Monetary Policy Implementation

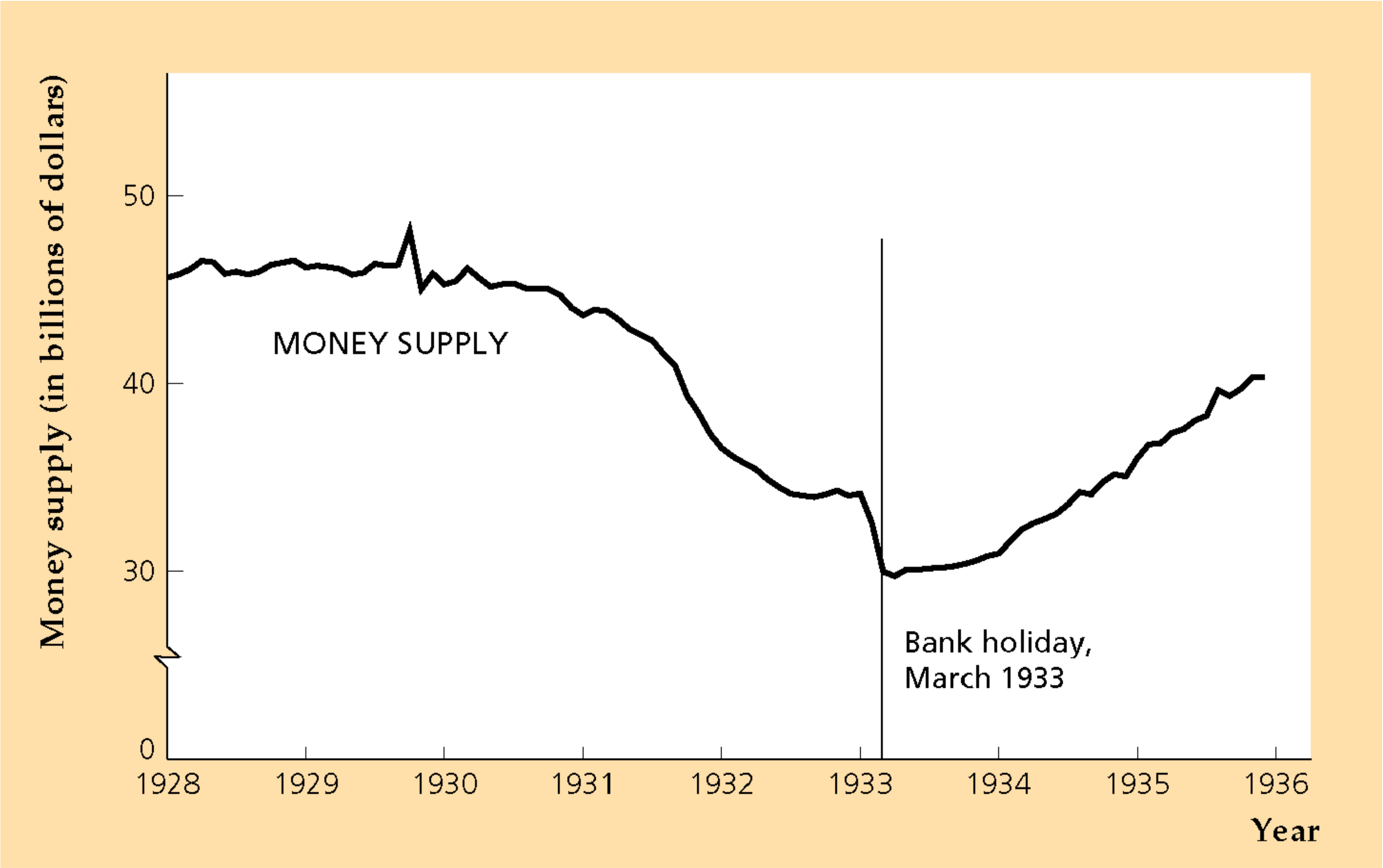
What is Money?
It Has Three Functions

- Unit of account
- Medium of exchange (transactions, credit)
- Store of value

Today

- Unit of account
- Medium of exchange (transactions, credit)
- Store of value

Money supply in the Great Depression



(b) The money supply in the Great Depression

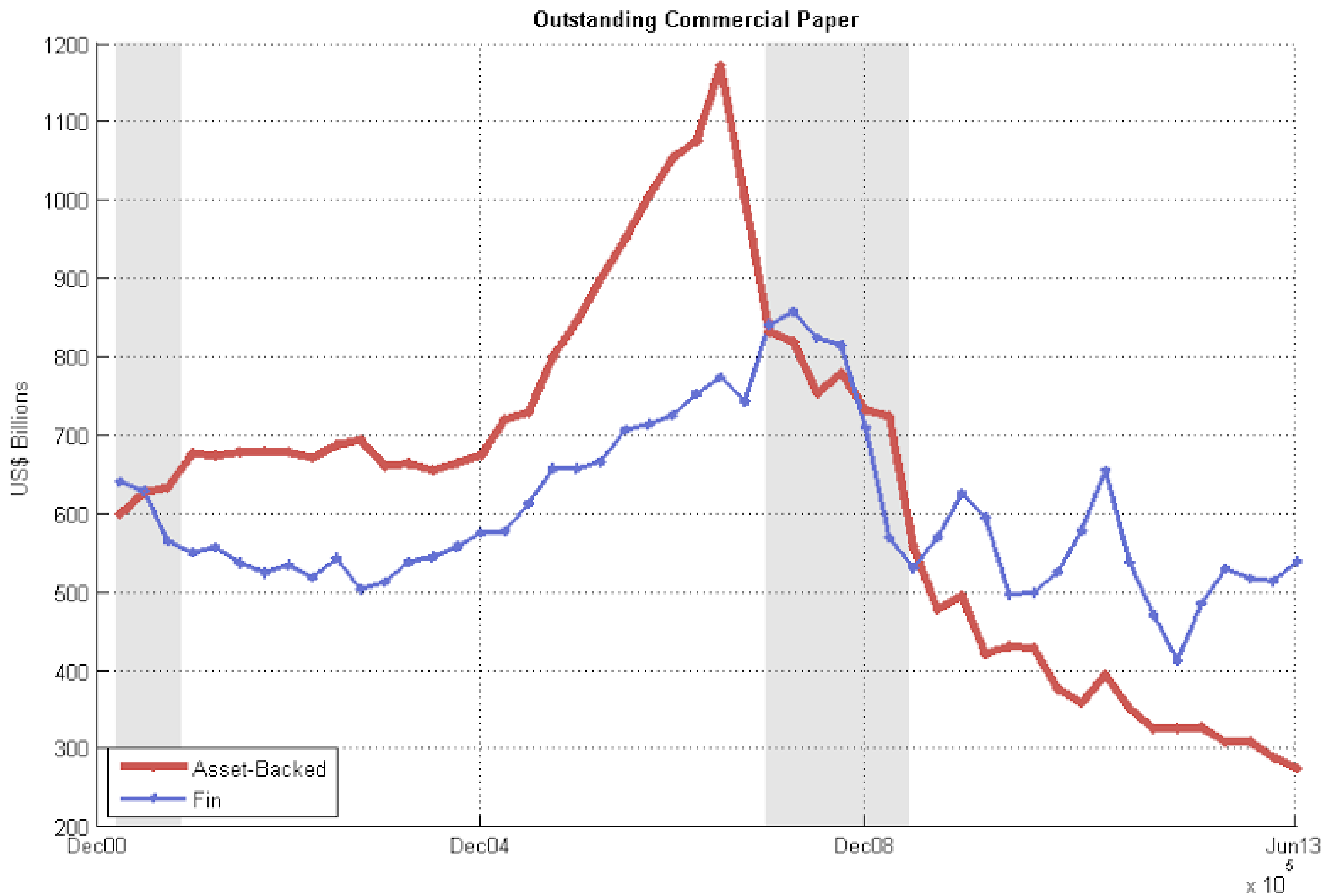
Contraction in Money Supply

- Friedman Schwartz:
  - Problem because credit unavailable
  - Less exchange
- History of Great Depression
  - Banks runs induced people to hold on to money
  - Fed worsened things
    - Contracted Money Supply

Recent Recession

- Collapse of Many Asset Markets
- Similar Story
  - I will explain why
- Solution?

Asset Backed and Financial Commercial Paper



If reduction in Money was Problem, can anyone suggest a Solution?

