Central Banks in the G4 Countries (in trillion USD)**



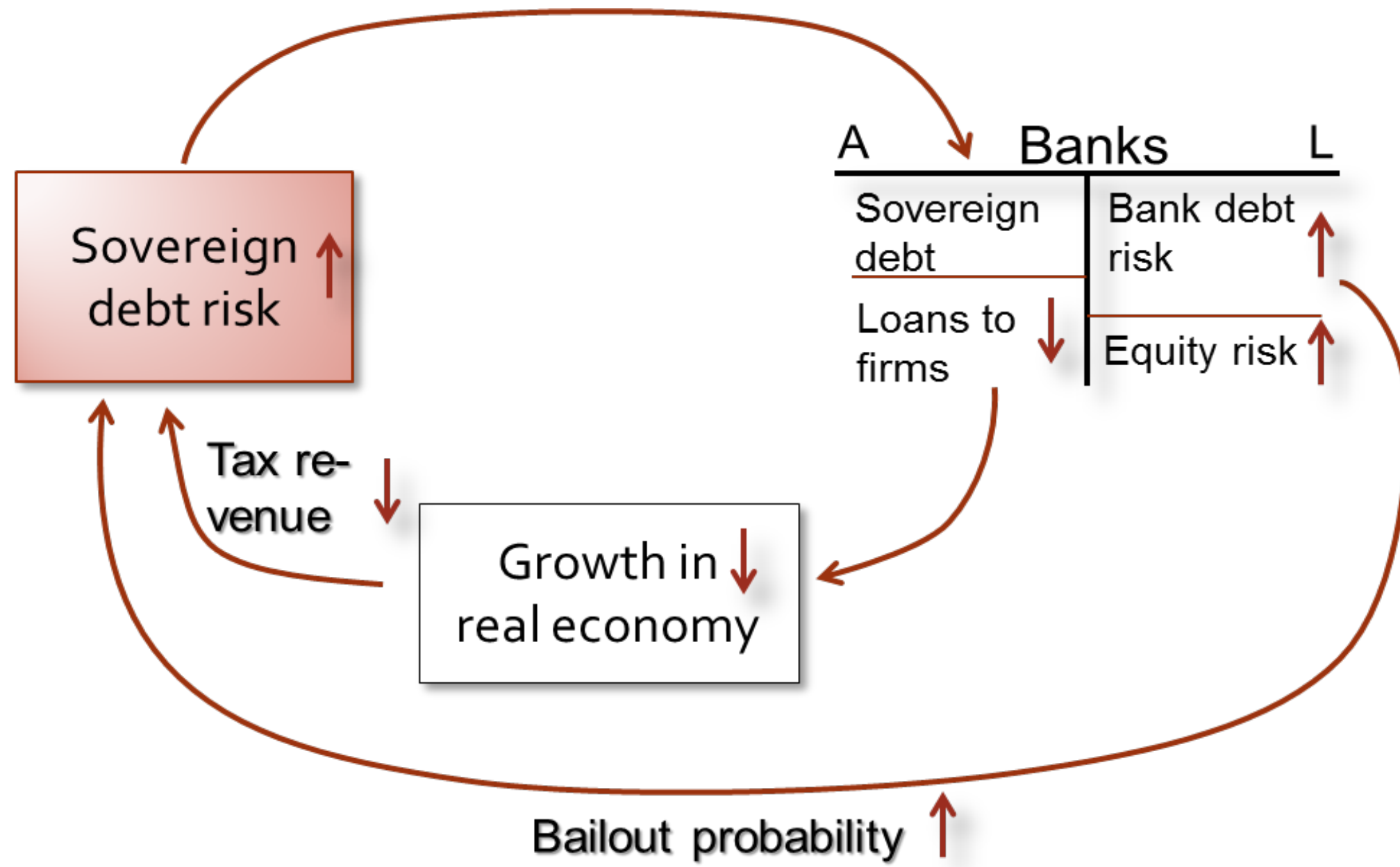
# Financial Dominance: Reduction via Preparatory QE/QT

- QE/QT-Unconventional Monetary Policy
  - Signal that exit will be costly – like a trap
  - Relax constraints of banks
- Here: **QE/QT as mediator** for interest rate policy Alexandrov-Brunnermeier (2024)
  - Interest rate policy has dual roles:  conflict reduces adaptation/resilience
    - Inflation/price stabilization (standard NK model)
    - Financial stabilization: Redistribution due to effects on long-term bonds
  - By adjusting the bond/reserve ratio in the economy, CB changes reduces subsequent conflict of interest rate policy  
btw. price and financial stability
  - QE is a tool to prepare for shocks, not a tool to respond to them
    - Too late once the shock has arrived.
  - Optimal policy: **preperatory QE** to reduce trade-off between price vs. financial stability  
better interest rate policy  improves resilience

