The Federal Reserve in the 21st Century

Financial Stability Policies

FEDERAL RESERVE BANK *of* NEW YORK

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Disclaimer

The views expressed in the presentation are those of the speaker and are not necessarily reflective of views at the Federal Reserve Bank of New York or the Federal Reserve System.

Overview

- Why care about financial stability?
  - “Upsides” and “downsides” of the financial system
- Inherent instabilities of financial institutions
  - Maturity transformation and runs
  - Solvency and liquidity
  - Pro-cyclical leverage
- Financial stability policies
  - Federal Reserve and financial stability
  - Vulnerabilities and tools by sectors
    - Asset markets
    - Banking sector
    - Shadow banking sector
    - Non-financial sector

“Upsides” of the Financial System

Financial System – Benefits

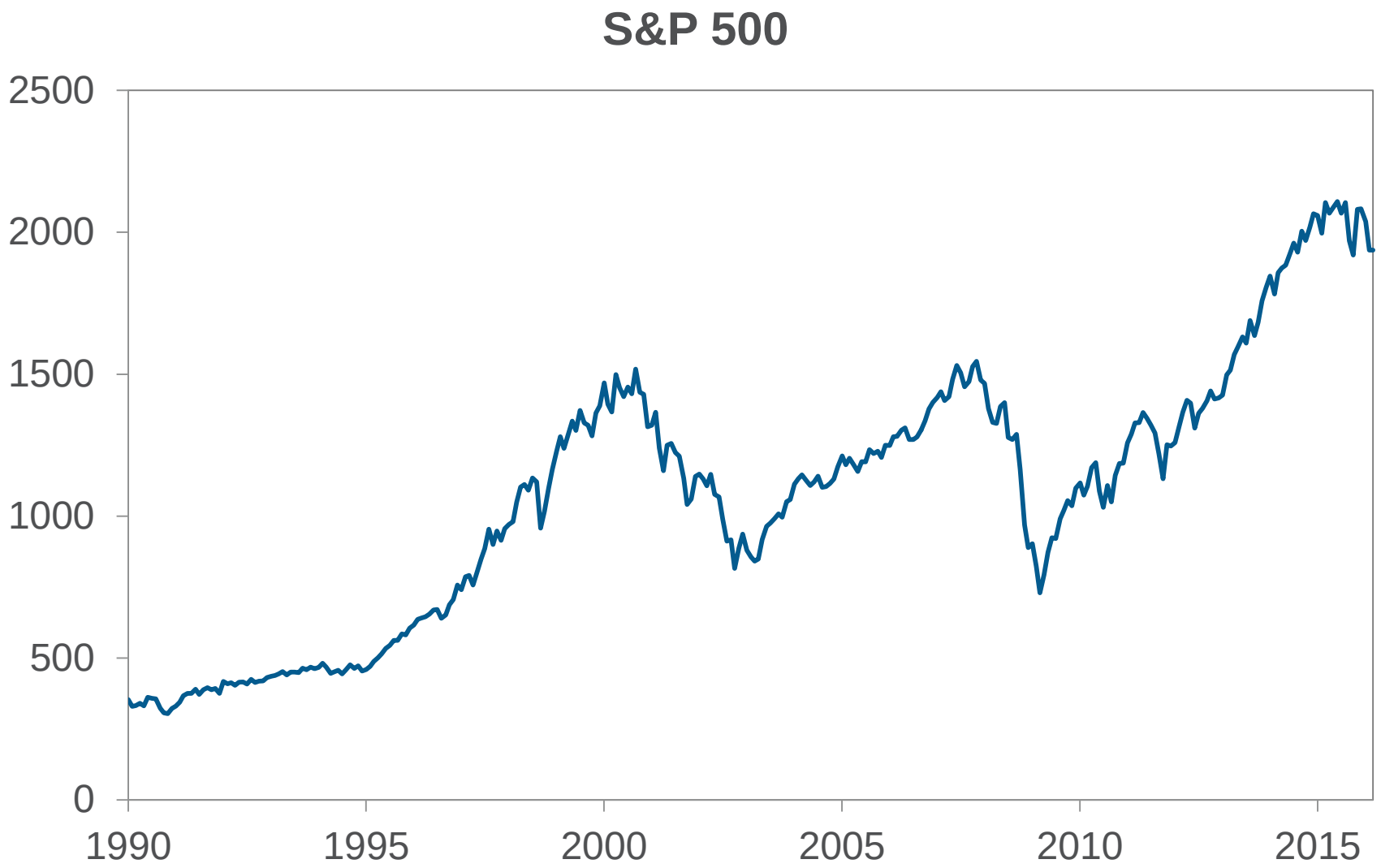
- Allocation of resources
  - *Savers to borrowers*
    Stocks, bonds, bank deposits/loans: from people who want to save to people who want to invest
  - *Across many investments*
    Asset prices, interest rates: determine where funds are most scarce and direct flows
- State-contingent exchanges
  - *Intertemporal smoothing*
    Transfer of purchasing power across time
  - *Sharing of risks*
    Different natural exposures (airline & oil producer) and different capacity to bear (retiree & young worker)