Solution: Print More Coupons

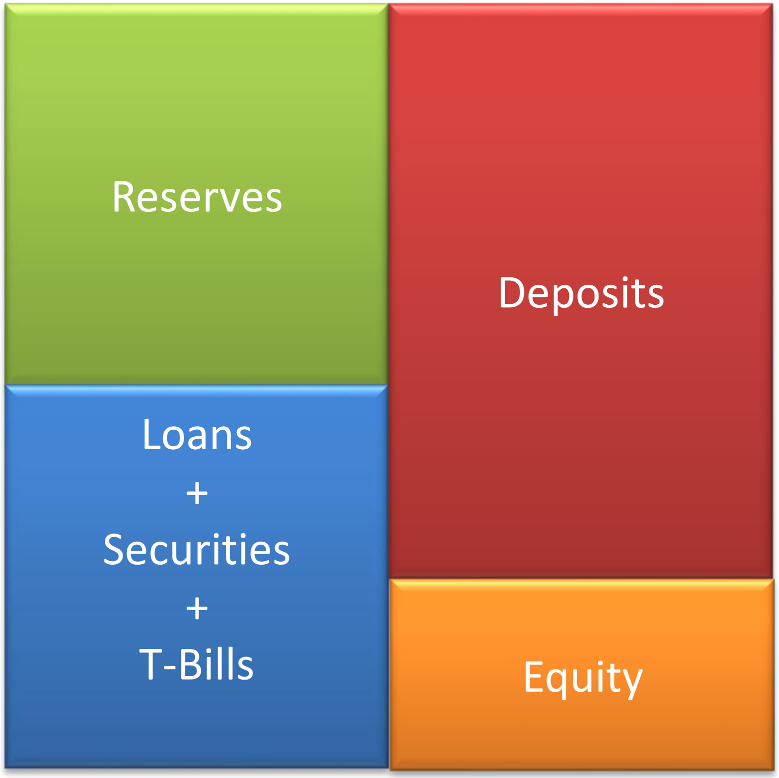
Caveat…

- Thing aren’t as simple…
- Institutional details matter
- There’s no such things as a helicopter drop

Money Creation
by Banks
(Money Multiplier)