# Financial Dominance and the Doom/Diabolic Loop

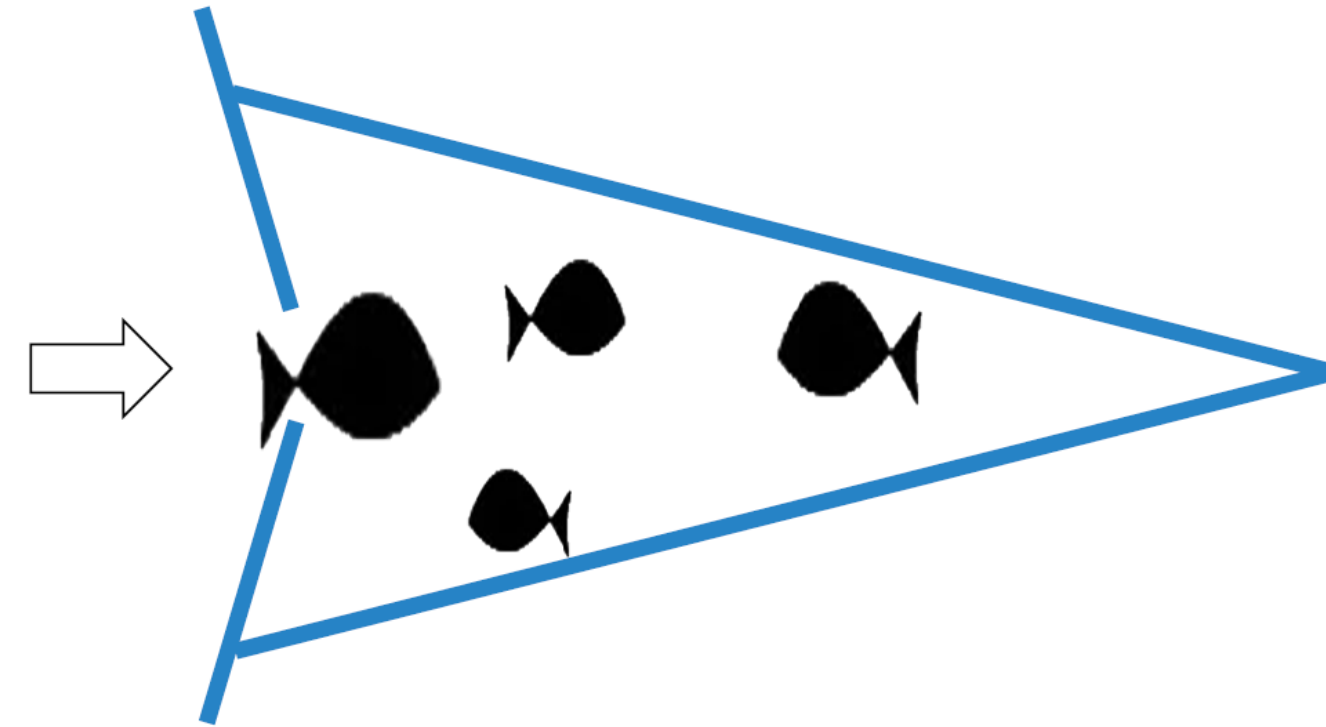
- Doom/Diabolic Loop

Risk-weights



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# Resilience via Flexible Exchange Rates vs. Buffers

## 1. Exchange Rate Devaluation

- Implicit “transfer” at the expense of other countries

### 1. **Global risk sharing arrangement** (ex-ante perspective)

- Temporary & mutual
- Helps to bounce back (Phoenix miracle)
  - If debt is denominated in domestic currency (no “original sin”)

### 2. **Beggar-Thy-Neighbor**

- Continuously

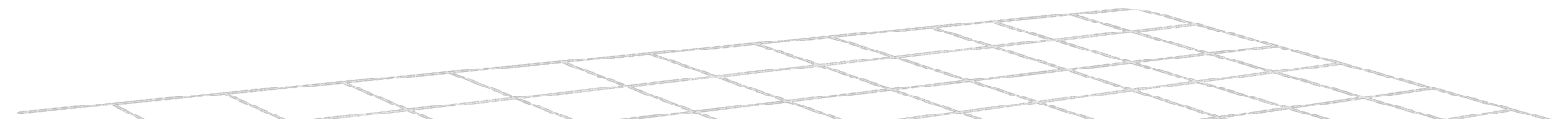
## 2. Fixed Exchange Rate & Buffers via Reserves

