Resilience and Monetary Policy
Monetary Policy: Risk and Resilience

- Deterministic thinking (outdated)

- **Risk** management approach
  - probability
  - + impact (disutility)
    - of contingency events

- **Resilience** management approach
  - Inflation bounced back (is “anchored”)
  - Avoid traps
Risk avoidance ≠ Resilience

- **Risk management**
  - *static*
  - Variance, Value-at-Risk, CoVaR
  - Uncertainty/ambiguity (robustness)

- **Resilience management**
  - *dynamic*
  - Mean-reversion, half-life
  - bounce “back” to new normal
Resilient Path

Risky but resilient to “new normal” (higher growth)

constant average inflation rate
Ability to Rebound Allows to Take Risk/Experiment $\Rightarrow$ **Growth**

- Resilient path vs. risk avoidance path

- Risky but resilient to "new normal" (higher growth)

- Riskless
  - No trial and error process
Robustness ≠ Resilience

- **Robustness**
  - withstand, fault tolerant
    - block most (also unknown) shocks
  - Robustness barrier
    - Tipping point

- **Resilience**
  - Impact, but bounce back “to new normal”
  - React to shocks

Robustness vs. Resilience

- **The oak**
  - "I bend, I bow, but I do not break"
  - La Fontaine

- **The reed**

**Volatility Paradox**
- Learning to be resilient via small risk exposure (human immune system)

**Redundancies:**
- many
  - fewer, but
  - adaptive capacity (re-deployable)
Risk Resilience management

- **Risk** management - *static*
  - Variance, Value-at-Risk, CoVaR

- **Resilience** management – *dynamic*
  - Mean-reversion half-life
    - Diversification
    - over random “bounce back dynamics”
    - Easier to adjust if groundwork is set over many alternatives

- **Resilience enhancers** adopt and strengthen

- **Resilience destroyers** avoid and weaken

- **Uber-Resilience**
Resilience Enhancers

- **Redundancies/buffers**
  - Inventories

- **Flexibility/liquidity/adaptability** via
  - Substitutability = reduce switching costs over time: Le Chatelier Principle
    - Instead of specialized chip use generic chip (lego principle)
    - Infrastructure, digitalization
    - Standardization

- **Diversity**
  - Idiosyncratic vs. systematic shocks
    - Diversification over random “bound back” + readjust more easily if starting point

- **Maverick thinking**
- **Social cohesion**
- **Learning from smaller previous crises**
Resilience Enhances: Mastering smaller crises

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

path dependencies, “points of no return”

- Traps
- Feedbacks
- Tipping Points

Diagram:
- Risky but resilient
- Riskless
- Trap
Resilience Destroyers

- Traps
- Feedbacks
- Tipping Points

path dependencies, “points of no return”
Resilience Destroyers

- Traps
- Feedbacks
- Tipping Points

Path dependencies, “points of no return”

Climate change: Turning off the Gulf stream
Escaping **Tipping Points** with Resilient Growth Path

- Seemingly riskless part with adverse trend subject to catastrophe risk
  - Resilience path is only hope
Resilience Destroyer: Financial Crises after Bubbles

- Japanese GDP
  - Lack of resilience after financial crisis, resilience after Fukushima
Resilience: Individual, System, Society
Resilience: Individual, System, Society

- **Individual**: Personal wellbeing, mental health
- **System**: Networks: electric grid, interbank market, GVC
  Systemic risk due to spillover, domino effects
  - **Feedbacks**: Externalities and endogenous responses
  - "Feedback Externalities"

"we have met the enemy and he is us"

General Equilibrium Perspective
Resilience: Individual, System, Society

- **Individual**: Personal wellbeing, mental health
- **System**: Networks: electric grid, interbank market, GVC
  Systemic risk due to spillover, domino effects
  subsystems do not need to be resilient if replaced
  (relative prices can change forever)
Resilience: Individual, System, Society

- **Individual:** Personal wellbeing, mental health
- **System:** Networks: electric grid, interbank market, GVC
  Systemic risk due to spillover, domino effects (CoVaR)
- **Society:** Interaction among humans
  - Selection is problematic: *inclusions vs. replacing*
  - Human actions are driven by expectations
Resilience and Speed of Change

- Transition phases

- Speed of shocks
  - "Slow" shock - sequence of small shocks
  - Rapid Shock/Jump
    - Reaction time is too slow