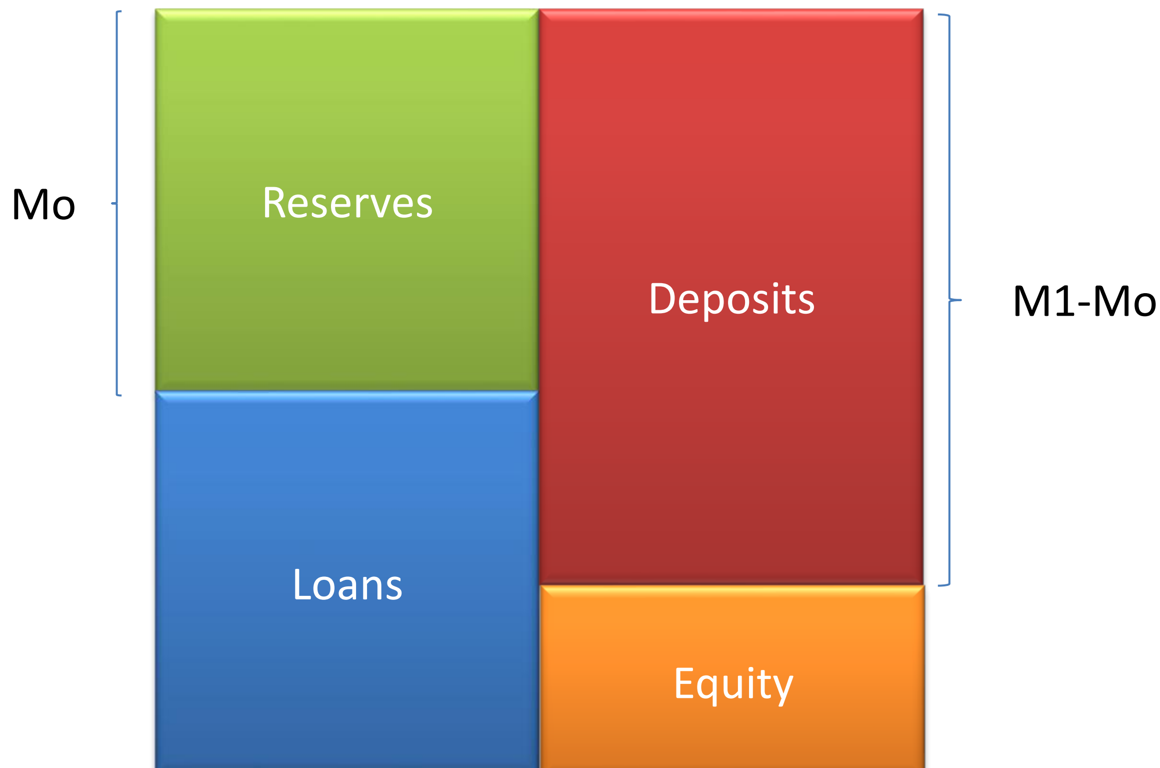
Money Creation
Bank’s Balance Sheet

A Bank's Balance Sheet

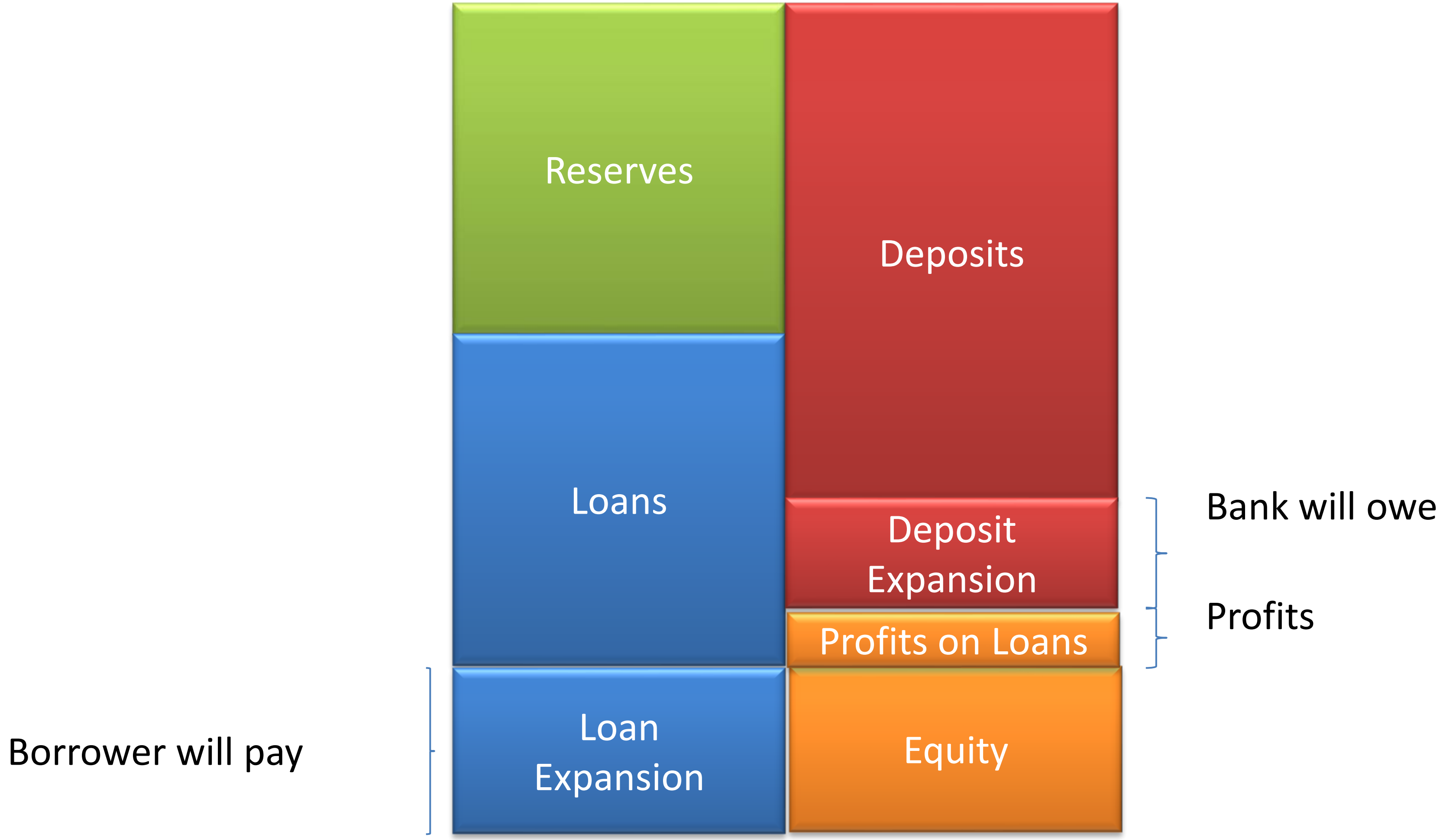


A Bank's Balance Sheet

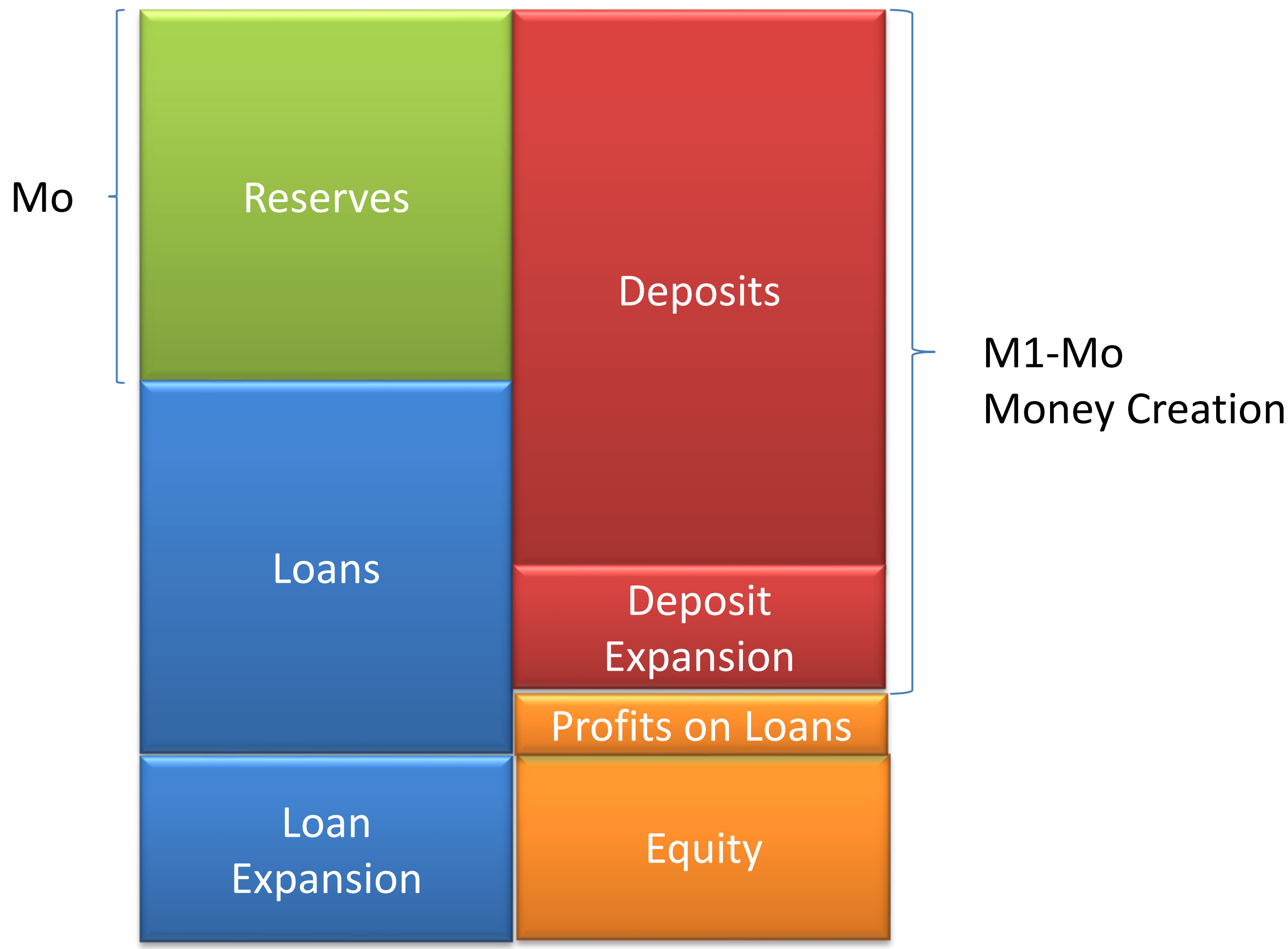
Ratio: M1/M0 is called money multiplier



More Loans


Reserves
Deposits
Loans
Deposit Expansion
Bank will owe
Profits on Loans
Profits
Loan Expansion
Equity
Borrower will pay