“Downsides” of the Financial System

Financial System – Costs

- **Asset bubbles**
  - Combinations of psychology and frictions can drive valuations far from fundamentals
- Credit booms
  - Borrowers taking on, rolling over debt; able to repay only under best scenario
- Worst case: combination of both
  - Rising asset prices ↔ demand for credit
- Comovement of risk premiums and risk taking

Fluctuations in Asset Valuations



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Costs of Financial Crisis

Median Outcomes of Banking Crises in Advanced Economies, 1970-2011		
Relative to GDP	Output Loss	-32.9%
	Increase in Debt	21.4%
	Fiscal Costs	3.8%
In Years	Duration	3 years

Source: Laeven & Valencia (2012)

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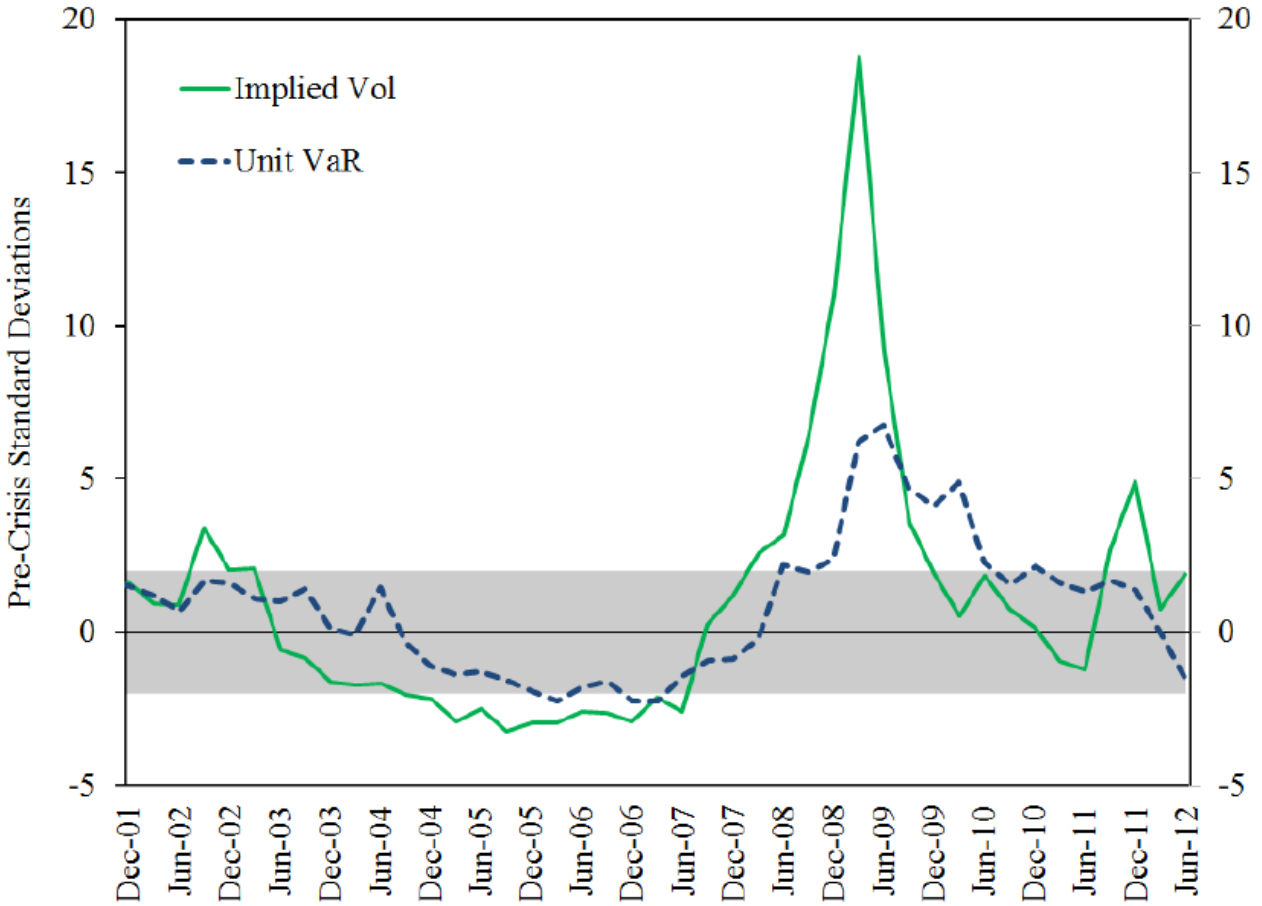
Risk Premiums and Risk Taking