- Reaction time
  - Reaction is leaning against shock  \( \Rightarrow \) shorter is better
  - Reaction is amplifying (feedback loops)  \( \Rightarrow \) longer is better
Inflation and Resilience

Chapter 9
1. Power of Monetary Policy Resilience

- Bounce back after a shock via monetary stimulus

- Depends on strength of inflation anchor
  - Credibility
  - Resilience barrier: rubber bank breaks/snaps

- Higher order beliefs coordination (convention, common knowledge (David Lewis))
  - Uncertainty what others’ belief (about others’ beliefs ...)
  - Disagreement
  - Opaqueness whether wage increase is compensation for
    - past price increase
    - expected future price increase

- Strengthening the inflation anchor:
  - Focal point on anchor
  - *+ no other focal point*: creates confusion/uncertainty about alternative beliefs

- Re-anchoring at 3%
  - How to create common knowledge at different level?
Monetary policy acts with lags
  - Less pronounced than earlier
Reveals central bank’s “true type” (of anti-inflation commitment)
De-anchoring of expectations – loss of focal point (resilience barrier)
  - Costs depend on expectations formation
    - Adaptive
    - Extrapolative
    - Rational
  - Expectations confusion/disagreement
  - Uncertainty/risk creation

Policy Lesson: Narrative is key
  - Narrative not only for failure – danger of a blame game
  - “Clear Guidance Narrative” – going forward
Anchor, Inflation Expectations, CB Credibility/Reputation

- Inflation **predictability** ↓ but MoPo lag ⇒ “behind the curve”
- Mean reversion/inflation anchor implicitly assumed (VAR, stationary DSGE)
  - ⇒ transitory bias

Lesson: More responsiveness to data (higher Taylor coefficient) preserve inflation anchor

- “Data-driven MoPo” is forward guidance in disguise
2. Trap thinking

- Trap = “no bouncing back” = no resilience

- Avoiding traps requires ex-ante thinking

- How to avoid “financial dominance trap”?
  - Macro-prudential regulation
    - Ensure that financial sector does not constrain monetary policy room

- How to avoid “fiscal dominance trap”?
  - Central Bank Independence
  - Communication and backing by general public
    - Political pressure
2a. Monetary vs. Financial Dominance

- **Low inflation environment:** *concurrence* btw price and financial stability
  - Monetary loosening boosts demand and financial stability
  - “Whatever it takes” approach is feasible

- **High inflation environment:** *trade-off*
  - Price vs. financial stability
  - Expect less intervention
    ⇒ higher inflation expectations

- CB distorted asset price signals
  - Short vs. pro-longed intervention
2a. Monetary vs. Financial Dominance

- Doom/Diabolic Loop

Risk-weights

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<thead>
<tr>
<th>A</th>
<th>Banks</th>
<th>L</th>
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<tbody>
<tr>
<td>Sovereign debt</td>
<td>Bank debt risk</td>
<td></td>
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<tr>
<td>Loans to firms</td>
<td>Equity risk</td>
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Sovereign debt risk

Growth in real economy

Tax revenue

Bailout probability
2b. Monetary-Fiscal Interaction

- Fiscal policy impacts on inflation (demand/FTPL)
- Monetary tightening has much large fiscal implications
  - Due to high debt level

Central Bank-Government tensions/political pressure
2b. Monetary vs. Fiscal Dominance – “Game of Chicken”

- Central Bank Independence
  - Legal, international treaty
  - Capitalization of CB’s balance sheet
    - Interest rate payments on reserves to private banks
      - Loss on long-dated assets due to QE
      - CB funding cost has doubled (BIS bulletin)
    - Headline risk
  - Lessons

- Monetary Dominance & Sovereign debt restructuring costs
  - Ultimate subgame as shifter of bargaining power in game of chicken

- Monetary Dominance and CB communication
  - Narrative + blame game

Fiscal Implications
2b. Fiscal Inflation Link
Policies in a High Stag-inflationary Environment

- **Supply** chain disruptions
  - Energy – elasticities of substitutions (micro vs. macro, ST vs. LT)
  - Food shortages (starvation)
  - Cyber attacks
  - Covid outbreak in China (vaccine)

- **Demand/investment boost**
  - Rearmament
  - Green transition

- **Redistribution**: oil importers to oil exporters (windfall gains)

<table>
<thead>
<tr>
<th>Expand supply</th>
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<tbody>
<tr>
<td>- Energy transition</td>
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<tr>
<td>- EU agricultural policy</td>
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<td>- Share mRNA vaccines</td>
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<tr>
<th>Estimate increase in $r^*$</th>
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<tr>
<td>⇒ instability</td>
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Precautionary savings

Petro dollar recycling
(analog of 1970s Kissinger idea to create a “buy-in”)
Changes and Challenges

- **What’s new?**

  1. High **gov. debt level**, Fiscal policy impacts inflation

  2. High **private debt level + inflation**
     High asset prices, depressed risk premia

  3. Limited inflation **predictability**

  4. **Polycrisis**
     - Supply/ demand, idio/systematic risk, temporary ...

