

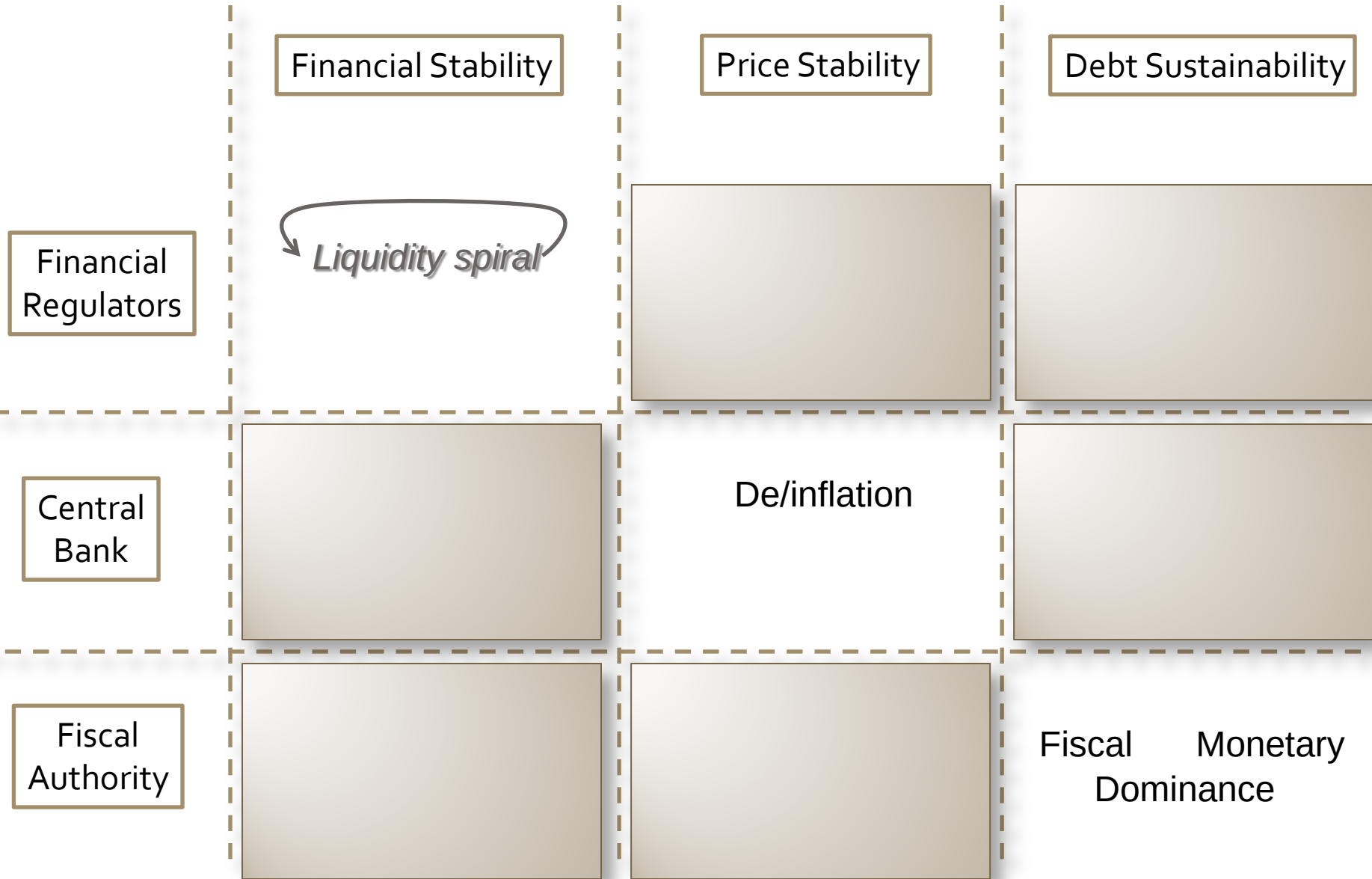


MONETARY AND MACRO-PRUDENTIAL POLICY IN A CURRENCY UNION

MARKUS BRUNNERMEIER

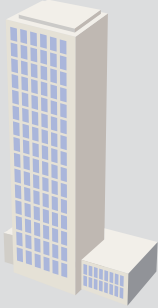
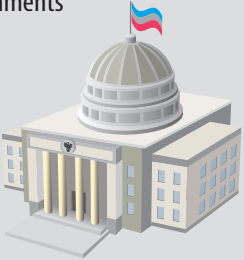
Princeton University

Bank of Spain, Madrid, June 17th, 2013



Actors:

Three Stability Concepts:

Policy	1. Financial Stability	2. Price Stability	3. Debt Sustainability
Prudential Policy Financial regulators 			
Monetary Policy Central banks 			
Fiscal Policy Governments 			

Overview

- Financial Stability & Systemic Risk
- ... and Price Stability *financial dominance*
 - Force: Fisher Debt Deflation
 - Redistributive Role of Monetary Policy
- ... and Fiscal Debt Sustainability *fiscal dominance*
 - Diabolic Loop
 - Opposing inflationary and deflationary forces
- In a Currency Union

|| The 2 Components of Systemic Risk

1. **TIME SERIES** - Procyclicality
Systemic risk build-up during (credit) bubble
2. **CROSS-SECTION** - Propagation
Spillover and contagion

Micro-prudential view	Macro-prudential view
Exposure to potential losses	Spillover to others





TIME DIMENSION	MicroPru	MacroPru
<u>Mitigation</u>	Most tight in crisis	Most tight in run-up
Low exogenous volatility	good	build-up of systemic risk (volatility paradox)
Financial innovation	good lowers idiosyncr. risk	mixed raises systemic risk
		<i>Same political economy challenges as Monetary Policy</i>

CROSS SECTION	Microprudential	Macprudential
View	Partial Equilibrium	General Equilibrium
Risk	Risk in isolation (VaR)	Risk of system (CoVaR)
Distortions - causes	Socialization of losses	Externalities/spillovers $\frac{\partial u^i}{\partial a^j}$ $\frac{\partial^2 u^i(a^i, a^j)}{\partial a^i \partial a^j}$ - Amplification/endog. risk - Financial cycle/ procyclaclity
- results	- Excessive risk taking "hide risk in tail" - Gamble for resurrection	- Excessive systemic risk "create tails" - Herding/irrational fashions/bubbles
- objective	Diversification	Diversity