Source: Adrian & Shin (2014)

Inherent Instabilities

Elements of Instability

- Financial system does not correspond to perfect market for Arrow-Debreu claims
- Frictions are important source of instability
  - Maturity transformation and runs
  - Interaction of solvency and liquidity
  - Pro-cyclical leverage
- Financial conditions interact with real activity
  - Spillovers and amplification

Maturity Transformation and Runs

Maturity Transformation and Runs

- Diamond and Dybvig (1983)
  - Long term investment: productive but illiquid
  - Agents uncertain about consumption needs: early vs. late
  - Bank with demand deposits can make everyone better off
- But… coordination problem among late consumers
  - Staying is better if everyone stays (A > B)
  - Running is better if everyone runs (D > C)
  - Multiple equilibria, “good” and “bad”

		Bank: Solvent	Bank: Insolvent
Consumer	Stay	**A**	C
	Run	B	**D**

Solvency and Liquidity

Solvency and Liquidity

- Eisenbach, Keister, McAndrews, Yorulmazer (2014)
  - Solvency and liquidity cannot be viewed separately

- Financial intermediary balance sheet:

Assets	Liabilities
m: cash, safe & liquid	s: short-term debt
y: asset, risky & illiquid	ℓ: long-term debt
	e: equity

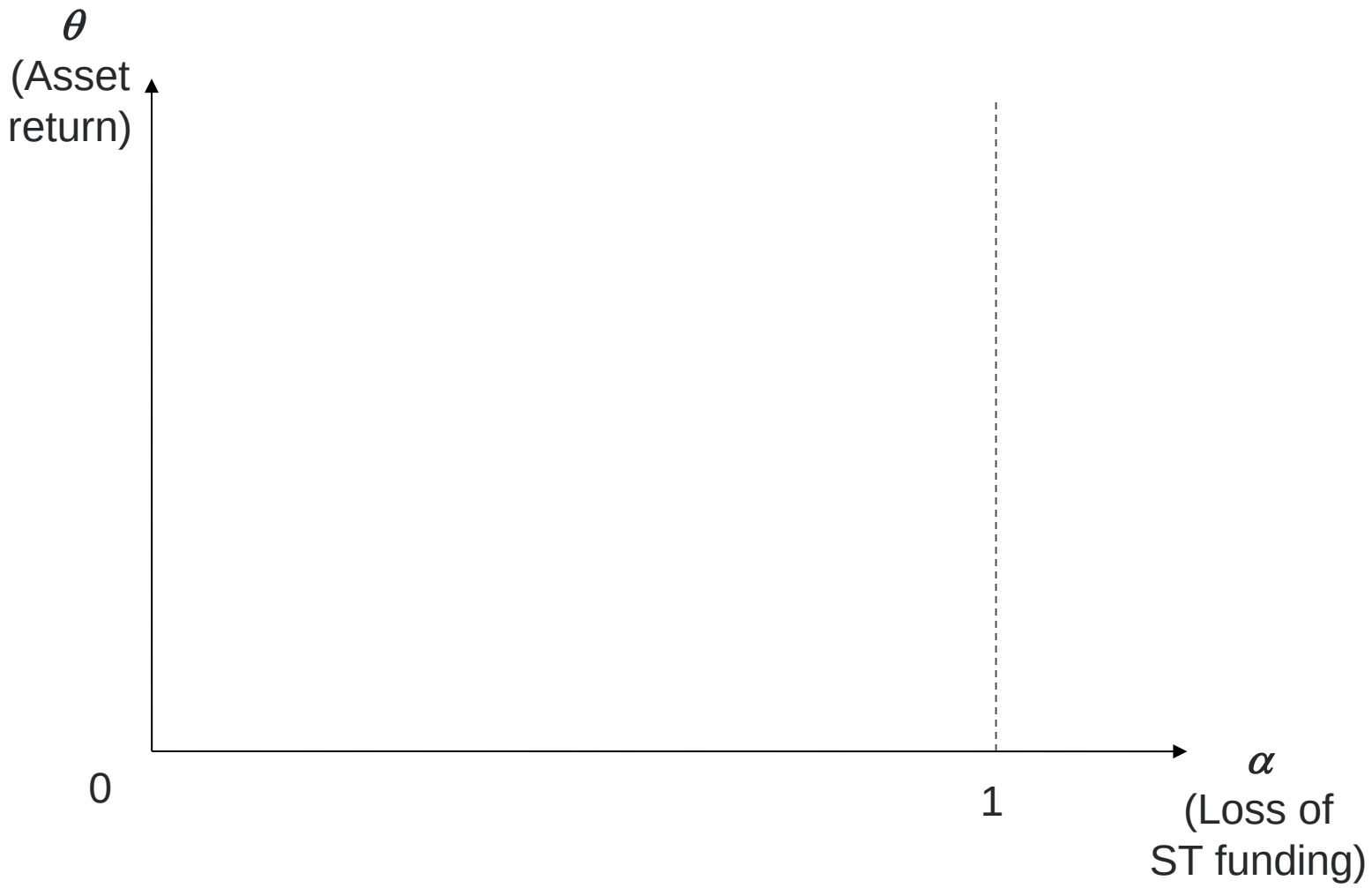
Solvency and Liquidity

Assets	Liabilities
m: cash, safe & liquid y: asset, risky & illiquid	s: short-term debt ℓ: long-term debt e: equity