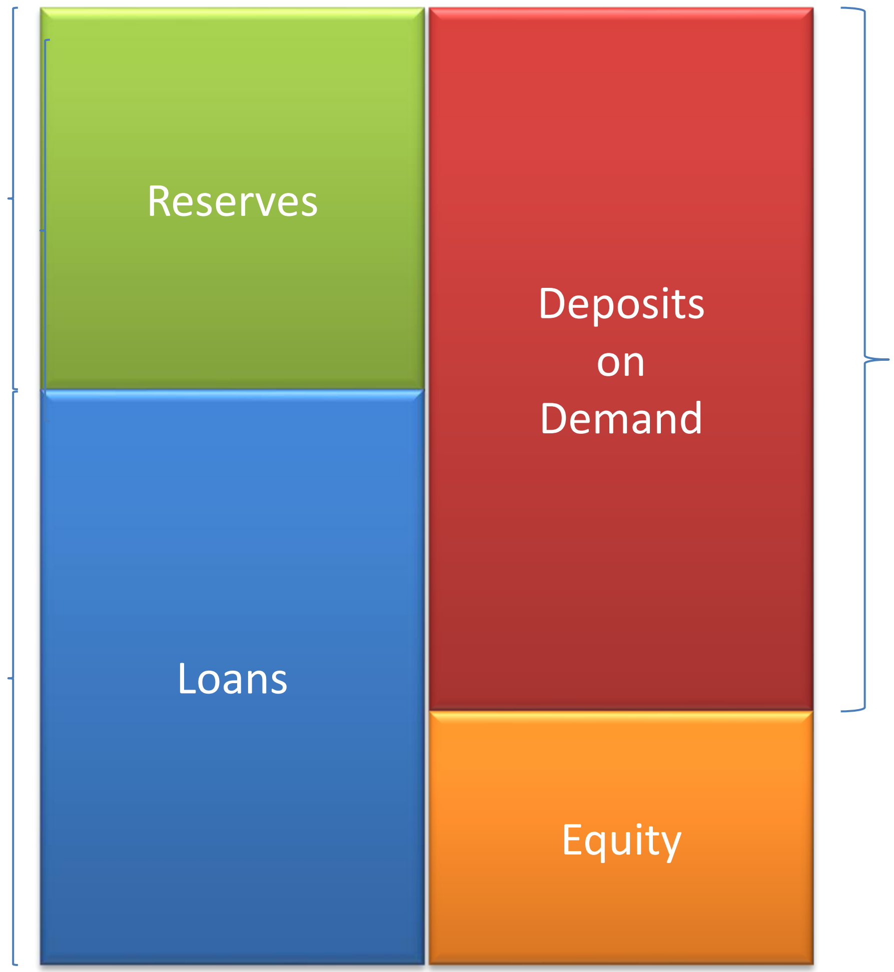
It affects Money Aggregates



Bank's Balance Sheet

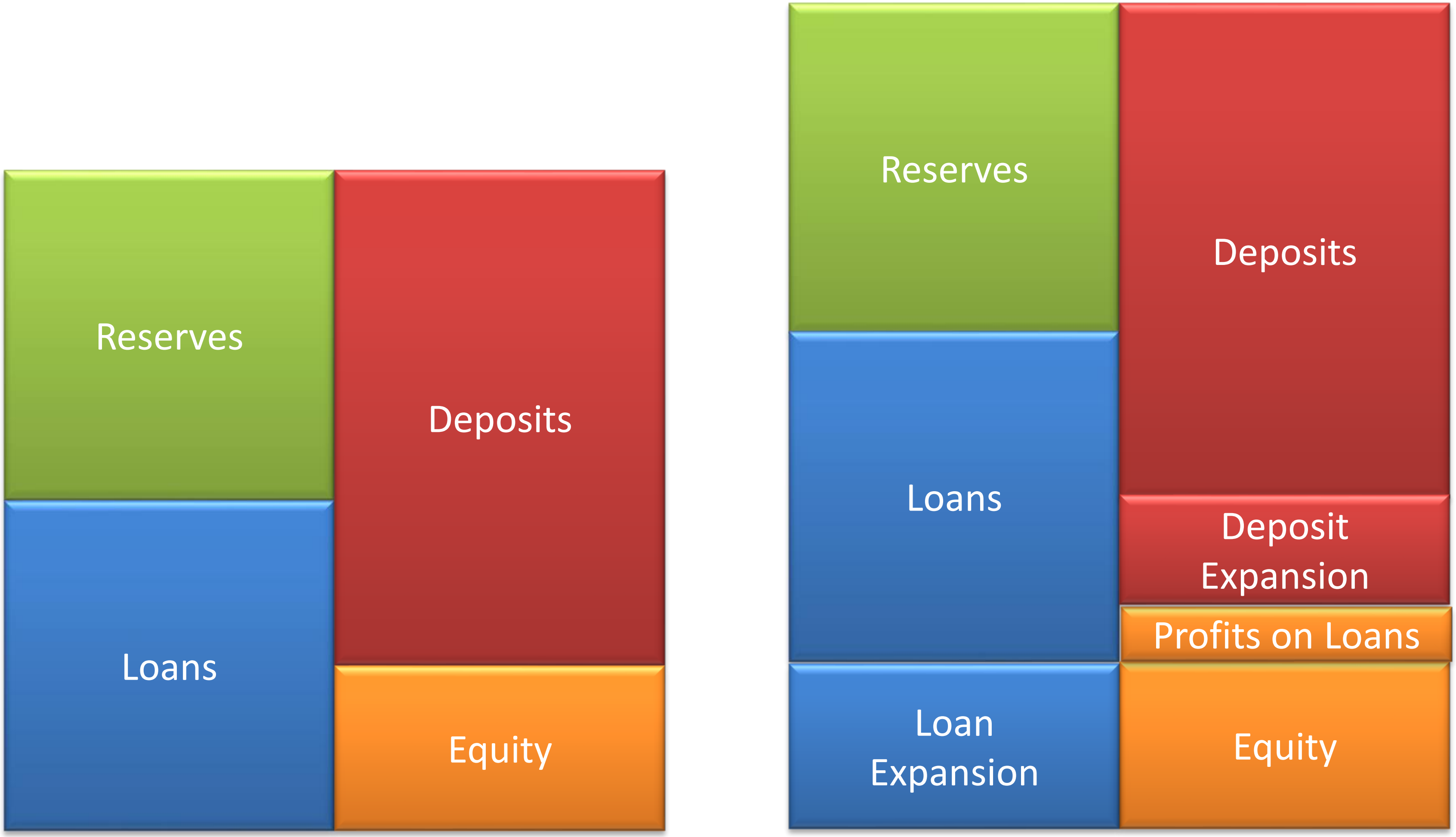
Liquid Assets
Regulated Reserves

Illiquid Assets
- Expertise
- Adverse-Selection
- Maturity



Medium of Exchange
Store of Value

More Loans= More Profits

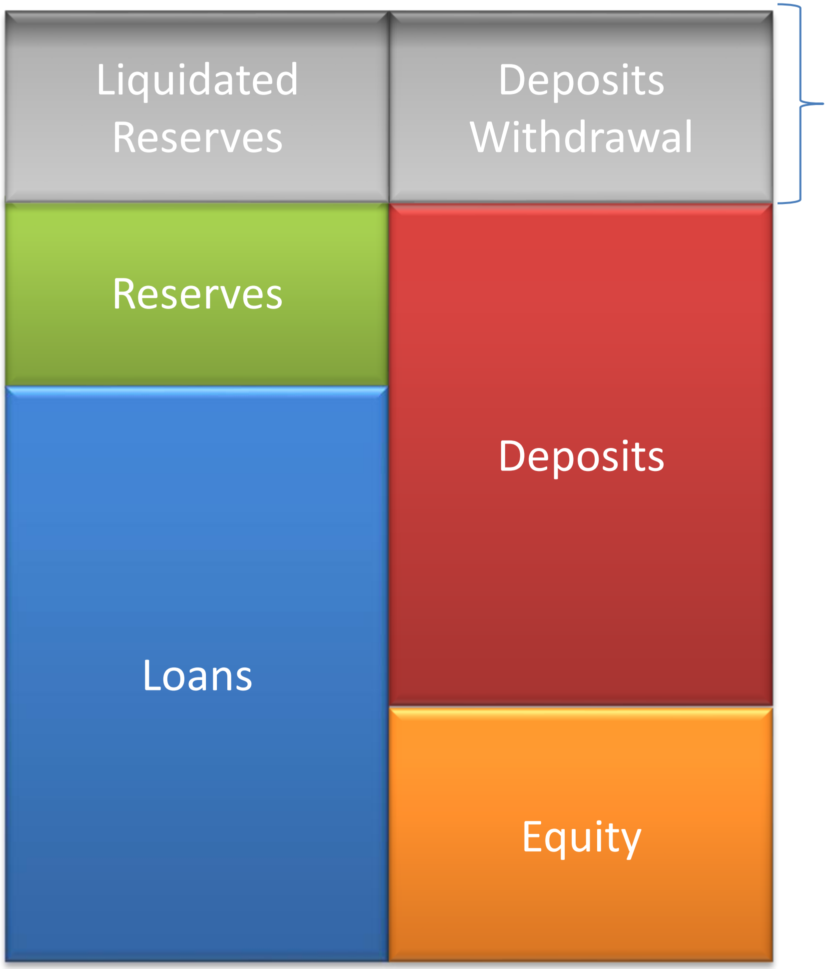


Takeaway

- Banks make loans issuing liabilities
  - Credit lines or deposits
- This process is Monetary Creation
- Given interest differential, they make profits on loans

Withdrawal

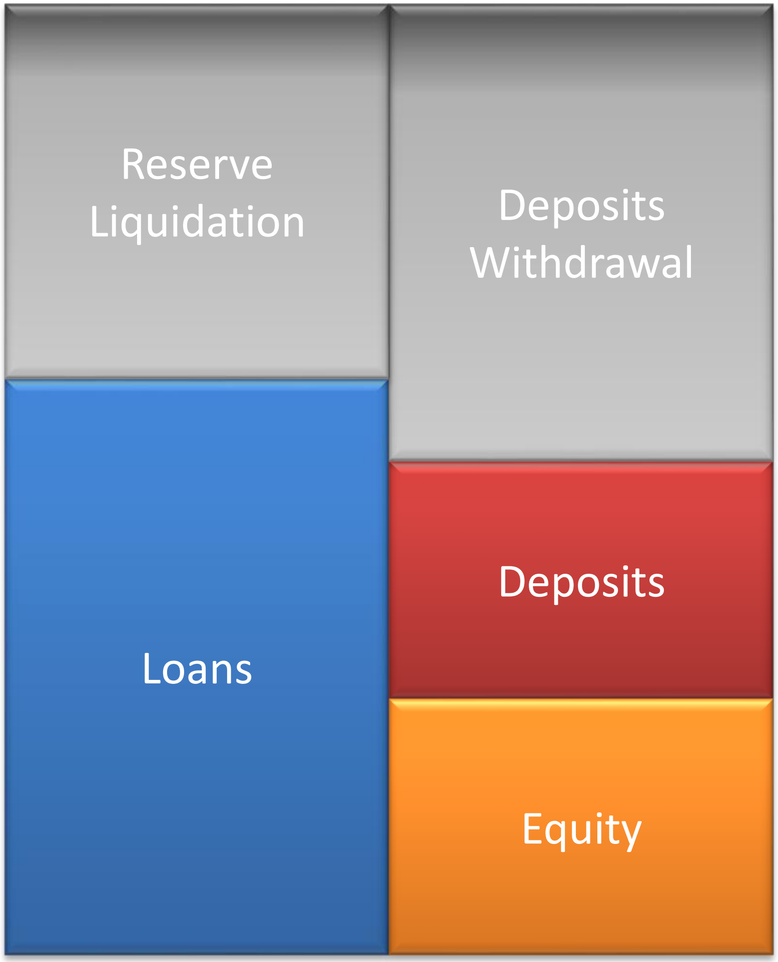
Deposits can Leave



Random Transfer to another Depositary Institutions

Liquidity Risk
(Withdrawal Risk)