CROSS SECTION

MicroPru

MacroPru

Policy instruments

- Quantitative restrictions

%



\$

Smart ratio: $\frac{equity_t}{total\ assets_{t-x}}$

- Price tools/taxes/levies

Tax + allocation of tax

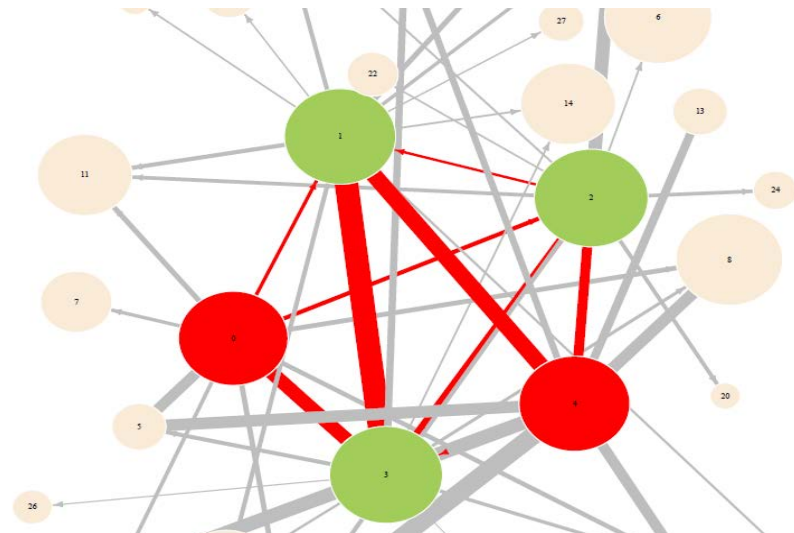
- communication

|| The 2 Components of Systemic Risk

1. Systemic risk build-up during (credit) bubble
 - “Volatility Paradox” → contemp. measures inappropriate
 - Financial innovation/liberalization → more systematic risk
2. Spillovers/contagion – externalities

- **Direct** contractual: domino effect (interconnectedness)

- Network effects
- Bankruptcy of bank A leads to default of B
 - 1st, 2nd, 3rd round effects
 - Random recovery rate



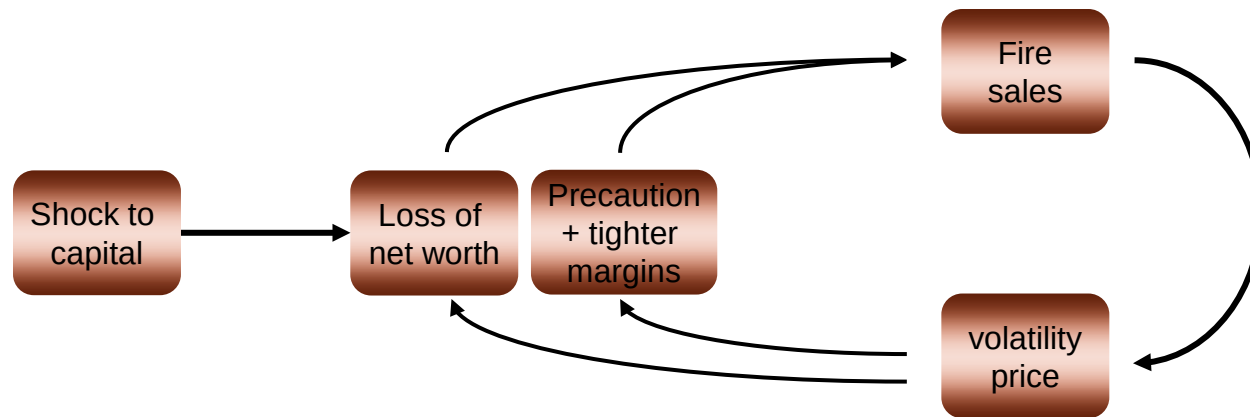
- Indirect:

preventive

crisis management

|| The 2 Components of Systemic Risk

1. Systemic risk build-up during (credit) bubble
 - “Volatility Paradox” → contemp. measures inappropriate
 - Financial innovation/liberalization → more systematic risk
2. Spillovers/contagion – externalities
 - Direct contractual: - domino effect (interconnectedness)
 - Indirect:
 - price effect (fire-sale externalities)
 - credit crunch, **liquidity spirals**



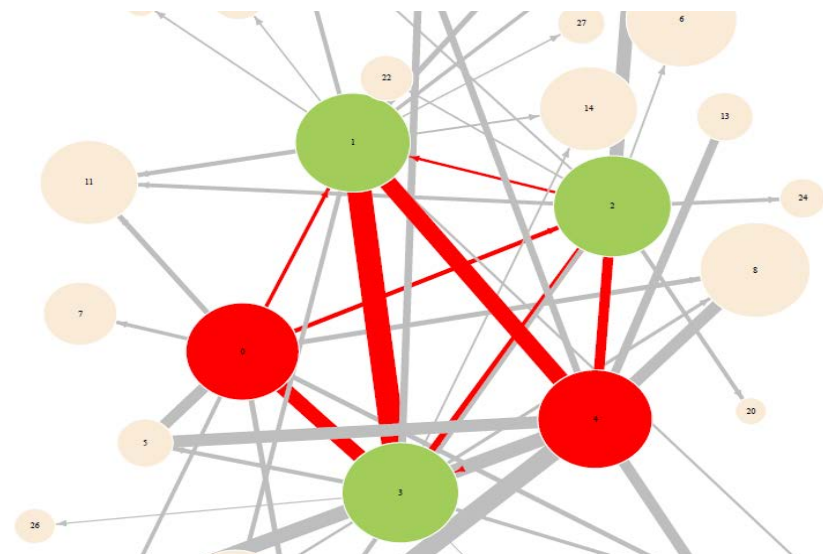
- information spillovers

preventive

crisis management

|| Absorber vs. amplifier

Direct	Indirect
Contractual links	"Virtual links"
Loss through bankruptcy/default	Similar exposure than other levered players
Position data	Response indicator - expectations/ constraints



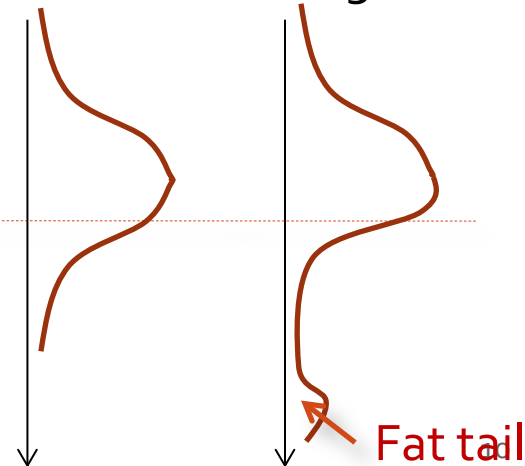
Distribution

exogenous

endogenous

■ Shock **absorber**

■ Shock **amplifier**



Fat tail

|| Absorber vs. amplifier indicator: LMI

- **Liquidity mismatch** – not maturity mismatch

A	L	
□ Market illiquidity ▪ Price impact	Funding illiquidity rollover risk/ haircut sensitivity	
	Micro-prudential	Macro-prudential
Market Illiquidity	exogenous	depends on funding structure of other holders

- Risk topography
 - Δ value along risk factors
 - Δ LMI sensitivity

See Brunnermeier, Gorton & Krishnamurthy 2012

Policy: Zombify vs. Liquify

- **Forbearance** leads to **ever-greening** & lack of liquidation of existing positions, restructuring of legacy mortgages.
 - Japanese approach
 - Rollover loans to “zombie firms”
- **Credit crunch** for new projects and borrowers.
 - ➡ Real economy tanks
 - Evidence: see Gianetti and Simonov (AEJ Micro, 2012)