  5. **Transition phase** due to Structural Changes
     - Green transition, WfH, De-globalization, Demographics
     - Digital Money/ CBDC etc.

**Implications for Central Banks**

- **Monetary-Fiscal Interaction**
  - from coexistence to rivalry/blame game
  - Central Bank independence

- **Monetary-Financial Stability Interaction**
  - from congruence to trade-off
    - Demand management vs. Fin stability

- **MoPo lags and behind the curve**

- **Humbleness of Central Banks**
  - Fallacy to “look-through” supply shocks

\( r^* \) and risk premium transition
Structural Changes and their Transitions

- MoPo is not designed for structural changes, but can accommodate transition
- Impacts $r^*$ and risk premia

1. **Green transition**
   - Reduced investment in dirty technology
   - Destruction of dirty and increase in green technology
   - $r^*$ increases

2. **Work from home**
   - More leisure, lower labor income
   - Productive loss/gain?

3. **Demographic change**
   - More saving followed by more dissaving

4. **De-globalization**
   - Efficiency loss (via trade barriers)
   - For export nations also negative demand

5. **Digital Money**
Conclusion: Resilience and Monetary Policy

- **Risk** management approach
  - probability
  - + impact (disutility) of contingency events

- **Resilience** management approach
  - Inflation bounced back
    - Temporary adjustment helps to manage shocks/transition phases
    - Maintaining “inflation anchor” is key (Common knowledge)
  - Avoid traps
    - Financial dominance
    - Fiscal dominance
Resilience and Global Order

Chapter 9
Resilience and Global Order

- Geopolitics
  - Geography
  - Zero-sum game

- Global Common and Public Goods

- Global Trade

- Global Finance

- Emerging and Developing countries
Global Resilience Paradox

- “Global resilience is undermined by local resilience”

- Global resilience as global common good
  - Underinvestment in buffers, substitutability, infrastructure

- Local resilience (self-sufficiency)
  - Investment in local resilience lowers investment in global resilience
    - Lower mutual interdependence

- ... even though global resilience is much more cost-efficient
Competition of Systems - Fragmentation

- Cold War
  - Capitalism (Neoliberalism) vs. Communism (autocratic)

- Now
  - “The West” “autocratic system” (Neodirigrism)
    - Focus on individuals
      (human rights, ...)
    - Not geographic
      (Japan, Korea, but not Russia)
A Personal Conjecture

- In an increasingly complex society

- **Autocratic societies**
  - Seek **robustness** – attractive feature after crises
  - Suppression, minimize movements/disruptions
  - Surveillance
  - Tighten with each crisis ... no rebound

- **Open/democratic society**
  - More **resilient**
  - May appear wobbly when shock hits but internal mechanism allow for rebound
  - Open to mavericks
  - Transparency and more information flow/aggregation

  *Good in*
  - **Enforcing rules**
  - **Invented universally accepted vaccines**
Global Trade and Geopolitics

- **Pre:** Mutual interdependencies ⇒ to ensure peace/international stability
  - “Just-in-time”, Global Value Chains
    Wandel durch Handel
  - ... but slowabilization (in goods only)
Global Trade and Geopolitics

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- **Post:** country **Resilience** $\Rightarrow$ less global stability
  - “Just-in-case”, autarky, self-reliance
    - $\Rightarrow$ higher inflation, real interest

  Stress tests for global value chains

- “Fork in the road”: Fragmentation?
  1. Reshoring,
  2. Friend-shoring or
  3. Multi-sourcing
Global Finance