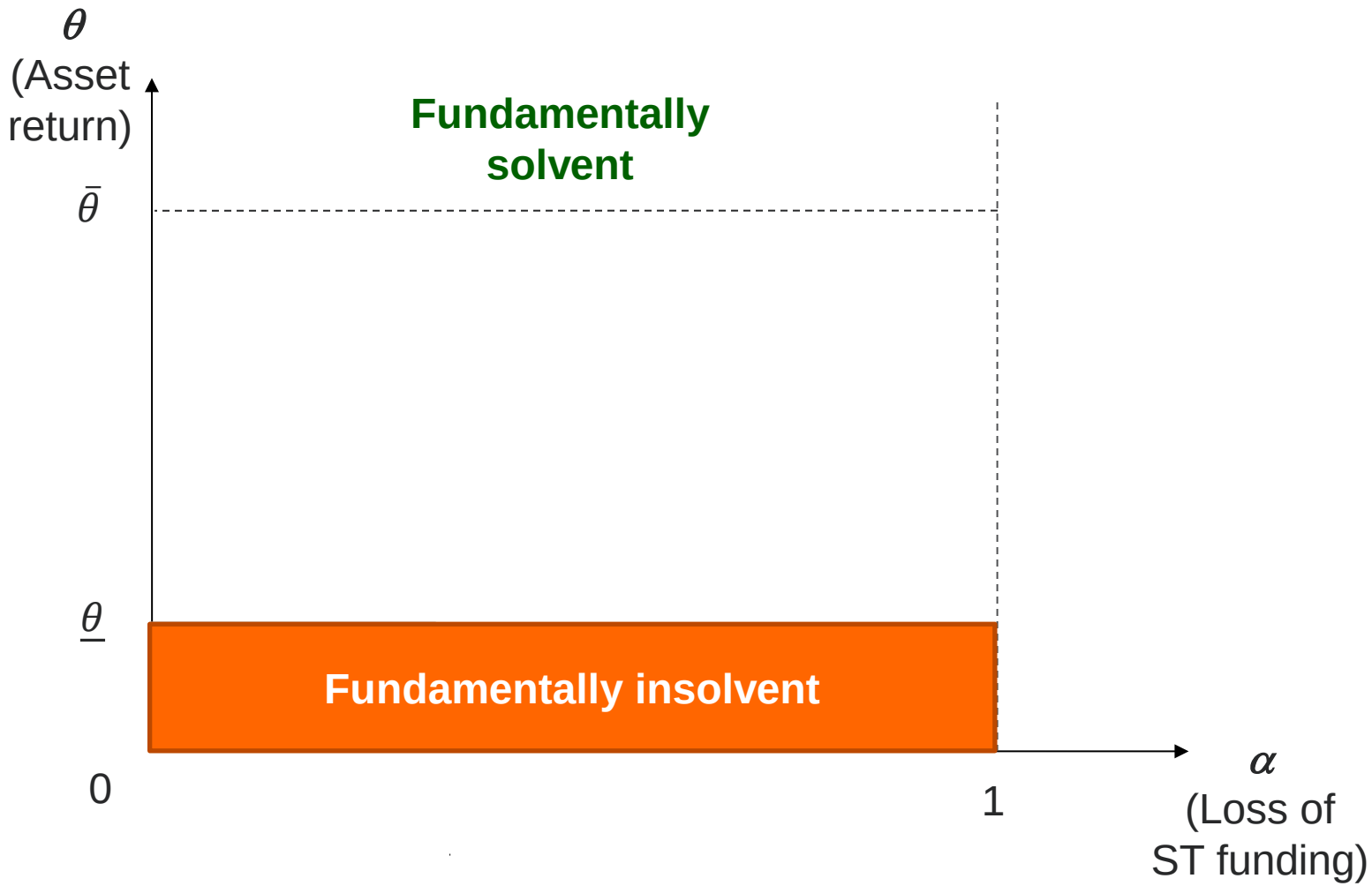
- Asset y:
  - Fundamental value θy if held until maturity
  - Liquidation value $\tau\theta y$ with $\tau < 1$ if liquidated early
- Short-term debt s:
  - Promises r_s if rolled over, 1 if withdrawn early
  - Fraction α is withdrawn