- Foreign reserves push resilience barrier further away
- ... but private sector issues more foreign denominated debt
- Push risk into the tails

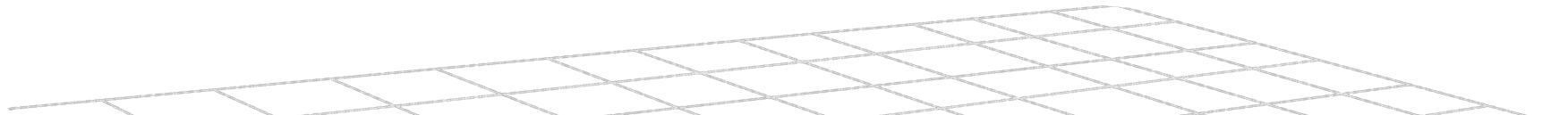


# Conclusion: Resilience and Monetary Policy

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**Thank You**



# What's a Safe Asset? What is its Service Flow?

- **Good friend analog:**

- Can sell at
  - (i) high price and
  - (ii) low-bid ask spread in crisis times (info insensitive)

1. In personal need: (idiosyncratic risk)

2. In crisis times: (systematic risk/hedge)

- Negative CAPM- $\beta$
- Precautionary savings
  - Low (cash flow) interest rate  $r < g$

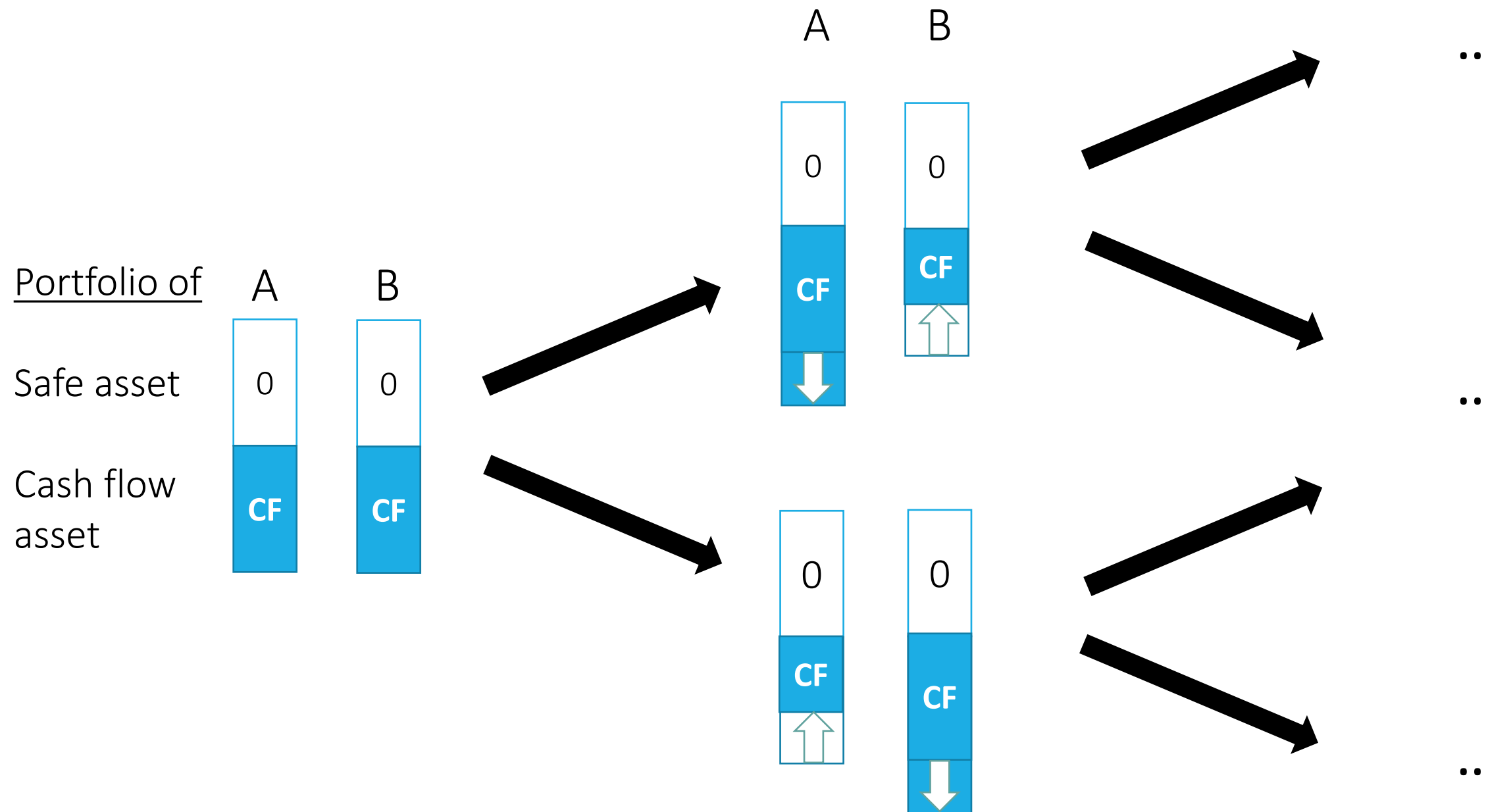
- **Safe asset tautology:** it is safe because it is perceived to be safe