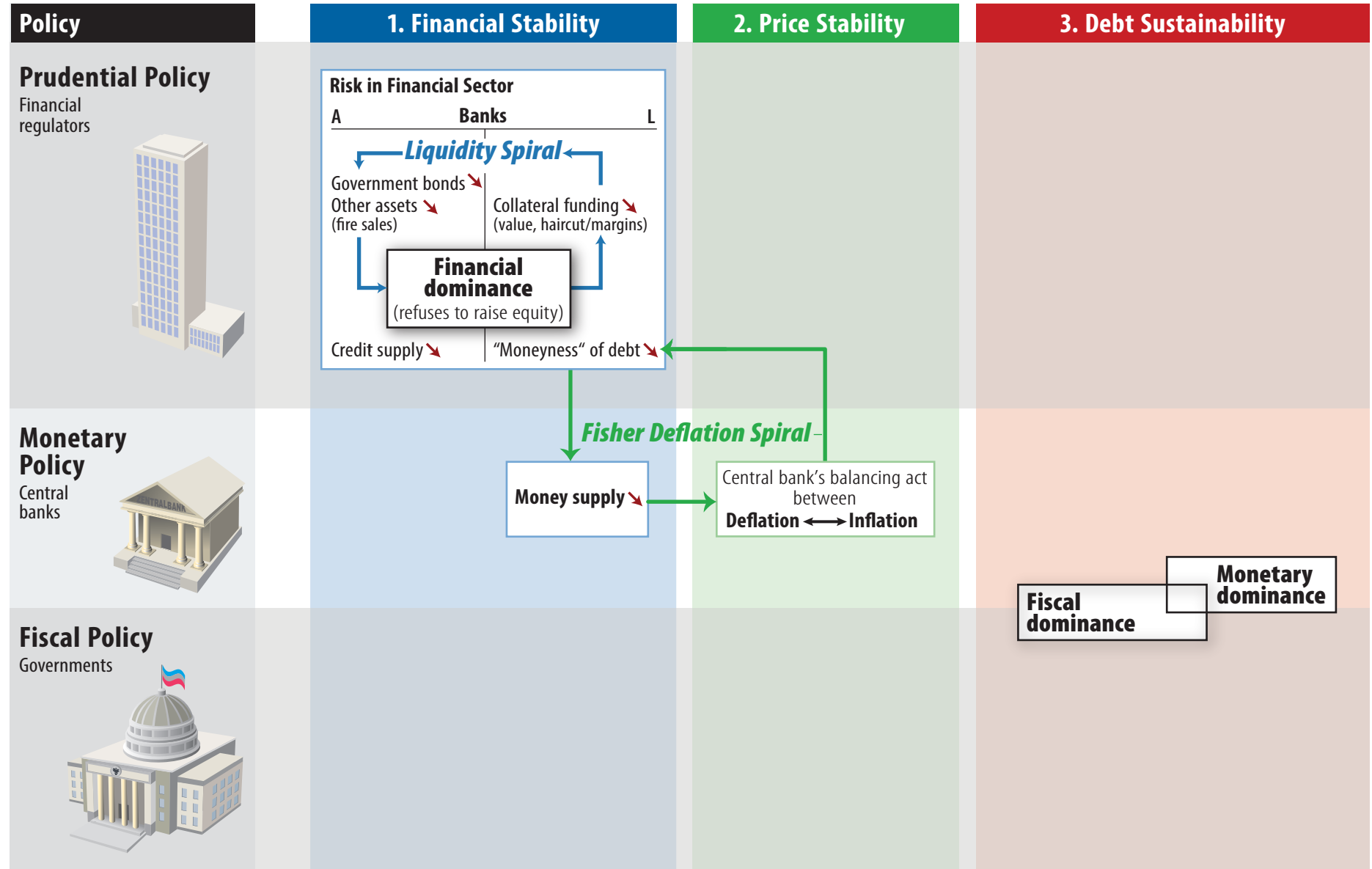
Link: Financial and Price Stability

- Passive monetary policy

- | A | L |
|---|---------------------|
| <ul style="list-style-type: none">□ Liquidity Spirals | Deflationary spiral |
- Endogenous risk
 - Redistributive effects

"The I Theory of Money"
Brunnermeier & Sannikov (2012)

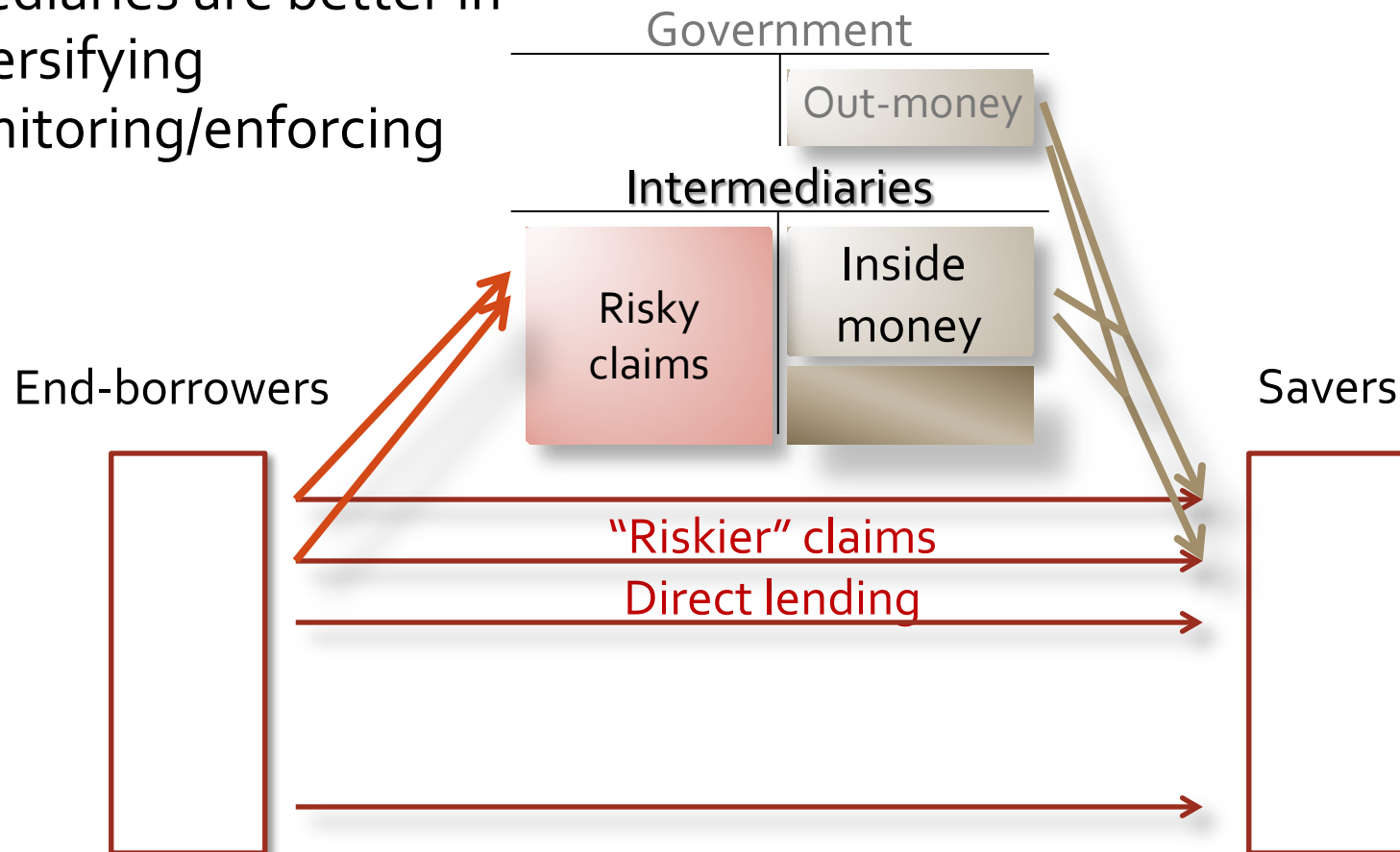
Actors:



|| A Stylized Economy

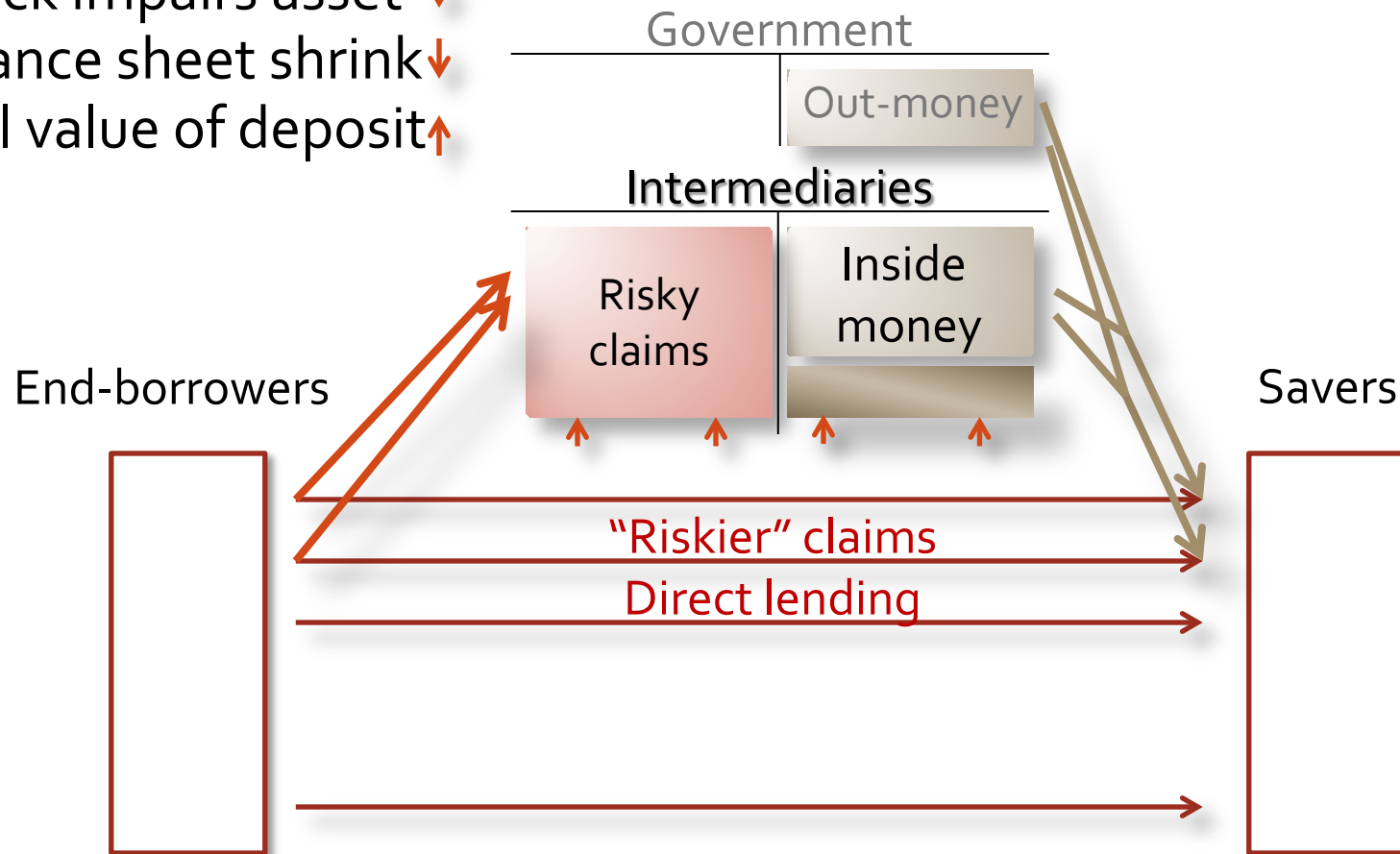
Intermediaries are better in

1. Diversifying
2. Monitoring/enforcing

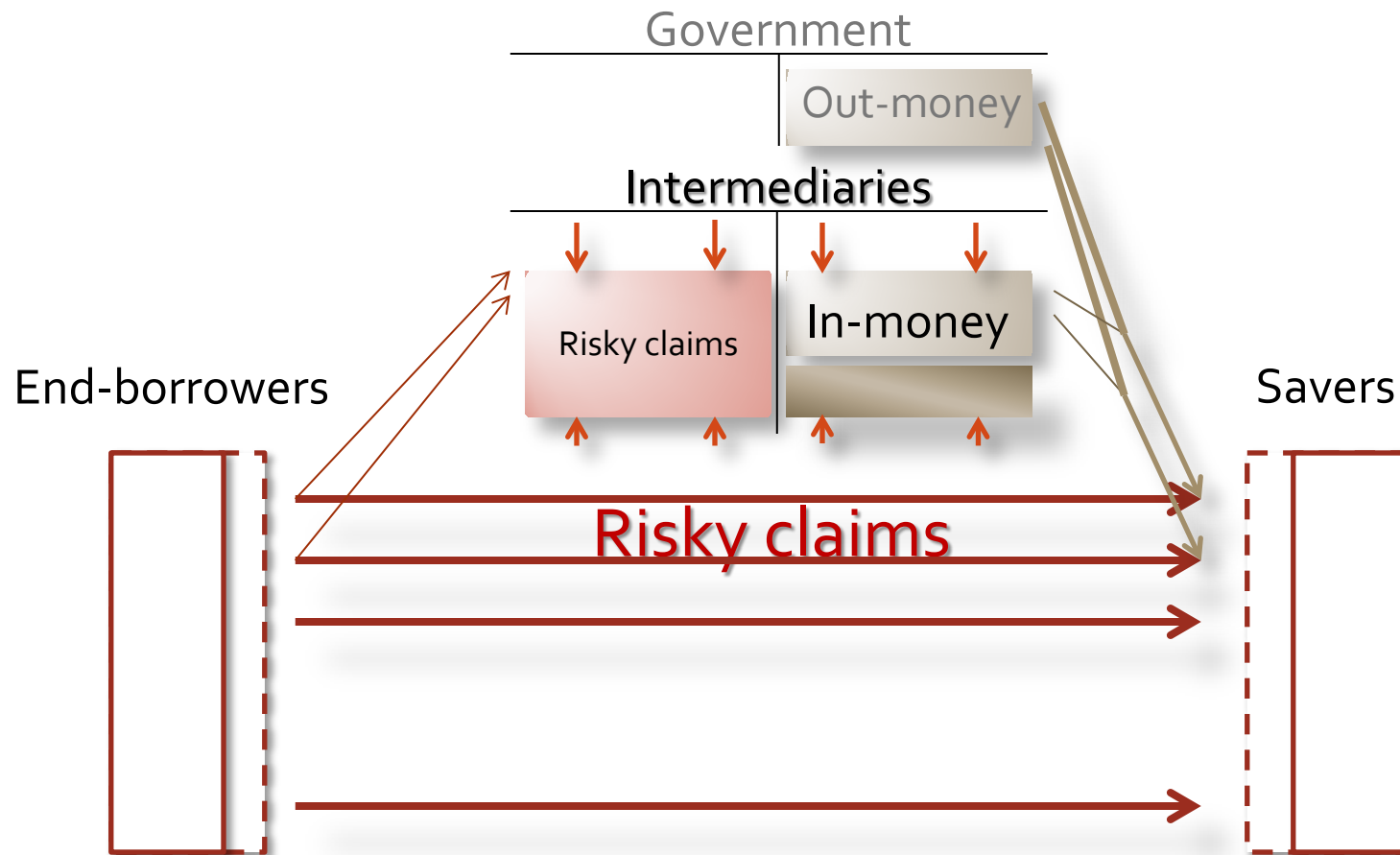


1. Shock Impairs Assets – 1st of 3 Steps

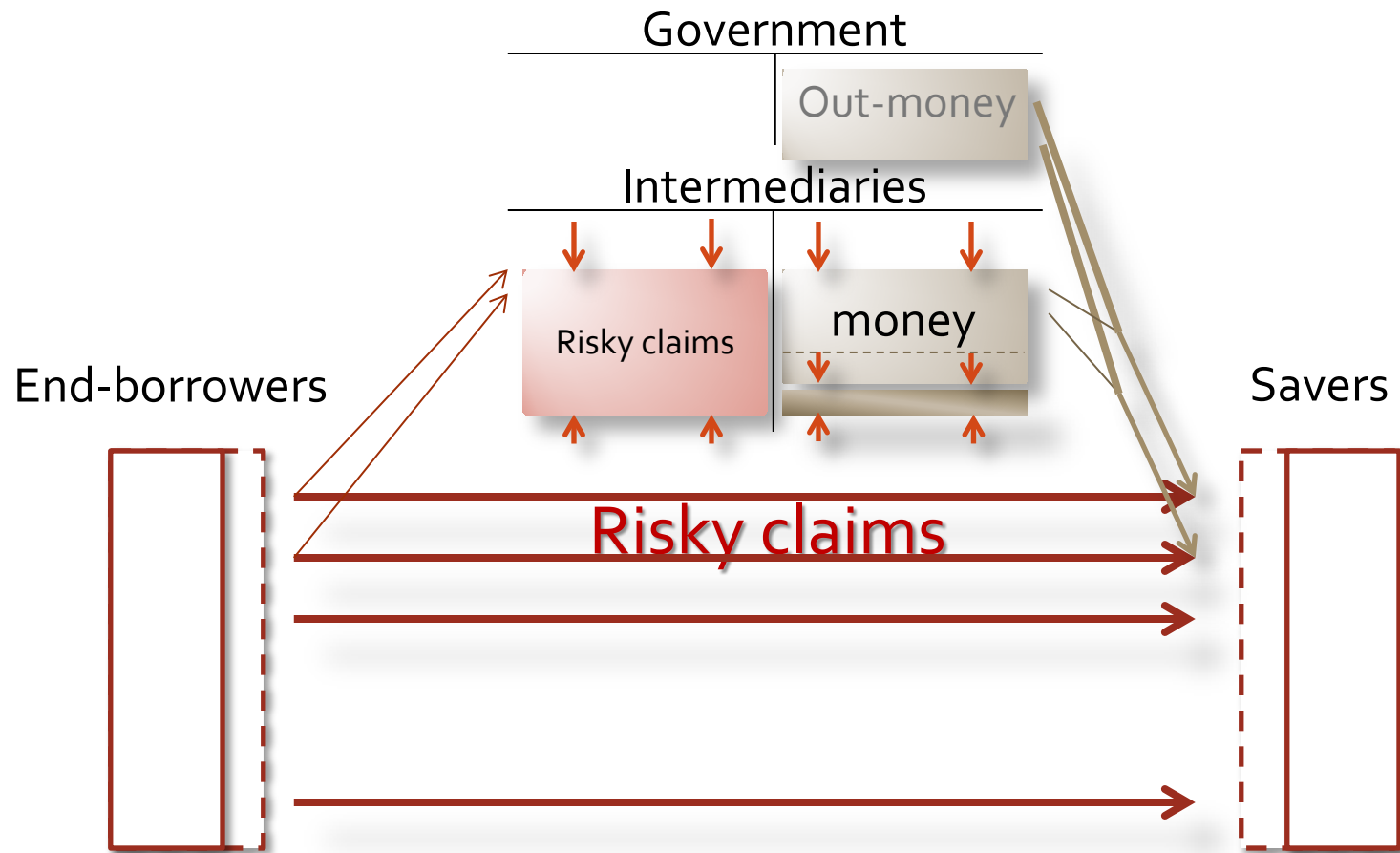
1. Shock impairs asset ↓
2. Balance sheet shrink ↓
3. Real value of deposit ↑



2. Shrink Balance Sheet: Sell off of Assets



3. Deflation Effect: Value of Liabilities Expand



After Adverse Shock

- Intermediary net worth ↓
 - **Capital:**
 - fire sales, price q ↓
 - Investment ↓
 - Allocation efficiency ↓

} Liquidity spiral
 - **Money:**
 - Lending + deposits ↓
 - value of money p ↑
 - Multiplier ↓

} Deflation spiral
 - **Banking**
 - Hit on both sides of balance sheet
 - Externality among banks
 - Competition ↓
 - Amplification/persistence
- ⇒ endogenous risk
⇒ wealth redistribution

Introducing Long-Term Bonds

Intermediaries

Risky claims	Inside money
Long-term bonds	Net worth

Monetary Policy

- As interest rate are cut in downturns, bonds held by intermediaries appreciate, this
 - protects intermediaries against shocks
 - increases the supply of asset that can be used as storage (weakens deflation)
- Because downturns are softened, for all η
 - drop in financial sectors' capitalization conditional on a shock ↓
 - price of capital ↑
 - money multiplier ↑
 - price of money ↓
 - intermediary allocation to capital ↑
 - household allocation to capital ↓
 - risk premia (and thus the rate of recovery, conditional on no shocks) ↓

Policy – in general