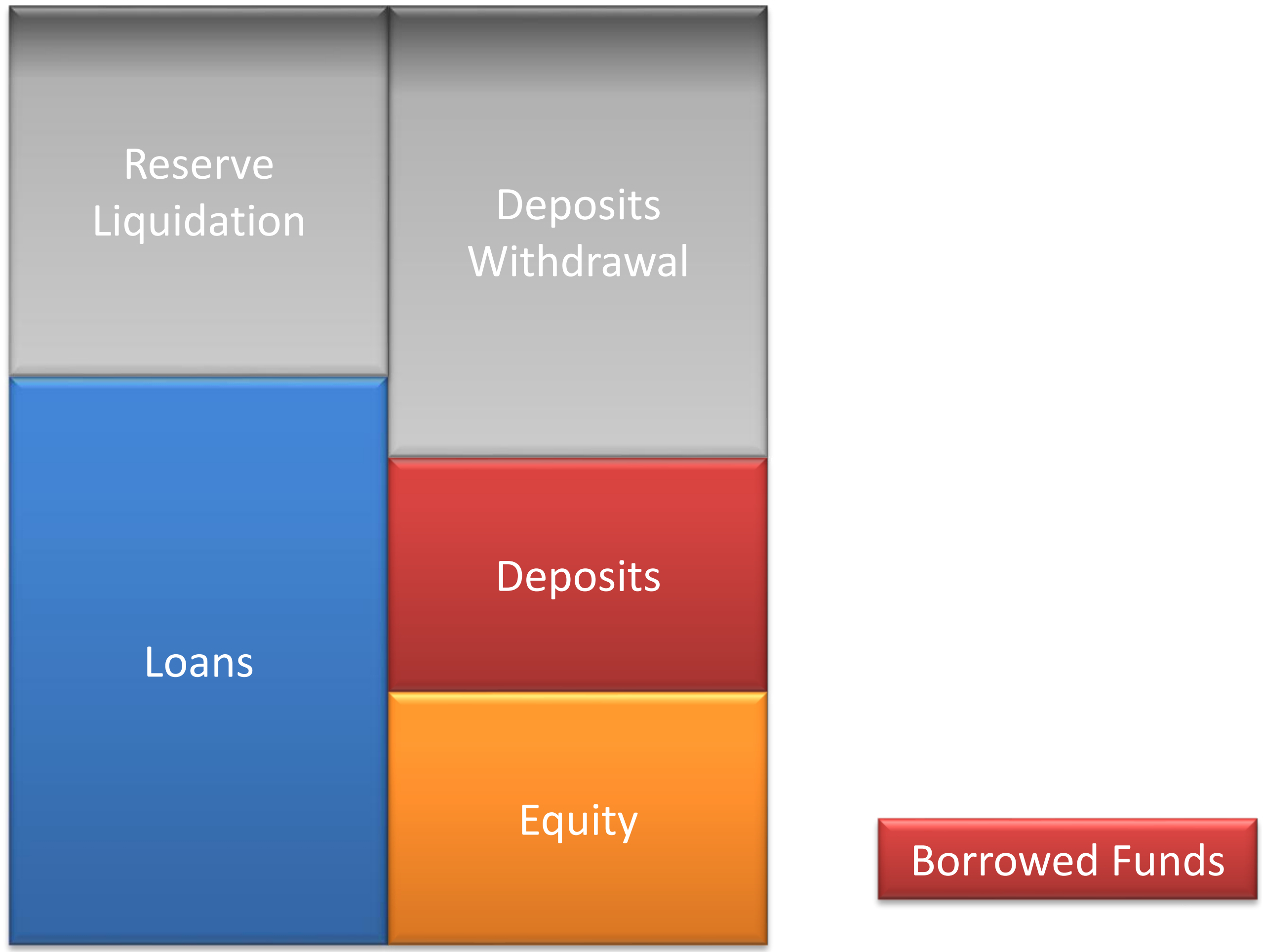
Deposits can Leave beyond Reserves



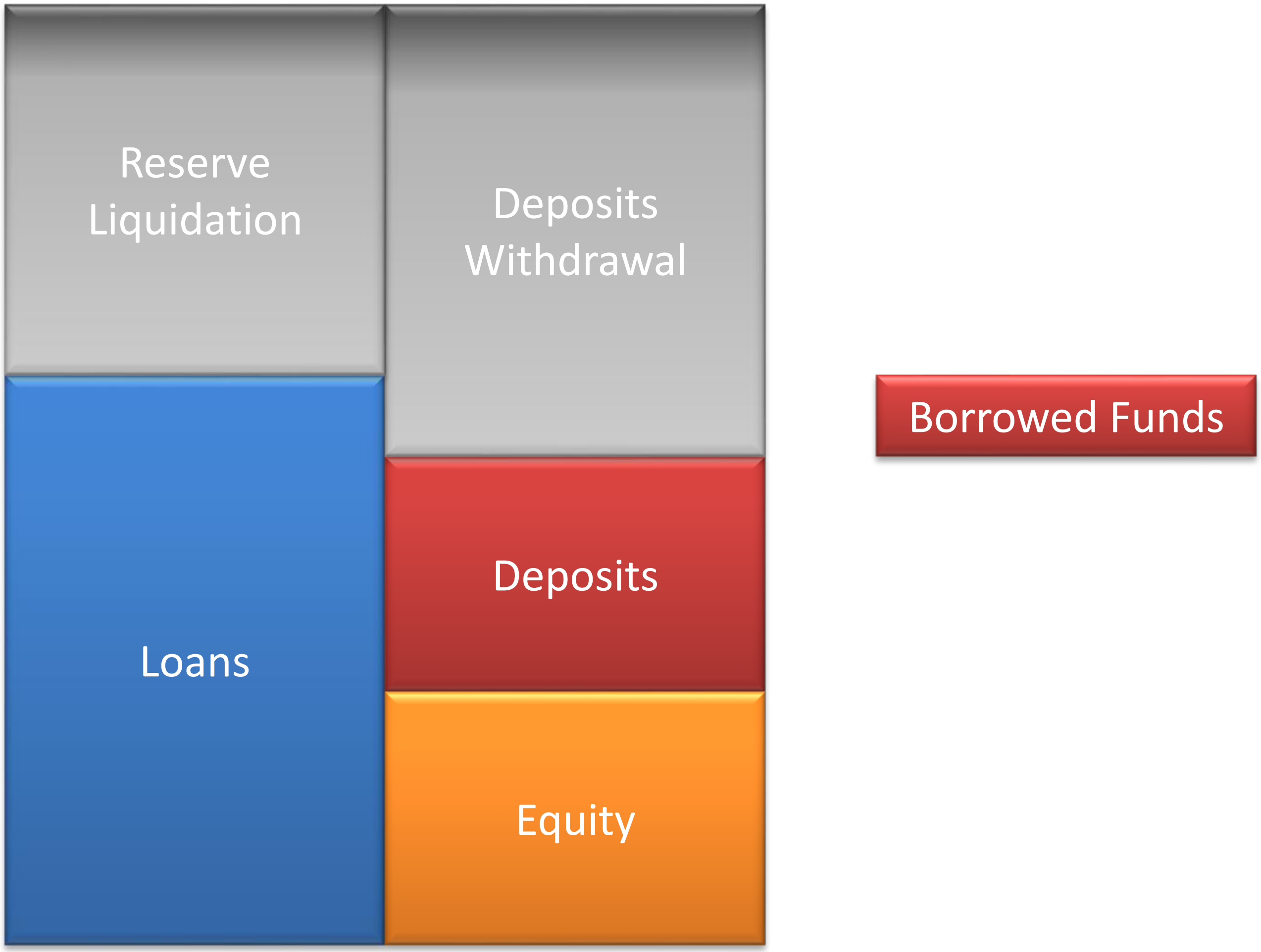
Withdrawal in excess of existing Reserves