- Resilience via **flexible exchange rates**
  - Shock: Devalue currency ⇒ export boom, import shrinks
  - **Mutual resilience insurance** across countries: common good
    ... but
- 1930: Beggar-Thy-Neighbor – exploit with intent
- 1944: Bretton-Woods-System
  - Fixed exchange rates  US$ in the center (US$ linked to gold)
- 1971: Nixon Shock
  - **Flexible exchange rates**  ERM “snake” for Europe
  - Open current accounts
  - US$ became more dominant due to eurodollar market
  - Fed Swaplines
- 1998: South-East Asia crisis ⇒ EME reserves accumulation
Global Financial Architecture

- **Flight-to-safe asset**
  - Tightening of US Monetary Policy
  - Risk-on, Risk-off
International: Flight to Safety

- **Risk-on, Risk-off** Flight-to-safe asset

- **Problem**: Safe asset is \textit{asymmetrically supplied} by AE

  Flight-to-safety \quad \rightarrow \quad \textit{cross-border} capital flows

- **Debt issues at times of global crisis**
  - For AE at inflated prices eases conditions
  - For EME at depressed prices worsens conditions

**Paradox**: “Poor insure rich Paradox”
Two Approaches

- **Approach 1: “Buffer Approach” (traditional)**
  - Lean against sudden stop (flight-to-safety) capital outflows
  - Precautionary Reserves
  - IMF liquidity lines
  - Central Banks Swap line arrangements

- **Approach 2: “Rechanneling Approach” (new proposal)**
  - “Global Safe Asset from & for Emerging Economies”
A Safe Asset for Emerging Economies: Rechanneling Approach

- Address root cause: Safe asset is supplied asymmetrically

- Create globally supplied safe asset for EME via pooling & tranching

- Expand ESBies idea for euro area to EME:
  “SBBS (Sovereign-Bond Backed Securities) for the world”
  Euro-nomics group 2011, 2016, 2017
International: Flight to Safety

- Risk-on, Risk-off → Flight to **safe asset**

- Channels back some of flight-to-safety capital flows
  fewer **cross-border** capital flows
“Digital Currency Areas” - Global Fragmentation

**US:** Stablecoins in US $
- programmable tokens of social networks/industry 4.0
- Challenge: regulating stablecoins, platform interoperability

**Europe:** Digital Euro (CBDC)
- Consumer (not industry 4.0 focused)
- Challenges:
  - Programmable/Smart contract integration is limited
  - CBDC as legal tender undermines smart contracts further

**China:** AliPay and WechatPay + Digital Yuan
- Consumer (convenience) + medium of exchange focused

**EMDE:** Domestic CBDCs to fend off digital dollarization
- Challenges: loss of monetary sovereignty and cheap funding

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Positive (not normative)

“Digital Currency Areas” - Global Fragmentation

Shaped by privacy regulation

Rent seeking by Stablecoin companies

offensive

defensive
Climate Change Challenge

- Global Public Good with
  - Double-externality: R&D and pollution
  - + network externalities: Chicken-Egg problem (QWERTY)
  - “Climate Clubs”

- De-growth strategy vs. innovation
  - Covid CO2 emission reduction was minimal

- Three-prong strategy
  - Mitigation - electric vehicles
  - Adaptation – high-tech dikes
  - Amelioration – geoengineering

- 2 Reaction to Ukraine war: speed up vs. turn around?
Inequality: Resilience with Inclusion

- Income inequality static measure

- Wealth inequality
  - Discount rate effects

- Social mobility dynamic measure
  - How many generation does it take to move to the top?
  - Stylized Example: 2 groups switching rank repeatedly
  - Elephant curve – The Great Gatsby Curve

- Resilience inequality (new concept)
  - Some people bounce back more easily than others
    ... and hence can take more risk (earn higher risk premia)

- Insecurity
  - Moving comparative advantage
Resilience and Policy Implications

- **International Trade: Global value chains**
  - From “just in time” to “just in case” — stress tests for GVC (resilience lessons from GFC)

- **International Macro-Finance**
  - Flexible exchange rate — Foreign exchange reserves (buffers) + MacroPru (limited $-debt)
  - Poor insuring the rich: “GloSBies” and Global Role of the US dollar as safe asset

- **Global geopolitics — cyber warfare**

- **Emerging Economies — poverty and middle-income traps**

- **Climate change — Sustainability = resilience + no adverse trend**

- **Macro**
  - Low interest rate ⇒ more fiscal, less monetary resilience

- **Finance**
  - Equity
  - Debt
  - Cash flow
  - “Robustness barrier”

- **Health**
  - Vaccines to return to “new normal” (Uber-Resilience) vs. China’s zero-Covid