$$P_t = E_t[PV_{r^{**}}(\text{cash flow})] + E_t[PV_{r^{**}}(\text{service flow})]$$

Example: interest = 0 from re-trading

# What's a Safe Asset? What is its Service Flow?

$$\frac{B_t}{\phi_t} = E_t [PV_{r^{**}}(\text{primary surpluses})] + E_t [PV_{r^{**}}(\text{service flow})]$$
 Example: = 0

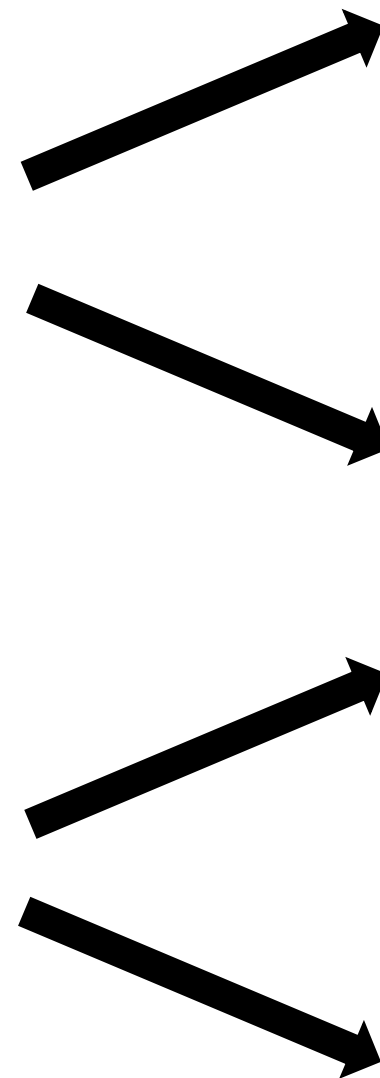
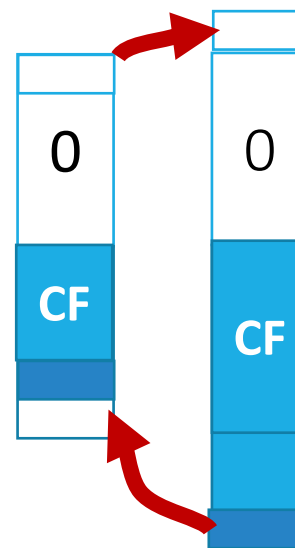
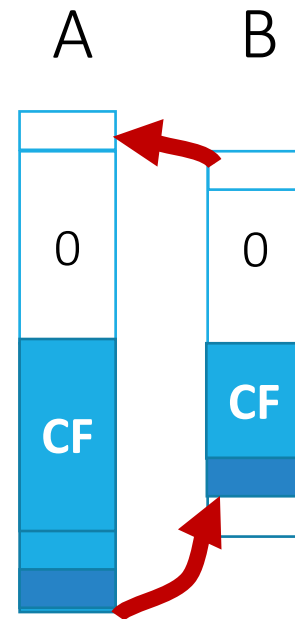
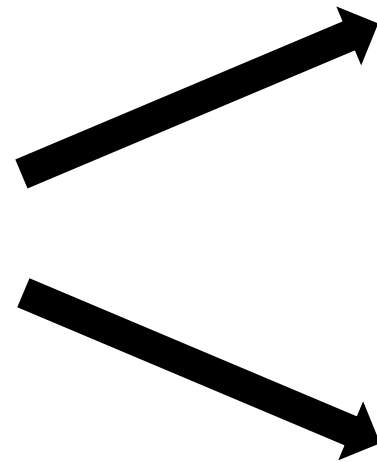
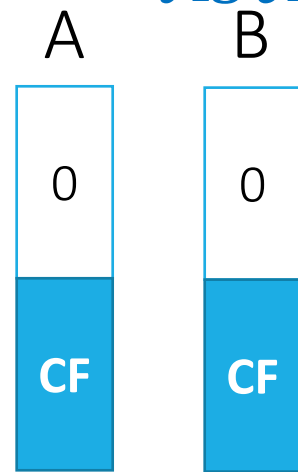