- Limit/undo wealth redistribution due to endogenous risk
- Permanent losses
 - Wealth redistribution
 - default
 - “anti-deflation” policy, inflation
 - Risk redistribution
 - contingent wealth redistribution
- Temporary shortage
 - Liquidity policy
- Policy uncertainty
 - Commitment - reduces risk premia
 - Flexibility – react optimally to reduce risk

|| (Tail) Risk Redistribution

- Central bank “assumes” tail risk
- Risk redistribution = future contingent wealth redistr.
- Purchase programs – upside and downside
 - Interest rate risk
 - Credit risk
- Lending programs – only downside
 - Joint event: insufficient collateral & failed counterparty
 - Collateral policy changes tail event
- Policy: Manage risk premia

Financial Dominance

- Financial Sector threatens to strangles real sector if not recapitalized through
 - Fiscal measures – explicit bailout
 - Active monetary policy – “stealth” recapitalization
 - Interest rate
 - Current rate
 - Forward guidance
 - Asset purchase programs – open market operation
- Role of long-term bonds
 - Off-load rollover risk to financial sector
 - Conduct OMO to recapitalize financial sector

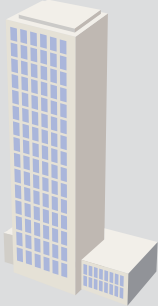
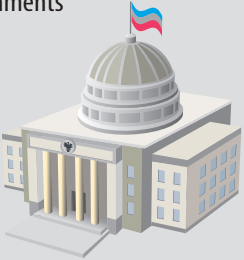
Overall Welfare of ex-post Redistribution

- Redistribution is not a zero sum game!
- When is ex-post redistribution most desirable?
 - Endogenous risk is large
 - Technological and market liquidity (redeployability) is low
 - gap between first and second best use is large
 - Exogenous risk is small!