Interbank Market

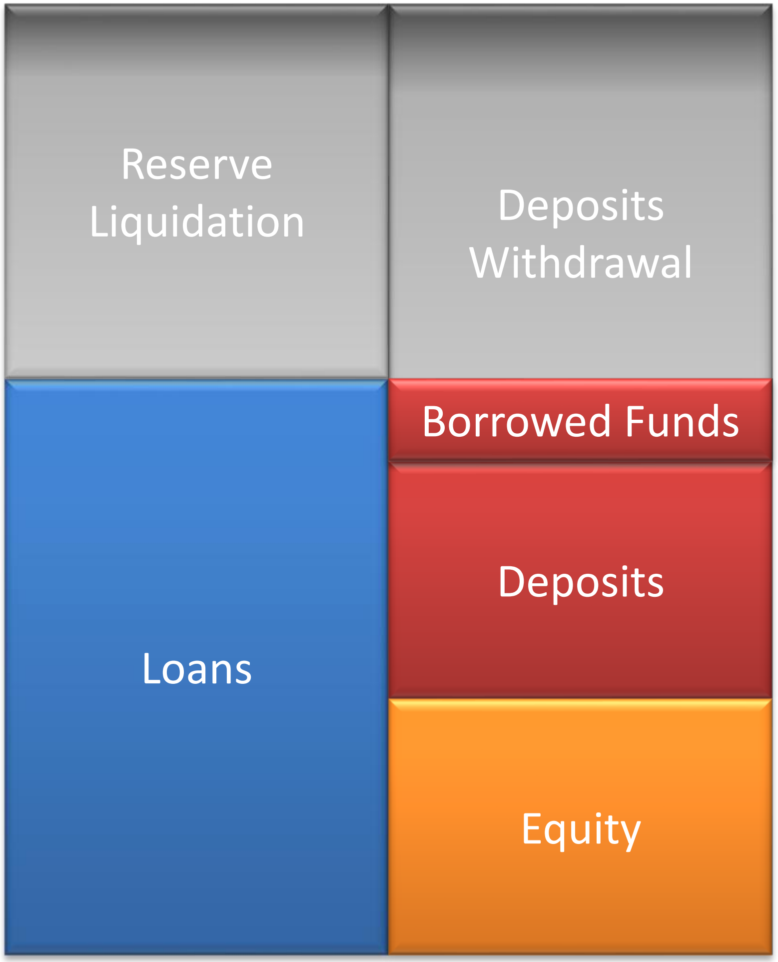
Patch deficit via Interbank Market



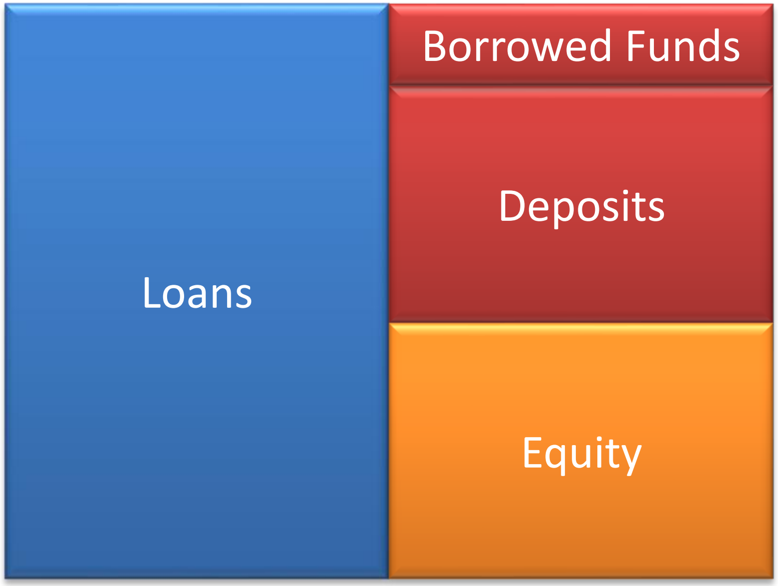
Patch deficit via Interbank Market



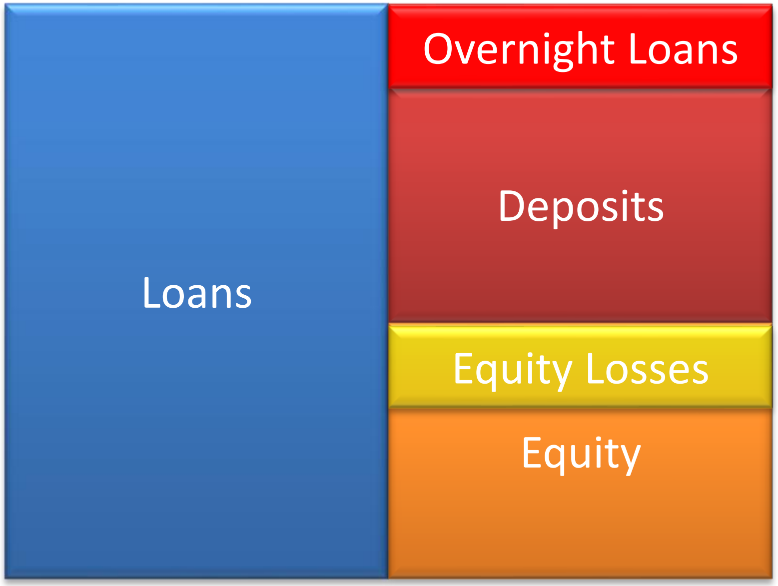
Patch deficit via Interbank Market



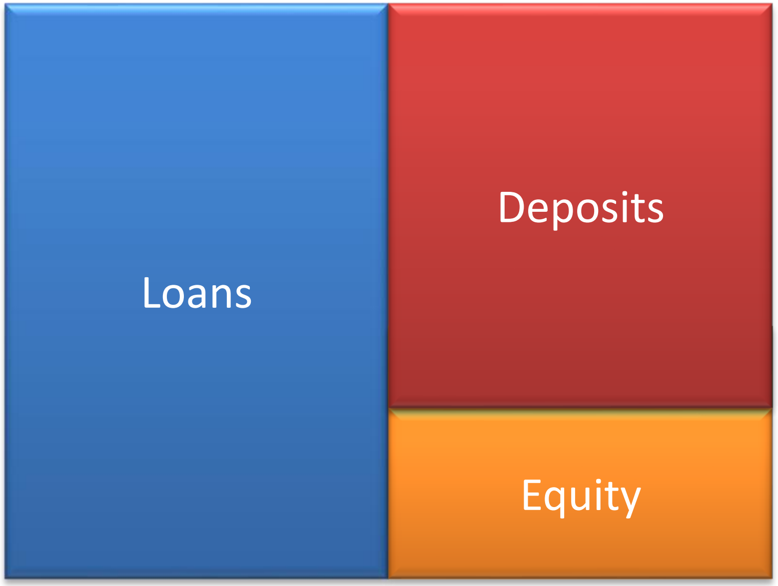
Patch deficit via Interbank Market



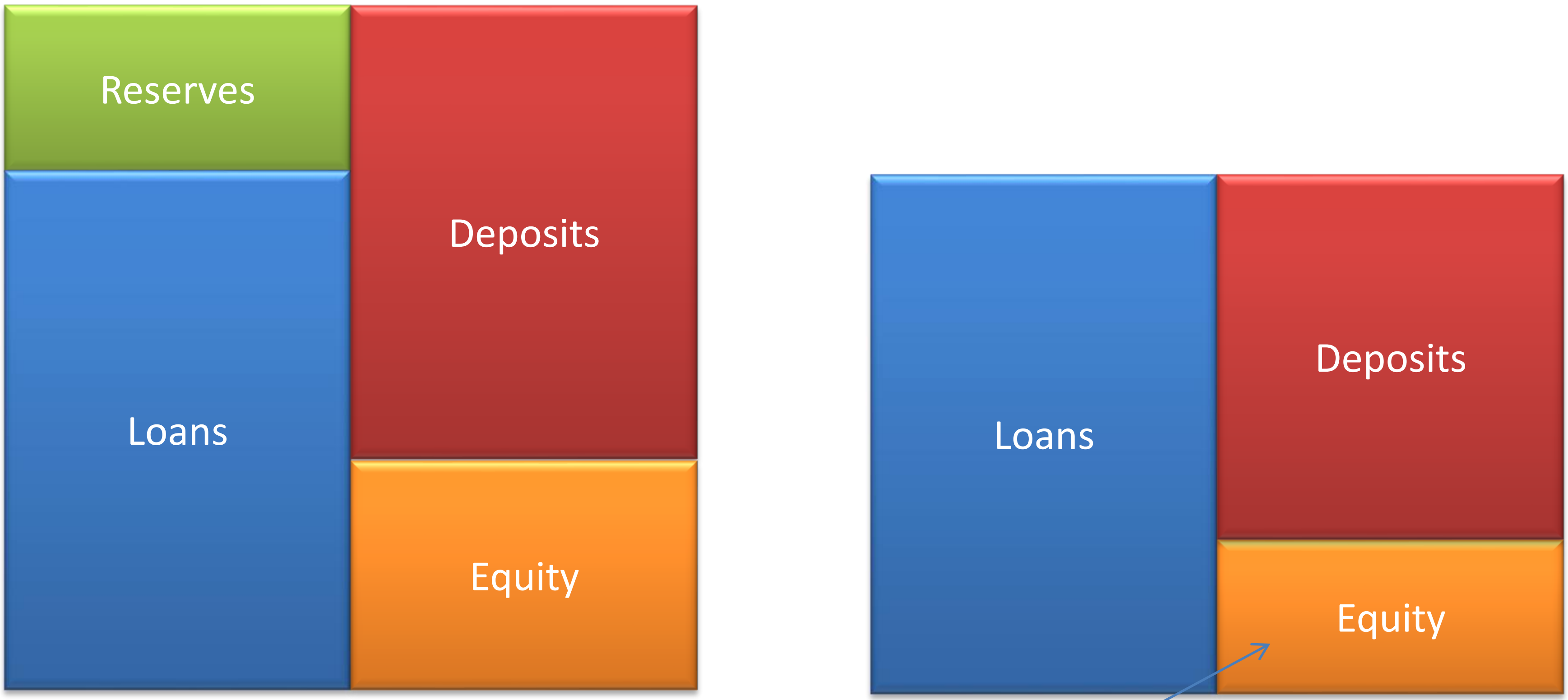
No Free Lunch though…



Borrowing means you have less Equity



More loans also means Liquidity Risk



Takeaway: Less equity than if bank would have made less loans…to much liquidity exposure

Banks Short of Reserves Borrow Every Day to Patch Reserve Deficit

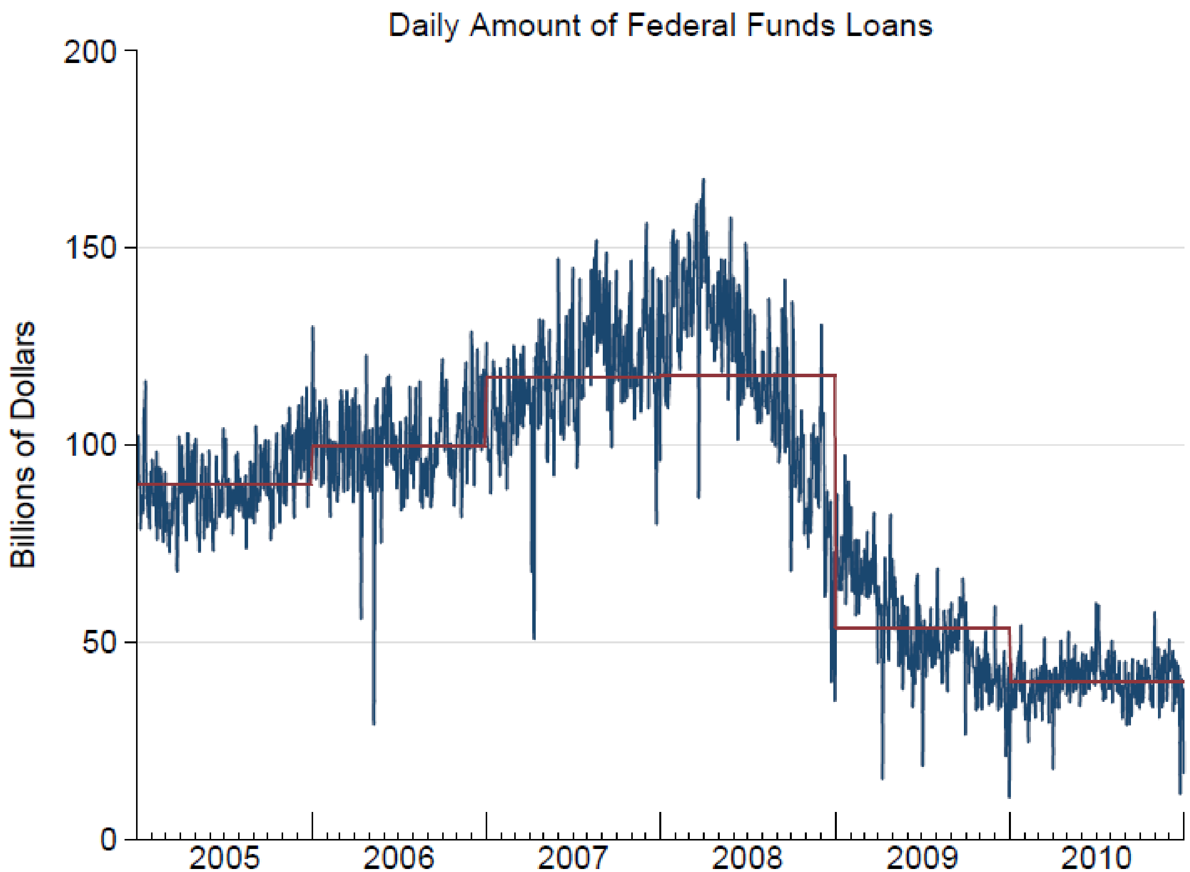
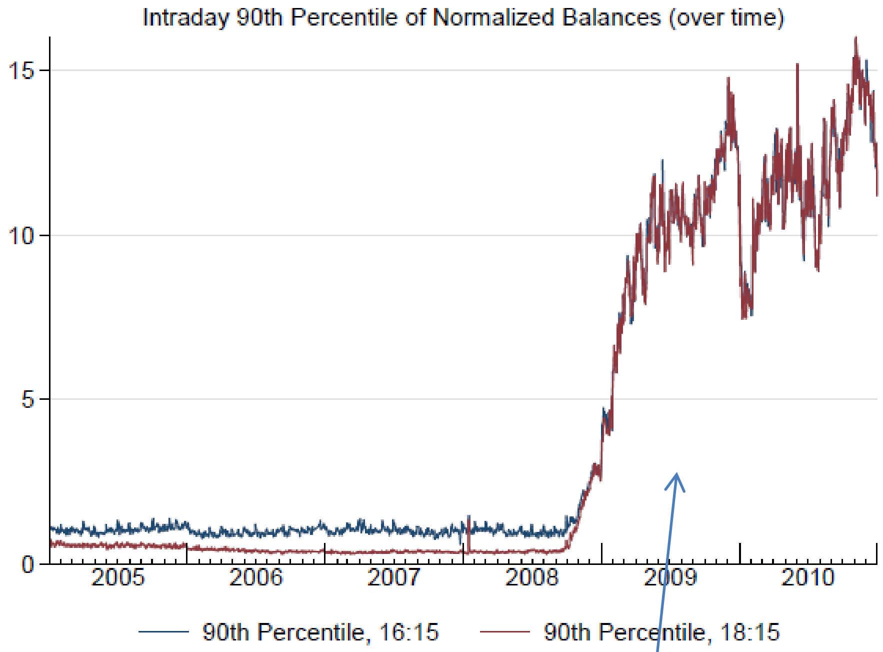
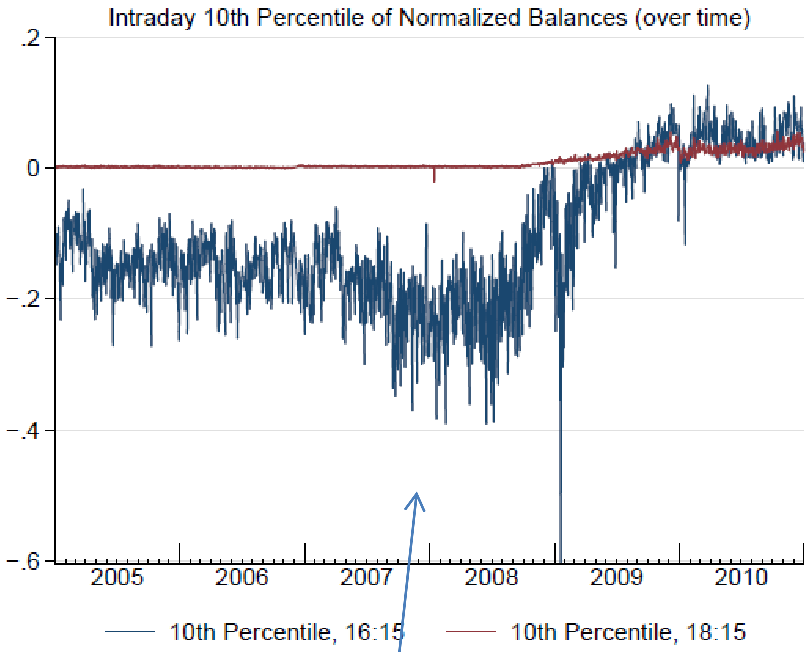