Resilience and Policy Implications
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  - Distributed Ledger Technology (DLT)

- **Resilience Inequality ⇒ income and wealth inequality**

- **Health:** Vaccines to return to “new normal” (Uber-Resilience) vs. China’s zero-Covid

- **Education:** Foster taking initiatives, general and life-long education, no comparisons to others
Thank You
Resilience and the Slope of the Yield Curve

- Resilient path

Resilience and the slope of the yield curve
- Increasing $\Rightarrow$ resilience (V recessions)
- Flat $\Rightarrow$ random walk (permanent)
Resilience: Debt vs. Equity

“robust”/resistant until it breaks through “Robustness barrier”

Equity

Debt

Tax revenue

Runs
Resilience enhancer: Bankruptcy Protection

- Bankruptcy in US:
  - Bankruptcy
    - Chapter 11: 15.6%
    - Reorganization & Continuation: 10.2%
  - Out of Court
    - Chapter 7: 84.4%
    - Liquidation: 5.4%
    - Stop operating without bankruptcy: 8.3%
    - Renegotiation & Continuation: 91.7%

Source: Greenwood, Iverson, Thesmar 2020
Stock Market Resilience - Cross-section

- Resilience = price reversals
  - Long-run Price Reversal: 4 years
    DeBondt and Thaler (1985)
  - Medium-run Momentum: 6 months
  - Very short-run Reversal: daily

- ... more after downside-shocks?
  - Negative skewness (asymmetric distribution)
    (of whole market vs. individual stocks)
“Financial Markets Whipsaw”: Stocks and Corporate Bonds

- March 2020 shivers followed by strong recovery
  - **Stock market** record heights – IPOs like during NASDAQ bubble

*Record IPOs due to SPACs*
“Financial Markets Whipsaw”: Stocks and Corporate Bonds

- March 2020 shivers followed by strong recovery
  - **Stock market** record heights – IPOs like during NASDAQ bubble
  - **Corporate bond market**  

**CB: Tail risk removal**

- Large corporation paid back bank loans (from drawn credit lines)
- Freed up risk-bearing bank capital by banks for lending to SMEs
“Financial Markets Whipsaw”: US Treasury

- March 2020 shivers followed by strong recovery
  - Gov. bond market shivers
  - CB: Market maker of last resort to preserve safe asset status
    - What’s a safe asset? Precautionary savings: Asset Price = $E[\text{PV(cash flows)}] + E[\text{PV(service flows)}]$.
    - Good friend: can sell at high price and low-bid ask spread in crisis times

![Graph showing Lacking Market Making Capacity]
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Outline of Book

- Part I: Society and Resilience
- Part II: 4 Elements of Resilience Management: COVID
- Part III: Macro Resilience
  - Innovation boost vs. Scarring
  - Financial whipsaw
  - Public Debt
  - Inflation whipsaw
- Part IV: Global Resilience
  - EMDE
  - Geopolitics, World order, Global finance, Value chains, Climate
Thank You
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Pre: mutual interdependencies to ensure peace
make wars expensive

Trade: Global Value Chains, “just-in-time”
Trade bring (political) change – “Wandel durch Handel”
⇒ low π

Post: Resilience: “just-in-case”, autarky, self-reliance
More than slowbalization (?) - sanctions

02/24/22 Watershed Moment on Global Economic Order
The Future of Globalization (Slowabilization)

- “Slowbalization” (in trade), Deglobalization (in services, technology transfers)

- From **cost minimization** to **Resilience**
  - **Just-in-Time**
  - **Just-in-Case**

- **Cheap**
- **Reliable/sustainable**
- Cheapest supplier/country
- 3 different suppliers (**multi-sourcing**) from 3 different continents

Fragmentation via “Friend-shoring”

GVC Stresstests
02/24/22 Watershed Moment on Global Economic Order

- **Pre:** mutual interdependencies to ensure peace, make wars expensive
  - **Trade:** Global Value Chains, “just-in-time” → low $\pi$
  - **Trade** bring (political) change – “Wandel durch Handel”
  - **Finance:** Cross-border investments – open capital account
    EM $-reserve holdings to offset capital outflows → low $r$

- **Post:** Resilience:
  - **Trade:** “just-in-case”, autarky, self-reliance
  - **Finance:** capital controls, fewer EM $-reserves → higher $\pi, r^*$
    - + green transition
    - + Covid shock in China

- Fork in the road”: Reshoring, friend-shoring or multi-sourcing
Working from Home and city design