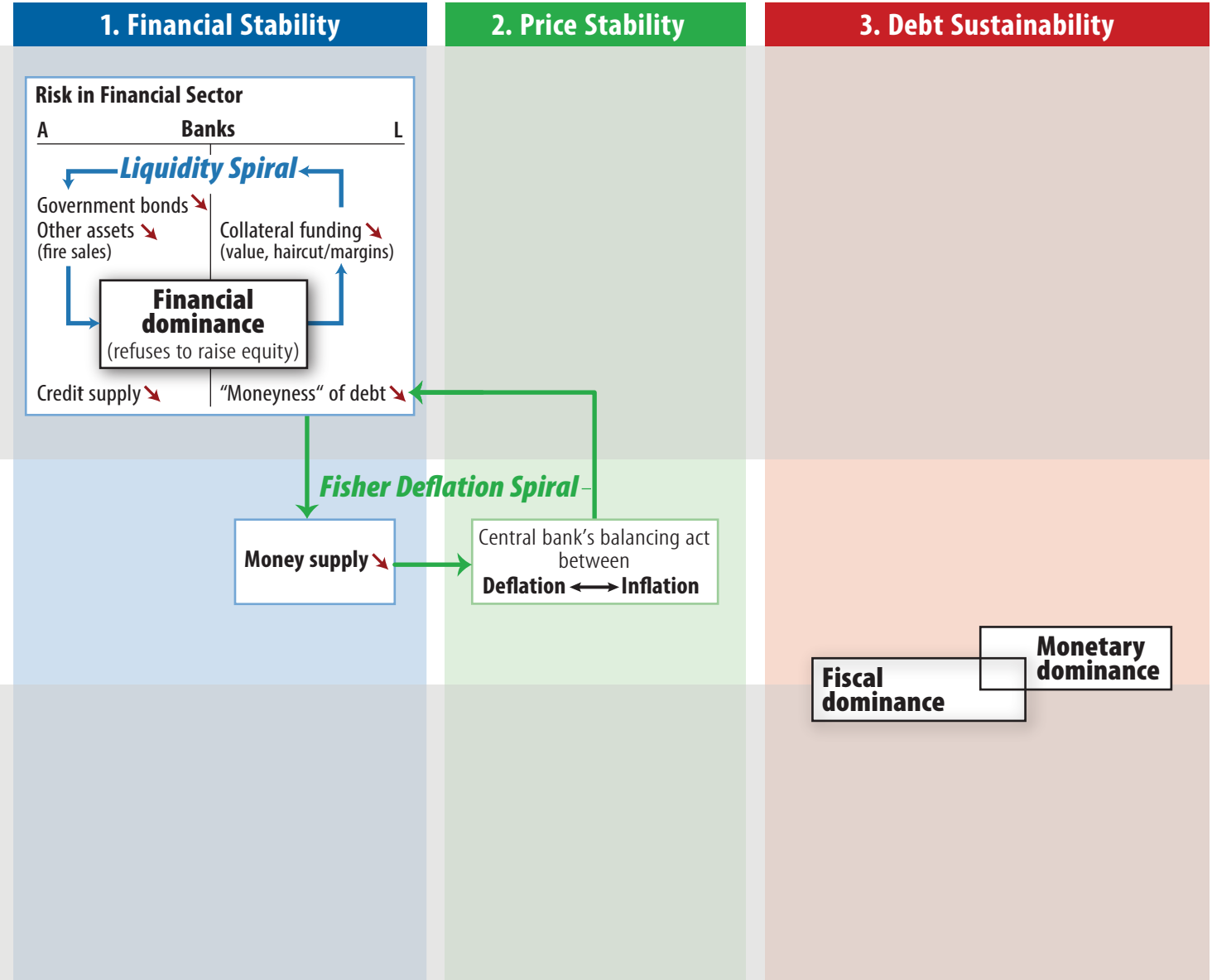
Ex-ante Monetary Policy

- Implementation problem
- “Insurance agreement” across sectors
 - completes markets
- Moral Hazard – limits “implementable” rules
 - Punish the weak and strengthen the cautious within sector
 - Interest rate rule is not sufficient
 - Target excessive spreads
 - Combine with macro-prudential (quantitative) rules (LTV, haircuts,...)

Actors:

Policy	
Prudential Policy Financial regulators 	
Monetary Policy Central banks 	
Fiscal Policy Governments 	

Three Stability Concepts:



|| Link: ... & Fiscal Debt Sustainability

- So far, Government bond was default-free
 - Now: “fear” of default
- Fiscal dominance
 - Willingness of government (fiscal authorities) to balance long-run budget might be limited
- Monetary dominance
 - Willingness of monetary authority to print money might be limited
- ⇒ possible default on government debt
 - Risk premium on default risk ⇒ Diabolic Loop

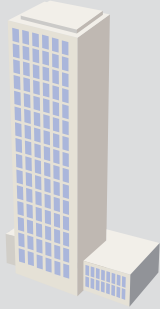
Game of chicken

Actors:

Policy

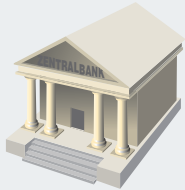
Prudential Policy

Financial regulators



Monetary Policy

Central banks



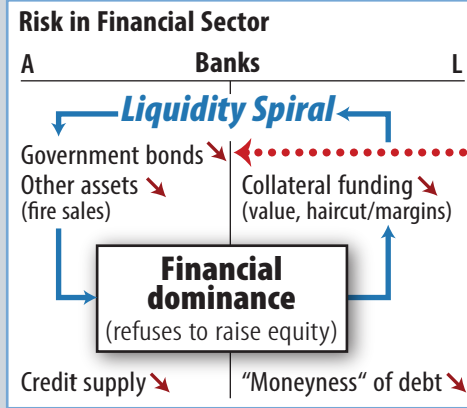
Fiscal Policy

Governments



Three Stability Concepts:

1. Financial Stability



Fisher Deflation Spiral

Money supply

Central bank's balancing act
between
Deflation ↔ Inflation

GDP

— due to credit crunch
— due to increased uncertainty

2. Price Stability

3. Debt Sustainability

Risk of Government Debt

Government bonds' value
Risk premia

Diabolic Loop/Spiral
between government
and financial risk

Inflation
Default
lower long-run
expenditure/GDP

Fiscal dominance

Monetary dominance

Tax revenue
Bank bailout probability

|| Opposing De- and Inflationary Forces

- Difficult to balance
- System is very unforgiving towards small mistakes

|| Opposing De- and Inflationary Forces

- Difficult to balance
- System is very unforgiving towards small mistakes



- Divergence in inflation expectations
- Possibly high inflation risk premium

Preventive Monetary Policy

- Early warning signals
 - Credit growth and imbalances
- Volatility Paradox + Financial Innovation
- Quantity controls
 - Through macro-prudential tools
 - LTV, ...