Figure 4: Daily trade volume

Banks Short of Reserves Borrow Every Day to Patch Reserve Deficit





lenders

borrowers

Takeaway

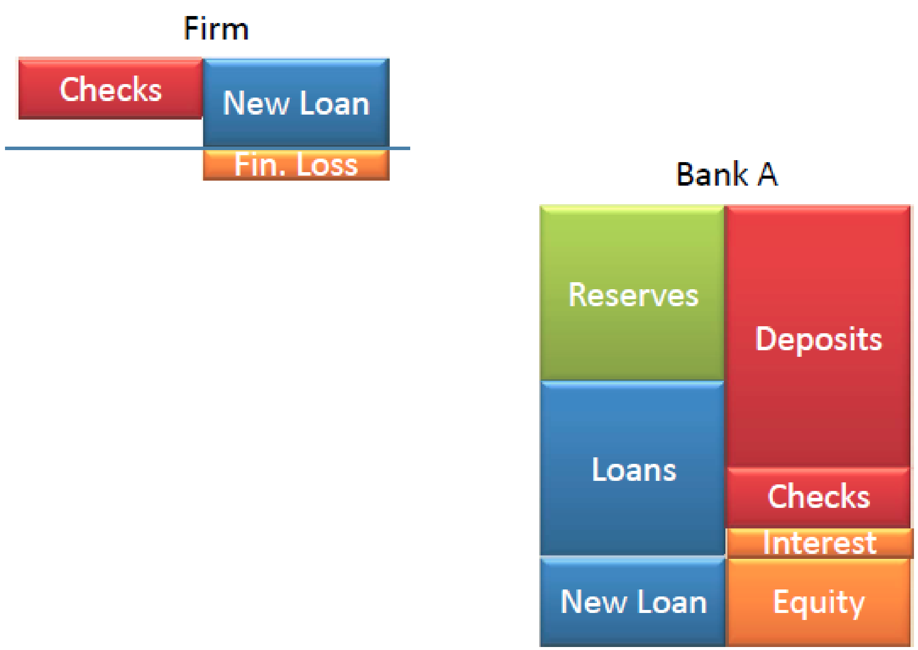
- Deposits are “callable-on-demand”
- They mover rapidly from one institution to another
- Banks use Central Bank Reserves
  - FedFunds to settle transactions
  - Banks short of reserves have to borrow them
  - More loans may lead banks to be more prone to greater withdrawal

Why does all this matter?

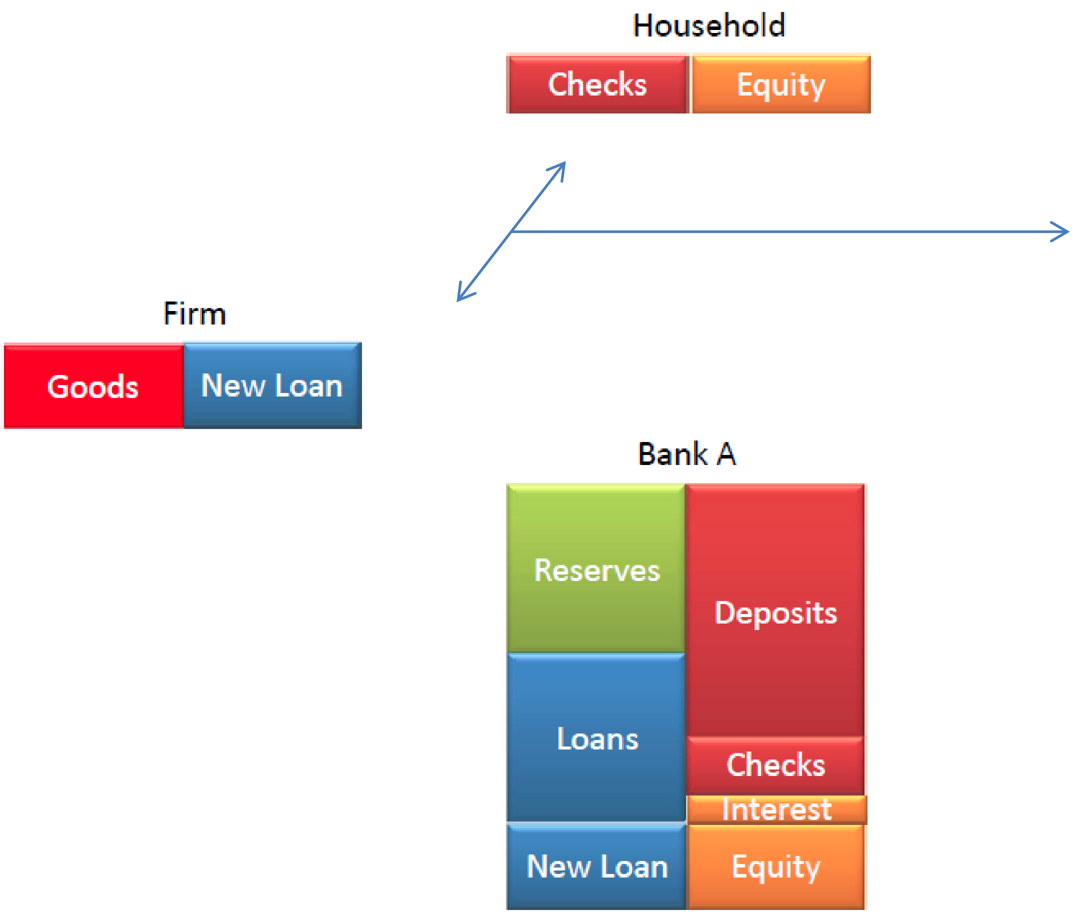
- Credit is fundamental for the workings of the economy
- Without credit, trade cannot occur!