See Brunnermeier, Merkel, Sannikov (2024). "Safe Assets"

# What's a Safe Asset? What is its Service Flow?

- $$\frac{B_t}{\phi_t} = E_t [PV_{r^{**}}(\text{primary surpluses})] + E_t [PV_{r^{**}}(\text{service flow})]$$

- Value come from **re-trading**
- Insures by partially completing markets  
Reduces  $Var_t[\tilde{g}_c]$

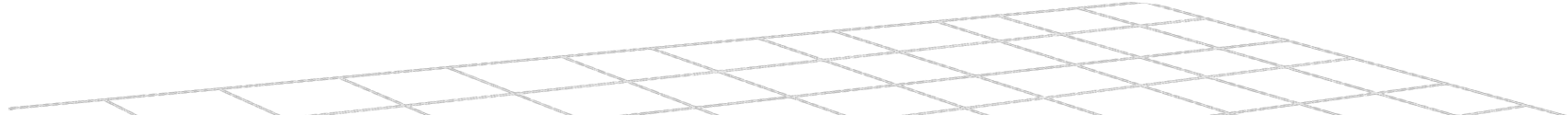


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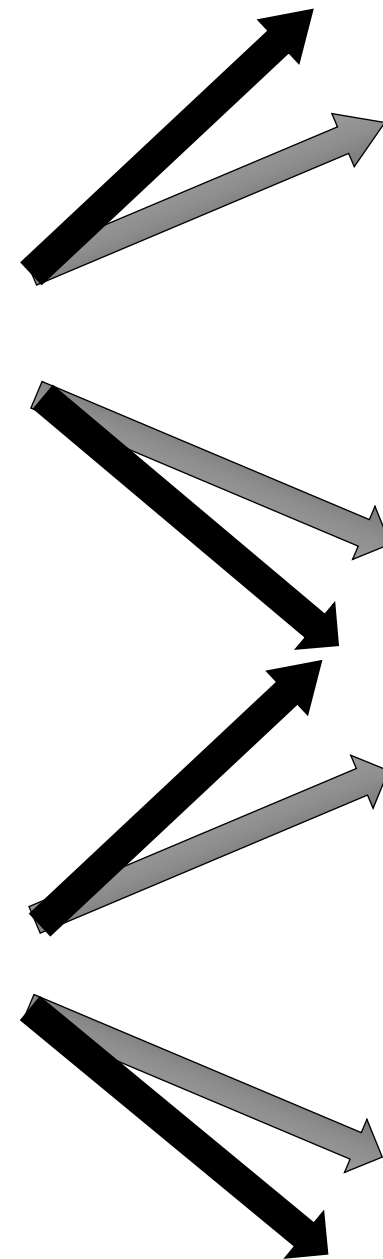
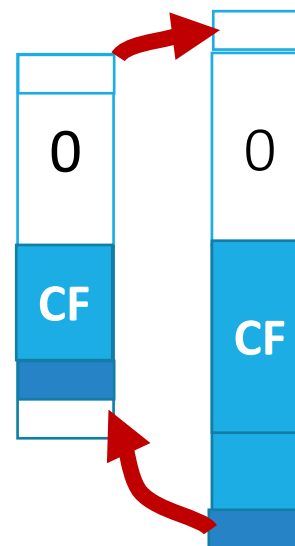
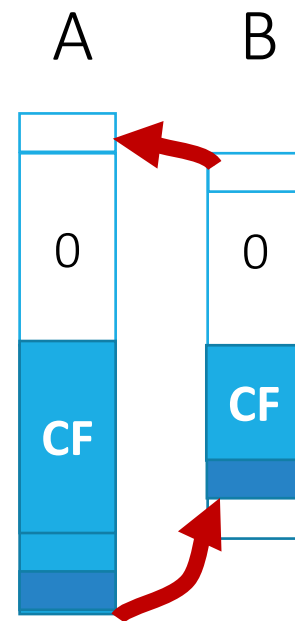
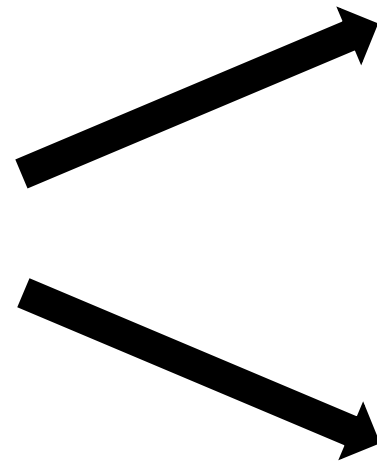
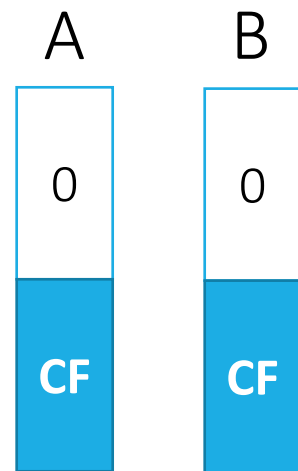
- Can be “bubbly” = fragile