Overview

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Game of Chicken

- 17 fiscal authorities vs. 1 central bank
- Delay
- Ex-ante rules vs. ex-post discretion

What's a Country?

- Traditional view – (country or region?)
 - Same price/wage stickiness
 - Non-tradeables are only tradeable within country
 - Same shock
- Fiscal view (joint tax, borrowing & spending authority)
- Financial frictions view
 - MacroPru – coordinated but not the same
 - Financial sector
 - Common bailout/resolution in bad times & tax revenue in good times
 - Same foreclosure laws
 - Same safe asset - ESBies (not joint & several liability)

MacroPru: Optimizing a Currency Union

- Use **regional** ...
 - Collateral policy (haircuts)
 - E.g. haircuts for mortgages in country X (with housing boom) are higher
 - Macroprudential regulation (through ESRB)

as an active policy instrument

- Too lean against **regional** bubbles/imbalances

➡ Justifies larger currency area, but needs clear governance structure

- See Brunnermeier (2010) "Optimizing the Currency Union" (ECB book)

➡ MacroPru should be close to the ECB (more than MicroPru)

- "take the punch bowl away when party gets going"

Financial Union

1. What **taxing/bailout model**?

- in good times: tax revenue/credit to national level (IR, L, Cyp)
- in bad times: cost to European tax payer

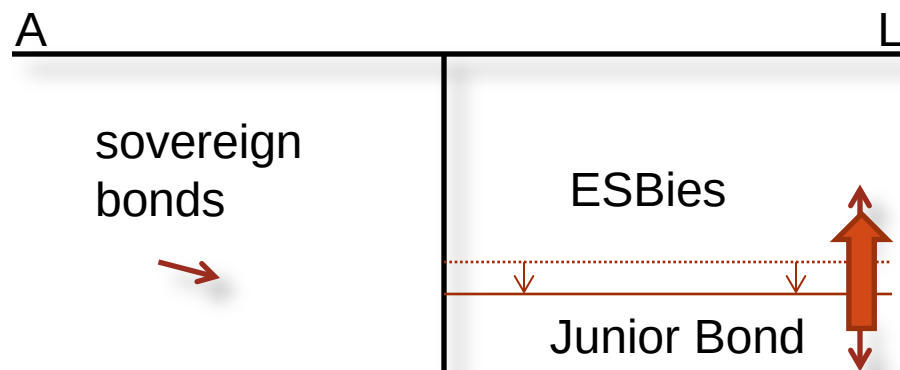
2. **Subsidiaries vs. branches?**

- EU-wide liquidity management?
- Ring-fencing all the time
vs. “race to ring fence” in times of crisis (externalities)

|| Aims of the Financial Union

- Common regulatory standard and info sharing
 - Efficient resolution – prompt corrective action
 - Avoid externalities due to a “race to ring fence”
- Protect ECB from being forced to monetize losses
 - ECB needs trigger to initiate bank restructuring
- Break diabolic loop between banking & sovereign risk
- Loss sharing – common backstop
 - For tiny crisis common deposit insurance
 - For systemic crisis fiscal taxing power

Safe Asset: ESBies



*Flight to safety asset is endogenous
(coordination problem)*

- Today: asymmetric shifts **across borders**
 - Value of German debt decreases
 - German CDS spread rises, but yield on bund drops (flight to quality)
 - Value of Italian/Spanish/Greek... sovereign debt declines
- With ESBies: Negative co-movement **across tranches**
 - Value of ESBies expands – due to flight to quality
 - Value of Junior bond shrinks – due to increased risk
 - Asset side is more stable

Conclusion

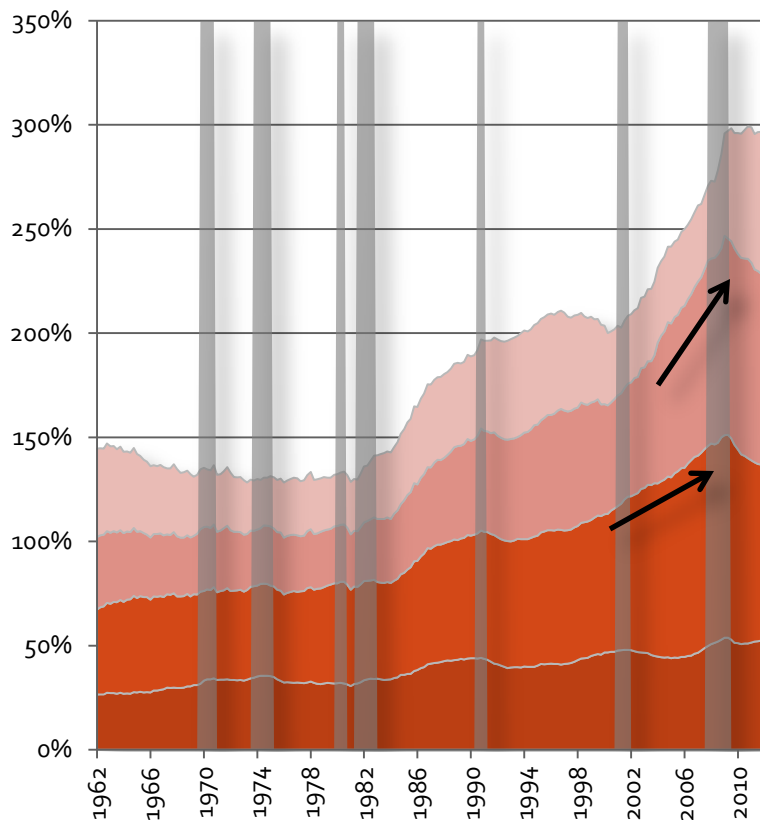
- Financial Stability & Systemic Risk
 - MacroPru similar to Monetary Policy (tough in good times)
 - Should be located at European level & central bank
- ... and Price Stability *financial dominance*
 - Redistributive Role of Monetary Policy
- ... and Fiscal Debt Sustainability *fiscal dominance*
 - Diabolic Loop
 - Fisher deflationary vs. inflationary forces
- In a Currency Union
 - Optimize currency union
 - Subsidiary vs. branch system – bailout cost vs. tax revenue

	New Keynesian	I-Theory
Key friction	Price stickiness & ZLB	Financial friction
Role of money	Unit of account	Store of value
Driver	Demand driven as firms are obliged to meet demand at sticky price	Misallocation of funds
Monetary policy - implementation - First order effects	Optimal price setting over time Affect HH's intertemporal trade-off Nominal interest rate impact real interest rate due to price stickiness	Ex-ante insurance "complete markets" Ex-post: redistributinal effects Ex-ante: insurance
Time consistency	Wage stickiness Price stickiness + monopolistic competition	Moral hazard in risk taking (bubbles) - Greenspan put -
Yield curve	Expectation hypothesis only	Term/inflation risk premia