- Working from home: shift – stigma removal

- Donut effect due to Covid for metropolitan areas
  - City centers are struggling, suburbs thriving

- Smart cities
  - Digitalization – New form of hygiene management (like sewage in 19th century)
Global Resilience

- Emerging Economies
  - Poverty trap
    - Resilience to bounce back after a shock
  - Middle-income trap

- Floating exchange rate as resilience enhancer
  - If debt in domestic denominated currency

- Capital flows and US monetary policy

- Global safe asset – resilience for advanced economies

- Sovereign Debt Restructuring, IMF’s SDR, ...
Pre: mutual interdependencies to ensure peace
make wars expensive

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  - EM $-reserve holdings to offset capital outflows ⇒ low \( r \)

- **Post:** Resilience: “just-in-case”, autarky, self-reliance
  - More than slowbalization (?) - sanctions
  - End of “peace dividend”, rearmament
  - + green transition ⇒ higher \( \pi, r^* \)
  - + Covid shock in China
  - More capital control (?) ... fewer $-reserves
“Inflation Whipsaw”

- **2 traps** ("resilience destroyers")
  - Deflation trap
  - Inflation trap (fiscal + financial dominance)

- **Independence** central bank
  + MacroPru
  - Accelerator and breaks
Supply shortages relative to demand excesses
- Record imports from China + now: inflation in “core services”

To bring inflation down – avoid de-anchoring of inflation expectations
Taylor Principle $\phi_\pi > 1$, i.e. real rate $r^\$ \text{ increase}$
- High debt level: debt sustainability $\Rightarrow$ financial instability
  MoPo more sensitive/error prone
- MoPo spillovers to EMDC $\Rightarrow$ Flight-to-Safety - SS (loss of (local) safe-asset status)
  $r_{EM}^E < g_{EM}^E$ to sustain local EMDC safe asset
  $r_{EM}^E \uparrow \geq r^\$ \uparrow$ to be attractive relative to US Treasury
International: Flight to Safety

- Risk-on, Risk-off 
  Flight-to-safe asset 

- Problem: Safe asset is *asymmetrically supplied* by AE 
  Flight-to-safety \( \rightarrow \) cross-border capital flows
International: Flight to Safety

- Risk-on, Risk-off  Flight-to-safe asset

- Problem: Safe asset is *asymmetrically supplied* by AE
  Flight-to-safety  cross-border capital flows

- At times of global crisis, issuance of new debt
  - For AE  at inflated prices  eases conditions
  - For EME  at depressed prices  worsens conditions

- Question: Who insures whom?  “*Poor insure rich Paradox*”
  - Correct insurance only if buffer is large and debt long-term enough so that no new debt issuance needed & sell safe asset/reserves instead
Two Approaches

- **Approach 1: “Buffer Approach”** *(traditional)*
  - Lean against sudden stop (flight-to-safety) capital outflows
  - Precautionary Reserves
  - IMF liquidity lines
  - Central Banks Swap line arrangements

- **Approach 2: “Rechanneling Approach”** *(new proposal)*
  - “Global Safe Asset from & for Emerging Economies”
  - with Lunyang Huang
1. “Buffer Approach” via Reserves Holdings

- South East Asia crisis 97/98: Sudden Stop/Flight-to-Safety ⇒ precautionary reserves
- **Negative carry** due to low yield of safe asset (exorbitant privilege)
  - As EME grows faster, they have to keep acquire foreign safe assets (export surplus required)
- Distorts exchange rates
- Subsidizes private carry trades
  - Carry traders undermine/undo official reserve holding

- EME corporate sector $-borrowing
  - Bruno & Shin 2016
- Hungarian/Polish household €-borrowing
  - Verner 2017
Two Approaches

- Approach 1: “Buffer Approach” *(traditional)*
  - Lean against sudden stop (flight-to-safety) capital outflows
  - Precautionary Reserves
  - IMF liquidity lines
  - Central Banks Swap line arrangements

- Approach 2: “Rechanneling Approach” *(new proposal)*
  - “Global Safe Asset from & for Emerging Economies”
    - with Lunyang Huang
    - (Central Bank of Chile Conference 2017)
  - formal analysis
2. Approach: “Rechanneling”

- Address root cause: Safe asset is supplied asymmetrically

![Diagram showing a Pool of Sovereign Bonds]
2. Approach: “Rechanneling” with GloSBies