- Both θ and α are uncertain
  → shocks to assets **and** liabilities

Solvency and Liquidity



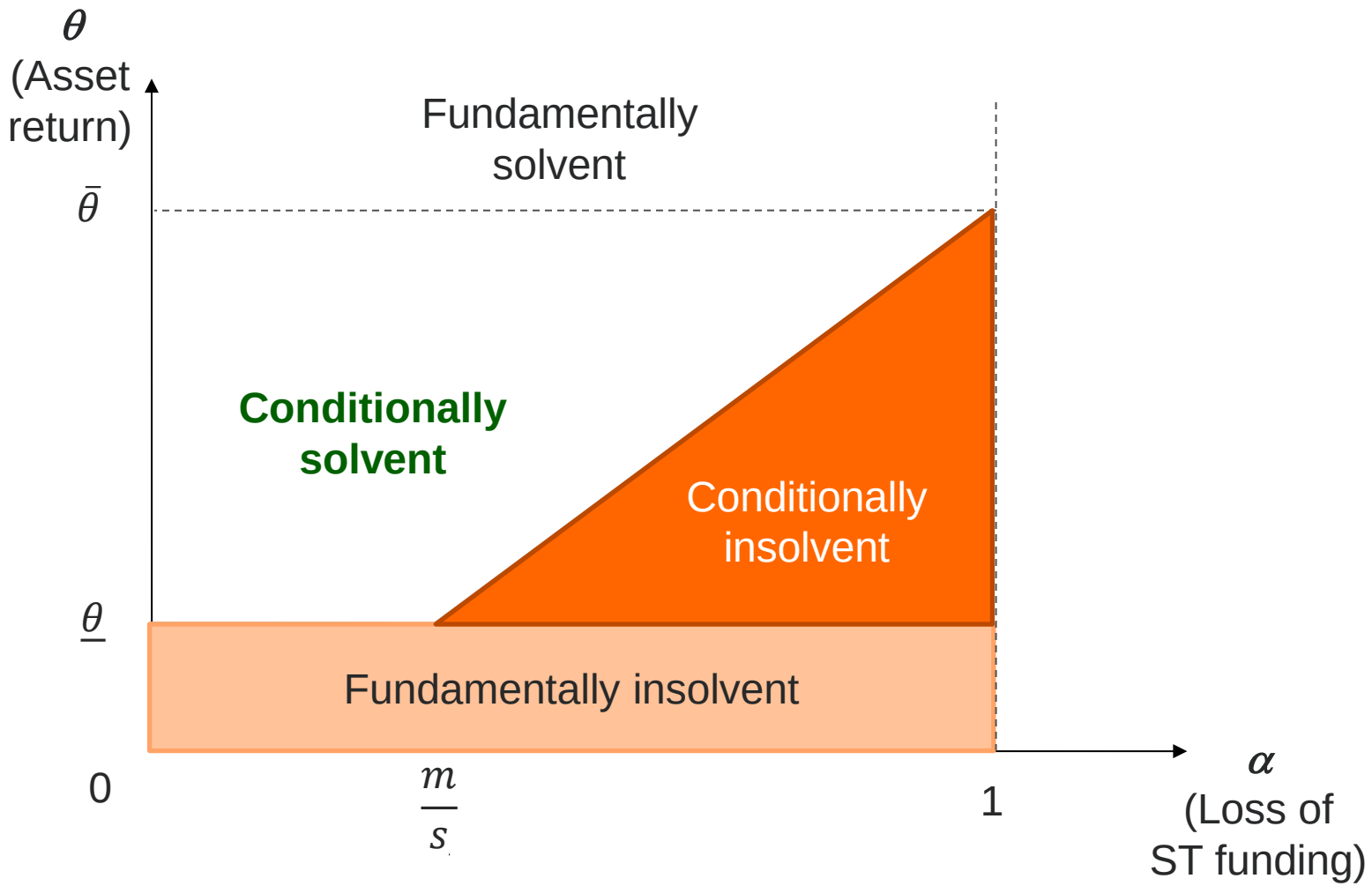
Fundamental Solvency



- For asset return sufficiently high / low
  - Debt can / cannot be repaid **irrespective of** withdrawals

→ Intermediary is “fundamentally solvent / insolvent”

Conditional Solvency



- For intermediate asset returns
  - Solvency **depends on** level of withdrawals

→ Intermediary is “conditionally solvent / insolvent”

Pro-cyclical Leverage

Pro-cyclical Leverage

- Adrian and Shin (2010)

Assets	Liabilities
A: asset value	D: debt E: equity

Leverage:

$$L = \frac{A}{E} = \frac{A}{A - D}$$

- Change in leverage after change in asset value?
  - Debt is a fixed claim
  - Equity bears losses