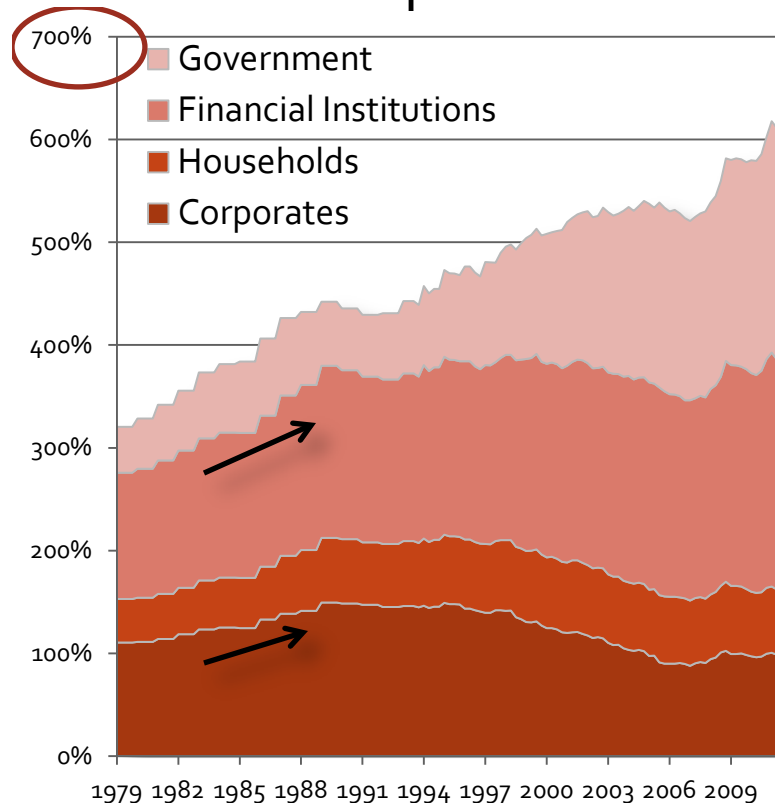


Debt Levels: Vulnerability across sectors

United States



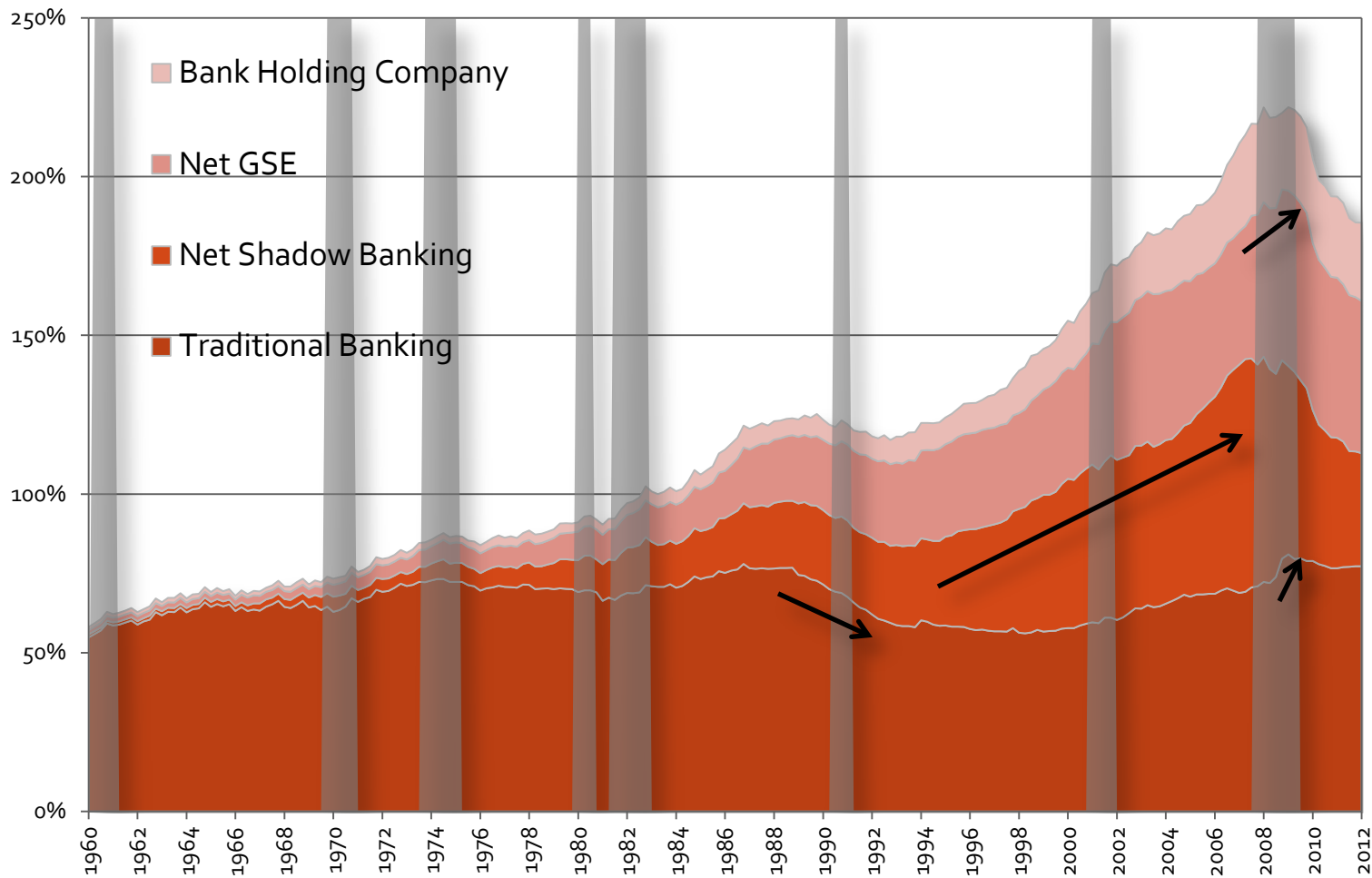
Japan



■ Different sectors

- Japan 1980s: non-fin. business sector + financial
- United States 2000s: household sector + financial

U.S. Financial Sector Debt



|| “Financial Dominance”

- Fiscal dominance (FTPL)
 - Inability or unwillingness of fiscal authorities to control long-run expenditure/GDP ratio
 - Limits monetary authority to raise interest rate
- “Financial dominance”
 - Inability or unwillingness of financial sector to absorb losses
 - Refusal to issue new equity
 - Limits policy options to guarantee price stability and fiscal debt sustainability.
 - Forces government to bail out “to give”
 - Limits “financial repression” for financial sector “not to take away”
 - Paradox: “Dominance through weakness”

Interest Rate Risk – “Rollover Risk”

- Who bears the risk of interest rate increase or “rollover risk”?

Depends on

- Maturity of Government bonds AND
- Risk bearing capacity of holders of long-term bonds

Government issues	Financial Sector is	Loss to
Long-term bond + Financial sector transforms maturity	well capitalized	to financial sector
	undercapitalized ⇒ “Empty” insurance	to Government (gain to financial sector)
Short-term bond		to Government

|| A Financial Repression Defense Mechanism

- So far,... role of long-term bonds
 - Cut interest rates “stealth” recapitalization of banks
 - Increase interest difficult if it bankrupts banks
 - More generally,
Financial dominance as a strategic defense
mechanism against financial repression
 - In times of crisis government has incentive to redistribute
- ⇒ Banks have an incentive to be vulnerable (pay out beforehand)
Otherwise they are forced to absorb losses