- Address root cause: Safe asset is supplied asymmetrically
- Create globally supplied safe asset via pooling & tranching
2. Approach: “Rechanneling” with GloSBiies

- Address root cause: Safe asset is supplied asymmetrically
- Create globally supplied safe asset via pooling & tranching

- Expand ESBiies idea for euro area to EME: “SBBS (Sovereign-Bond Backed Securities) for the world”
  Euro-nomics group 2011, 2016, 2017
International: Flight to Safety

- Risk-on, Risk-off → Flight to safe asset

- Channels back some of flight-to-safety capital flows
  - fewer cross-border capital flows

- Question: is buffer large (long-term) enough s.t. no new debt issuance needed & sale off safe asset
Self-stabilizing Global Financial Architecture

- High Debt Level
  - Domestic Challenge: Central Bank independence
  - International Challenge: Flight-to-Safety

- Global Financial Architecture
  - Buffer approach interventionistic
  - Reserve holding costly due to cost of carry & distortionary
  - IMF support very limited
  - Swap lines Limited (not all IMF member countries)
  - Rechanneling approach self-stabilizing (autonomous)

- Tranching completes the market
  - Allows catering to investors groups with different risk attitudes
  - Makes EME less crisis prone

- International pooling and tranching
  - SBBS/ESBies for the world
  - Expands WorldBank/IMF’s fire power
Climate Change
Sustainability and Resilience
Sustainability

- Resilience + is not enough
- No adverse trend

Resilient, but adverse trend $\Rightarrow$ not sustainable
Climate Change Challenge

- Global Lockdown in 2020
  - Reduction of CO2 emission was minimal

- Three-prong strategy
  - Mitigation - electric vehicles
  - Adaptation – high-tech dikes
  - Amelioration – geoengineering

- Double-externality: R&D and pollution
  - “Climate Clubs”

- Chicken-Egg problem (QWERTY)

Climate change understanding counterfactual
Resilience strategy is more likely: Let climate change show up
Risks and Climate Change

- Types of risks
  - Directly from **climate events**
  - Uncertainties of **existing** climate policies
  - Uncertainties of **future** climate policies

- Incorporated in
  - Stress tests
  - Internal Capital Adequacy Assessment Process (ICAAP)
  - Portfolio of insurance companies, institutional investors, asset managers
  - Parallel and integrated climate and macro scenarios

See Brunnermeier and Landau (2021). “Finance, Money, and Climate Change” (Economic Policy)
Risks and Climate Change: Stranded Assets

- Types of risks
  - Directly from climate events
  - Uncertainties of existing climate policies
  - Uncertainties of future climate policies
  - "Climate risk dominance" analogous to "financial dominance"

- Limited (Strict) Climate risk provisioning
- Strong (limited) Political resistance and lobbying
- Limited (lots of) "stranded assets"

"stranded assets" justifies
Green finance: Conceptual issues

- Distorting **wrong adjustment margin**
  - \( Y = A \mathcal{F}(\text{Labor, Capital, Pollution}) \)
    - Distort labor capital ratio -> tilt towards less capital intensive production
    - Risky firms: distort more

- **Price on resource vs. price on risk**

- **Policy uncertainty “tax”** (legislation risk premium)
  - Can be Pigouvian – steering towards green
  - No tax revenue – socially waisted in risk premia
    (goes to capital investors to compensate their disutility)
Resilience and Time Inconsistency

- **Fix**, clear policy path that removes policy uncertainties
- Pre-specified price of CO2/carbon
  - Removing uncertainty - stirs private investments (given low $i$)
  - Reduces risk premium
- Pre-specified quantity of CO2 emissions
  - Implemented with fixed tradable permits
- Interim solution: (Delpla)
  - Tradable permit which can be adjusted to stabilize CO2 price
- **Flexibility** – resilience (adapt, react, re-optimize, ...)
  - Esp. when tipping points become apparent
Innovation and Scarring

Digitalization – Life Sciences
Econ New Normal: Innovation and Scarring

- **Innovation**: Overcoming cannibalization, QWERTY problem, regulatory shackles
  - Tele medicine/Life sciences
  - Home office and real estate donut effect
  - Online learning/conferencing
  - Digital Money

- **Scarring**:
  - Belief and preference scarring (confidence)
  - Labor market scarring
  - Debt overhang
Covid and city design