→ Expect **counter-cyclical** leverage:

$$A \uparrow \Rightarrow L \downarrow \quad \text{and} \quad A \downarrow \Rightarrow L \uparrow$$

NOTE: Assumes no active adjustments (issue/repay debt)

Pro-cyclical Leverage

- Household leverage as expected:

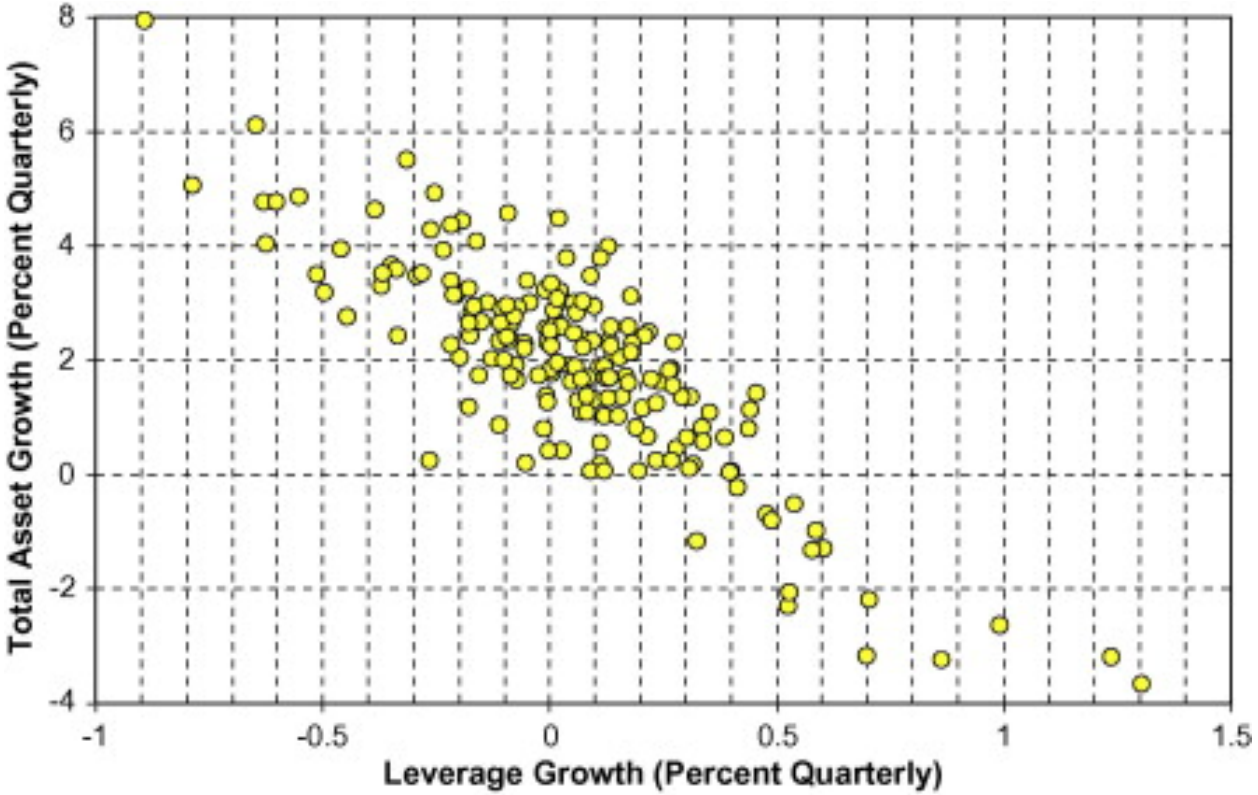


Figure 1 in Adrian and Shin (2010)

Pro-cyclical Leverage

- Commercial banks **target fixed** leverage:

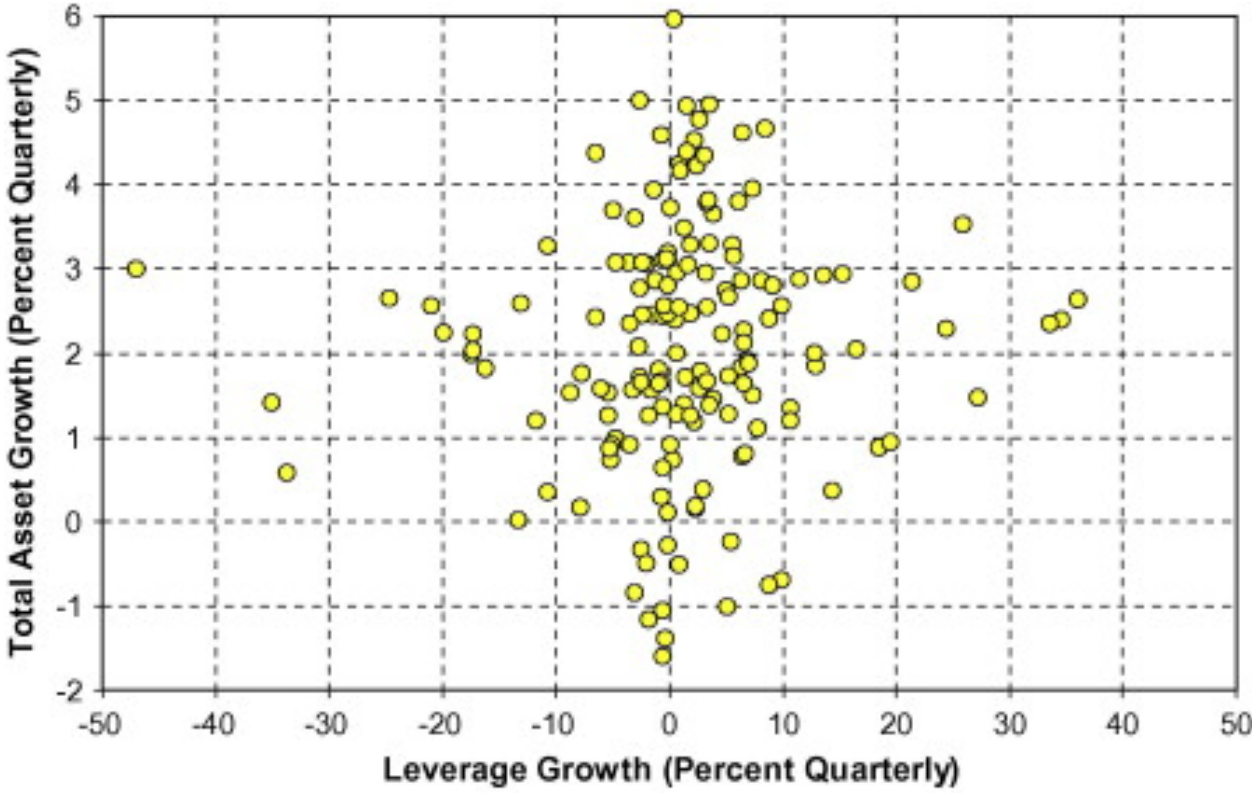


Figure 3 in Adrian and Shin (2010)

Pro-cyclical Leverage

- Broker dealers **disproportionally adjust** leverage:

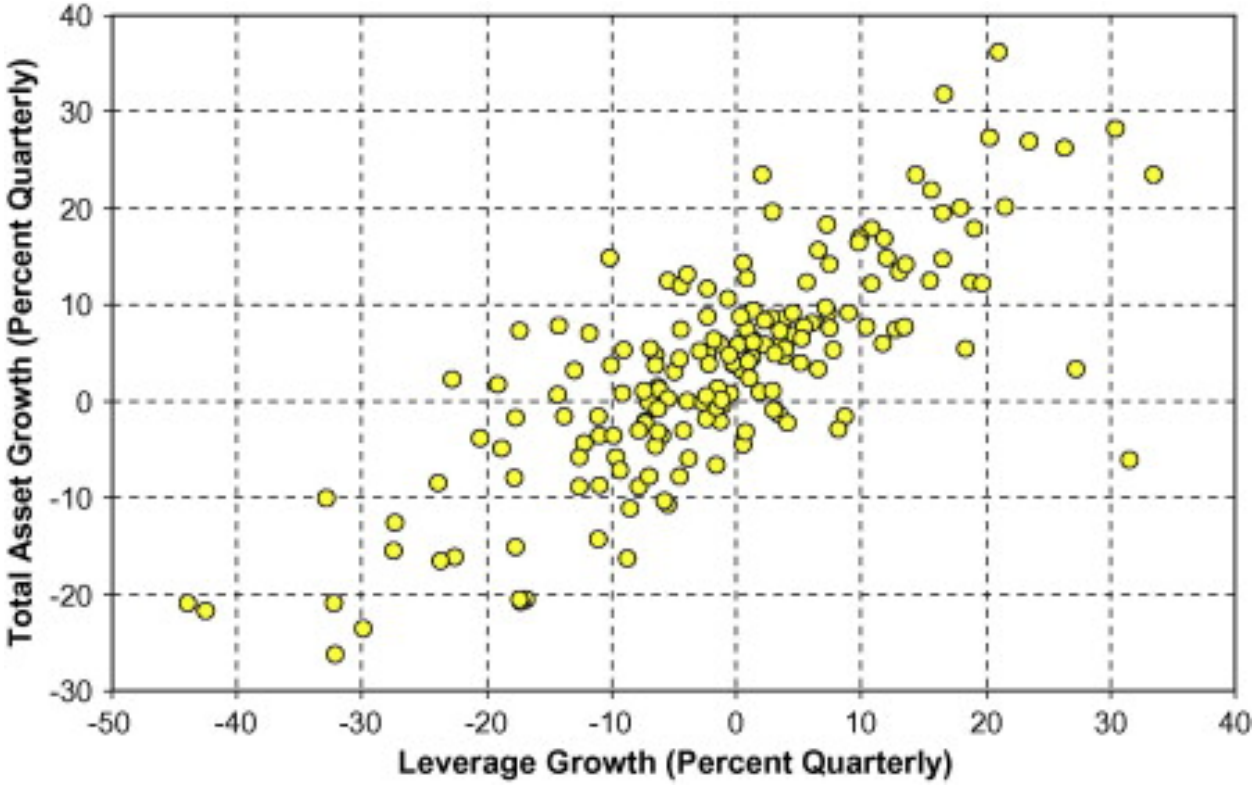


Figure 4 in Adrian and Shin (2010)

Pro-cyclical Leverage

How does leverage targeting work?

Assets	Liabilities
100	80 debt 20 equity

Leverage: 5

Shock to asset value →

Assets	Liabilities
90	80 debt 10 equity

Leverage: 9

- Leverage targeting implies
  - Sell when asset prices fall
  - Buy when asset prices rise
- Potential to **amplify volatility**, especially during times of stress
- Effects stronger for pro-cyclical target than for constant target

↓ **Sell 40 of assets**

Assets	Liabilities
50	40 debt 10 equity

Leverage: 5

Monitoring and Policies

Federal Reserve and Financial Stability

- Monetary policy
- Banking regulation & supervision

- Financial stability matters for monetary policy
  - Financial conditions affect transmission of monetary policy
  - Monetary policy affects financial risk taking
  - Financial vulnerabilities are down-side risk to real economy
- Set of tools for financial stability
  - Monetary policy itself – blunt and with unintended effects
  - Micro-prudential – stability of individual institutions
  - Macro-prudential – stability of financial system

Monitoring, Spillovers, Institutions

- Systemic risks can emerge during benign periods
  - Systemic risk built up during the period of low volatility
  - Accounting and risk measurement problems can obscure risks
- Externalities have first order, aggregate effects
  - Fire sales and effects on the real economy
  - Interconnections transmit distress
- Shadow banking system affects core financial institutions
  - Regulatory arbitrage / financial innovation
  - Implicit and explicit guarantees from core to shadow institutions

Macroprudential Considerations by Sectors

1. Asset markets
   - The risk of abrupt reversals in asset values tends to increase when the pricing of risk is compressed
2. Banking sector
   - Firms are considered systemically important because their distress or failure could disrupt the functioning of the broader financial system and inflict harm on the real economy
3. Shadow Banking sector
   - Shadow banks provide maturity and liquidity transformation without public sources of backstops and represent systemic risks due to their connections to other financial institutions
4. Non-financial sector
   - Linkage of financial sector to real economy is via the provision of credit

Asset Markets

- Vulnerabilities
  - Overvaluations and leverage
  - Low volatility and compressed risk premiums
- Macroprudential policies
  - Sectoral risk weights for banks
  - Margin and haircut requirements

- Cleaning up ex post can lead to excessive risk taking
  - Collective moral hazard due to “Greenspan put”
  - Ex ante macroprudential policy preferable
- Forward guidance can contribute to low volatility
  - Asset prices can be fueled by the combination of low rates and low volatility, exacerbating the leverage cycle

Banking Sector

- Vulnerabilities
  - Pro-cyclical leverage of banks and broker-dealers
  - Risk-taking channel of monetary policy
- Macroprudential policies
  - Countercyclical capital and risk weights
  - Sectoral risk weights, exposure limits
  - Supervisory guidance
  - Stress tests for capital (CCAR) and liquidity (CLAR)

- Measures of systemic importance
  - Size, interconnectedness, complexity, and critical services
  - Market-based measures of systemic risk (CoVaR, SES,…)

Shadow Banking Sector

- Vulnerabilities:
  - Pro-cyclical intermediated leverage (dealer → hedge fund)
  - Excessive maturity transformation
  - Regulatory arbitrage
- Macroprudential policies
  - Monitor and reduce incentives for regulatory arbitrage
  - Minimum haircuts or margins
  - Tighter standards on securitization

- Activities not backed by government backstops:
  - MMFs, cash pools, securities lending / repo activities, velocity of collateral, securitization

Non-financial Sector

- Vulnerabilities:
  - Deterioration in lending standards
  - Excess household leverage
- Macroprudential policies:
  - Loan-to-value and debt-to-income ratios
  - Limits on adjustable rate loans for borrowers

- Other non-financial sector risk
  - Leverage of businesses, governments
  - Non-financial credit ultimately funded with short-term debt

Questions?