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...

## In recessions:

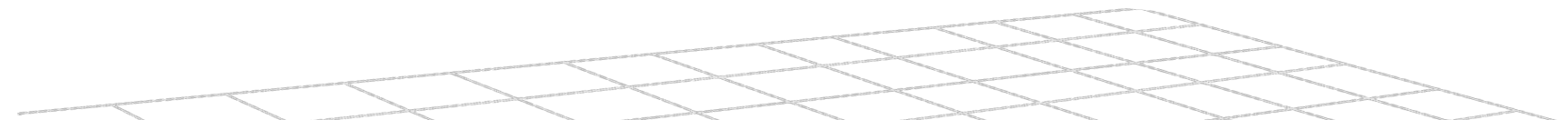
Risk is higher

- Service flow is more valuable
- Cash flows are lower  
(depends on fiscal policy)

...

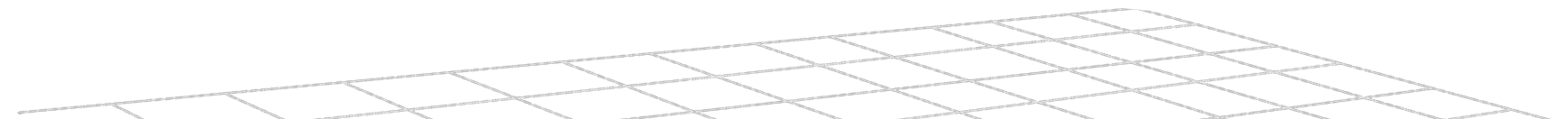
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# Risk-on, Risk-off – Resilience-on, Resilience off

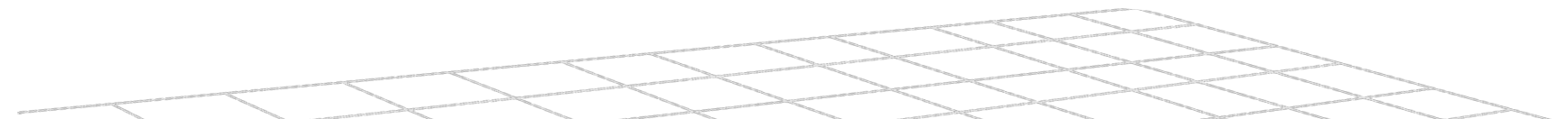
- Resilience on vs. off
  - Resilience on  $\Rightarrow$  temporary shock  $\Rightarrow$  arbitrage investors smooth out temporary shock  $\Rightarrow$  amplitude is smaller  $\Rightarrow$  more resilience
- 2 Forms of **Sudden stop**/capital flow reversal (multiple equilibria)
  - a. Default risk premium** higher  $r \Rightarrow$  higher default prob.  $\Rightarrow$  higher  $r$
  - b. Loss of (local EM) safe asset status**  
gov. debt bubble ( $r < g$ ) can't be supported anymore





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