- Fewer high rise buildings (lift fear)
  - From sky scrapers to office parks
  - Spread out cities ⇒ traffic
- Donut effect due to Covid for metropolitan areas
  - City centers are struggling, suburbs thriving

- Smart cities
  - Digitalization – New form of hygiene management (like sewage in 19th century)
Outline of Book

- Part I: Society and Resilience
- Part II: 4 Elements of Resilience Management: COVID
- Part III: Macro Resilience
  - Innovation boost vs. Scarring
  - Financial whipsaw
  - Public Debt
  - Inflation whipsaw
- Part IV: Global Resilience
  - EMDE
  - Geopolitics, World order, Global finance, Value chains, Climate
Resilience and Policy Implications

- **Health**
  - Vaccines to return to “new normal”

- **Education**
  - Foster taking initiatives, general and life-long education, no comparisons to others,

- **Macro**
  - Low interest rate ⇒ more fiscal, less monetary resilience

- **Finance**
  - Efficient debt restructuring -- Capital requirements (buffers) (to avoid debt overhang)
Resilience and Policy Implications

- **Health**
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![Diagram](image)

“robust”/resistant until it breaks through “Robustness barrier”
Resilience and Policy Implications

- **Health**
  - Vaccines to return to “new normal”

- **Macro**
  - Low interest rate ⇒ more fiscal, less monetary resilience

- **Finance**
  - Efficient debt restructuring -- Capital requirements (buffers)
    (to avoid debt overhang)
  - Distributed Ledger Technology (DLT)

- **Resilience Inequality** ⇒ income and wealth inequality

- **Emerging Economies** – poverty and middle income traps

- **International Macro-Finance**
  - Flexible exchange rate – Foreign exchange reserves (buffers)
    + MacroPru (limited $-debt)
  - Poor insuring the rich: “GloSBies” and Global Role of the US dollar as safe asset

- **International Trade: Global value chains**
  - From “just in time” to “just in case” -- stress tests for GVC (resilience lessons from GFC)

- **Global geopolitics** – cyber warfare

- **Climate change** – Sustainability = resilience + no adverse trend
A Personal Conjecture

- In an increasingly complex society

- **Autocratic societies**
  - Seek **robustness** – attractive feature after crises
  - Suppression, minimize movements/disruptions
  - Surveillance
  - Tighten with each crisis ... no rebound

- **Open/democratic society**
  - More **resilient**
  - May appear wobbly when shock hits but internal mechanism allow for rebound
  - Open to mavericks
  - Transparency and more information flow/aggregation

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**Good in**

- **Enforcing rules**

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**Invented universally accepted vaccines**
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Resilience and the Slope of the Yield Curve

- Resilient path

Resilience and the slope of the yield curve
- Increasing $\Rightarrow$ resilience (V recessions)
- Flat $\Rightarrow$ random walk (permanent)
Resilience: Debt vs. Equity

“robust”/resistant until it breaks through “Robustness barrier”

Equity

Debt

Runs

Tax revenue
Resilience enhancer: Bankruptcy Protection

- Bankruptcy in US:

  - Distress
    - Bankruptcy
      - Chapter 11: 15.6%
      - Reorganization & Continuation: 10.2%
    - Liquidation: 8.3% of all firm closures
  - Out of Court
    - Chapter 7: 84.4%
    - Stop operating without bankruptcy: 91.7% of all firm closures
    - Renegotiation & Continuation

Source: Greenwood, Iverson, Thesmar 2020
“Financial Markets Whipsaw”

- Robustness: Equity capital = buffer/redundancies
- Resilience: Efficient Debt Restructuring
  Lender of last resort by central banks
“Financial Markets Whipsaw”: Stocks and Corporate Bonds

- March 2020 shivers followed by strong recovery
  - **Stock market** record heights – IPOs like during NASDAQ bubble
  - **Corporate bond market**

CB: Tail risk removal

Record **corporate bond issuance**

Large corporation paid back bank loans (from drawn credit lines) Freed up risk-bearing bank capital by banks for lending to SMEs
“Financial Markets Whipsaw”: US Treasury

- March 2020 shivers followed by strong recovery
  - Gov. bond market shivers  
    - CB: Market maker of last resort to preserve safe asset status
      - What’s a safe asset? Precautionary savings: Asset Price = E[PV(cash flows)] + E[PV(service flows)]
        - Good friend: can sell at high price and low-bid ask spread in crisis times

![Chart showing Lacking Market Making Capacity](image-url)
Fiscal Inflation Link