Examples: Credit to Firms

Examples: Credit to Firm
Medium of Exchange on Hands of Firms

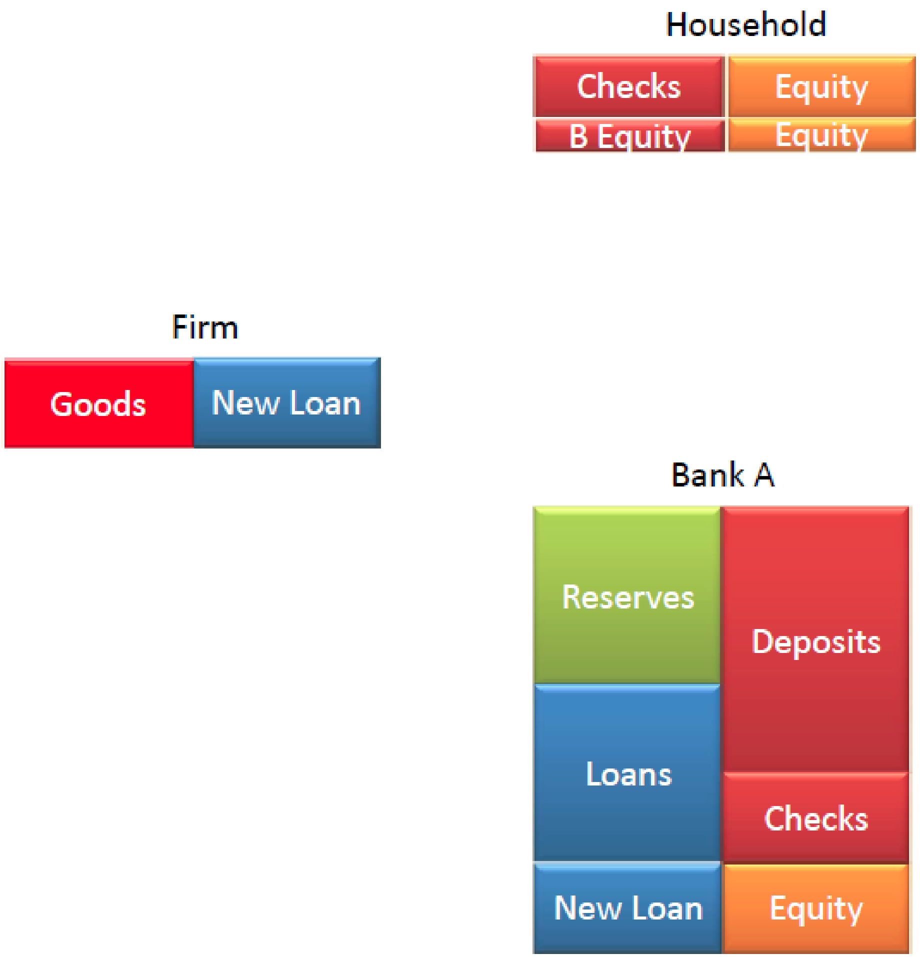


Examples: Credit to Firms
Allows firms to Produce by Hiring Workers

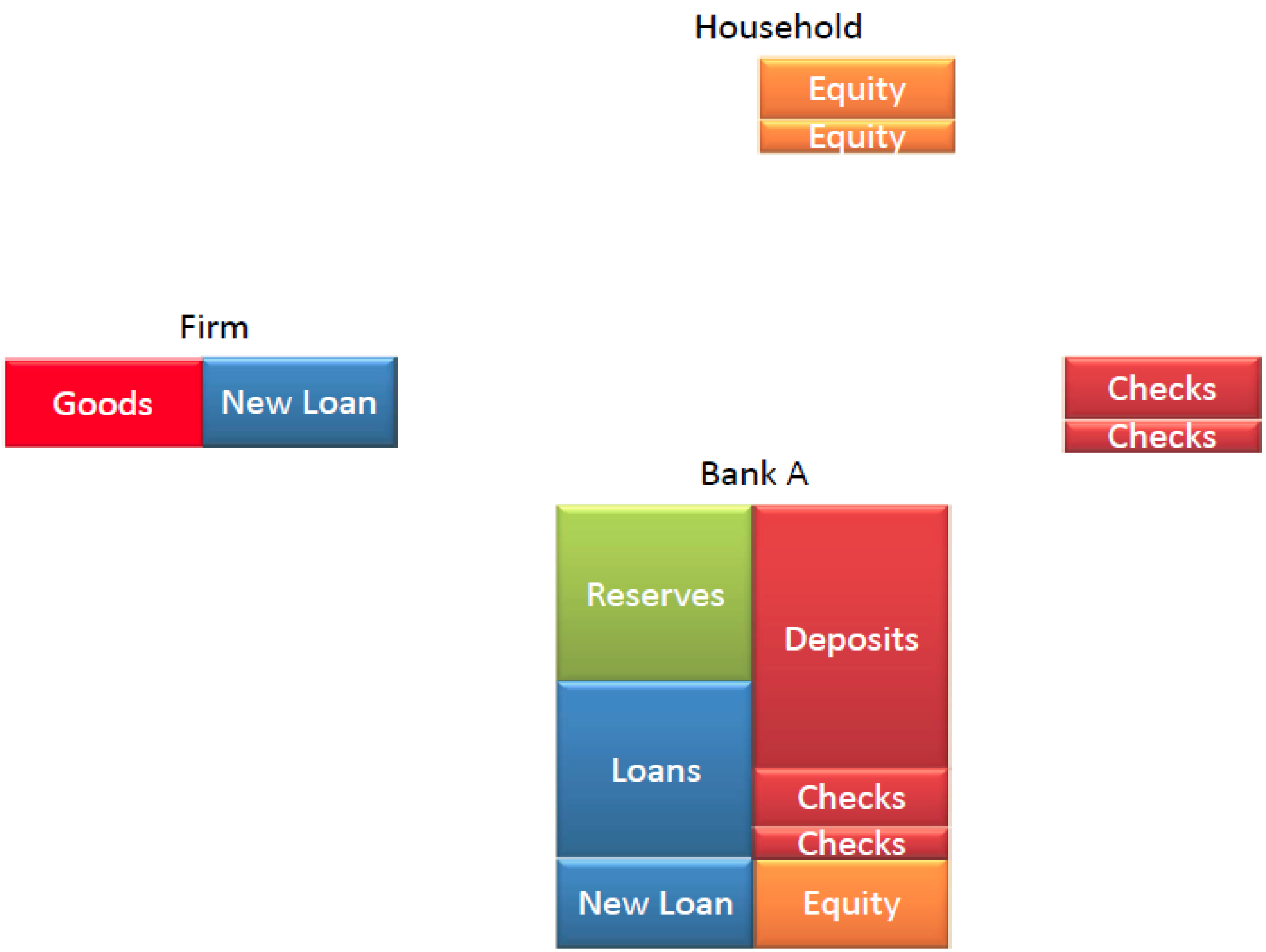


Firms hire Workers by using credit lines

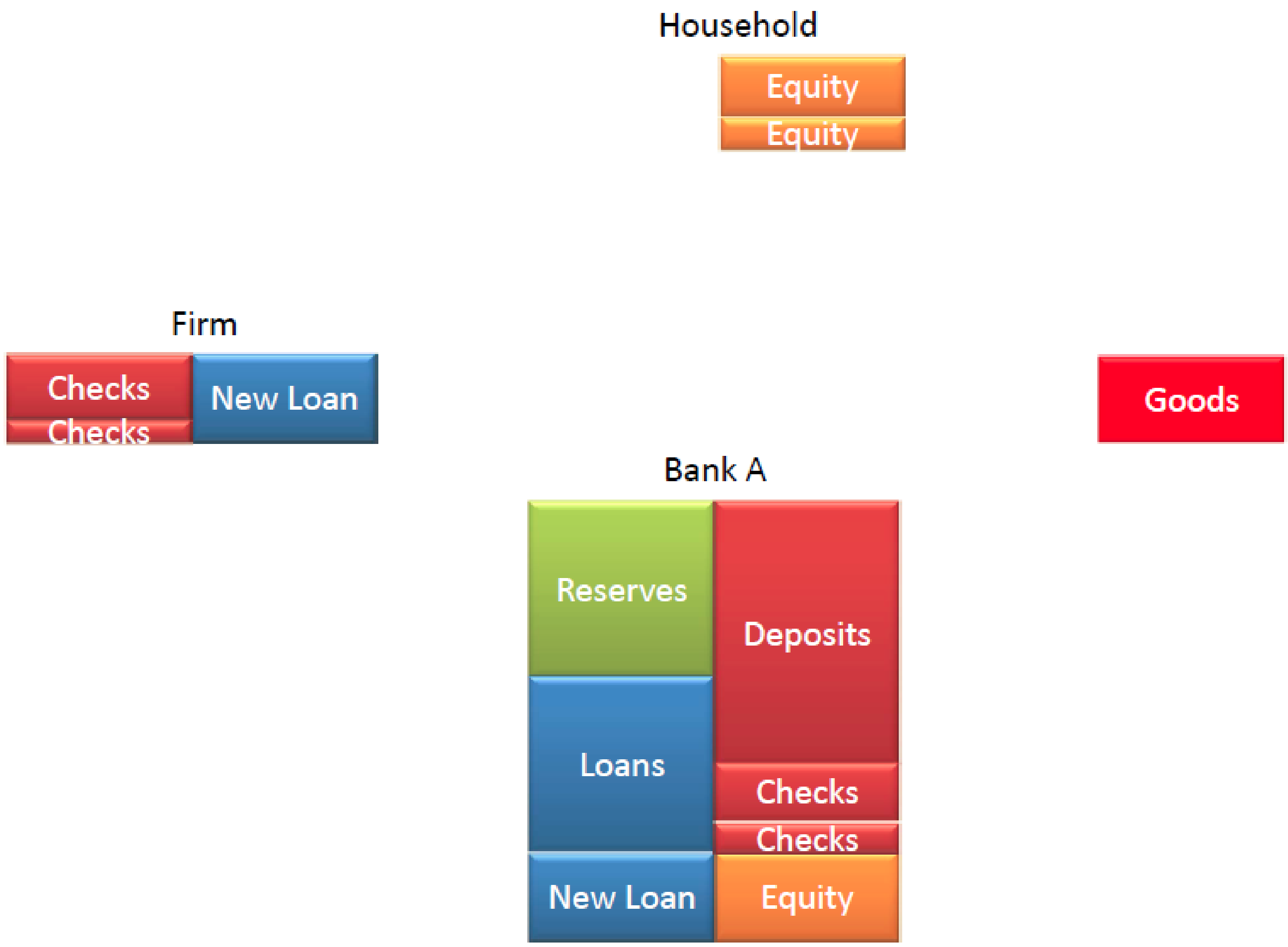
Examples: Banking Profits go to Households



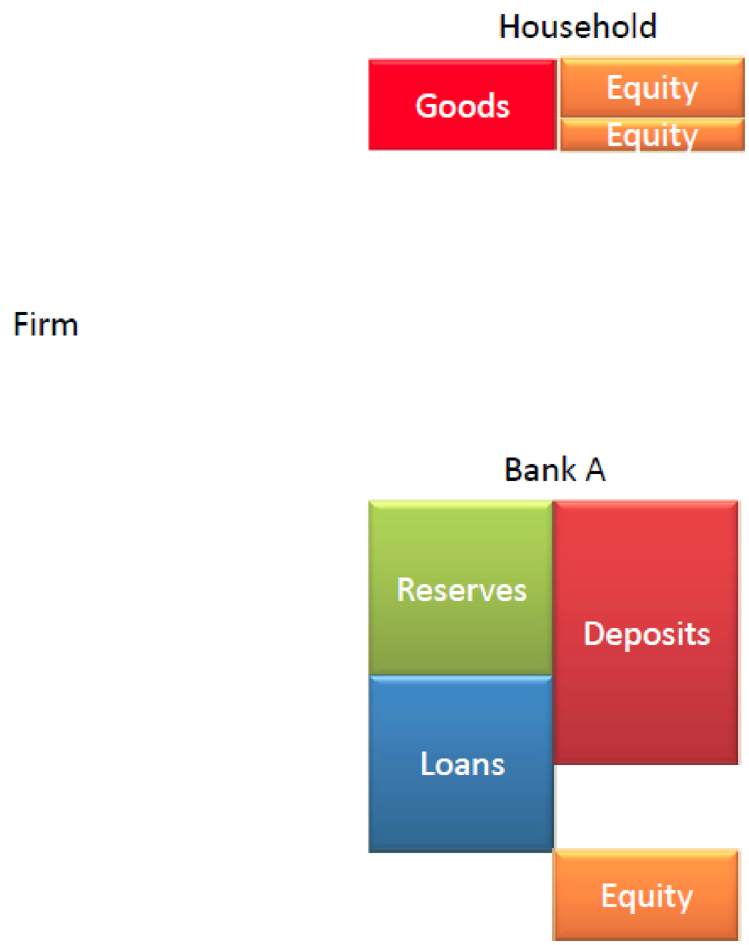
Households use Money to buy goods



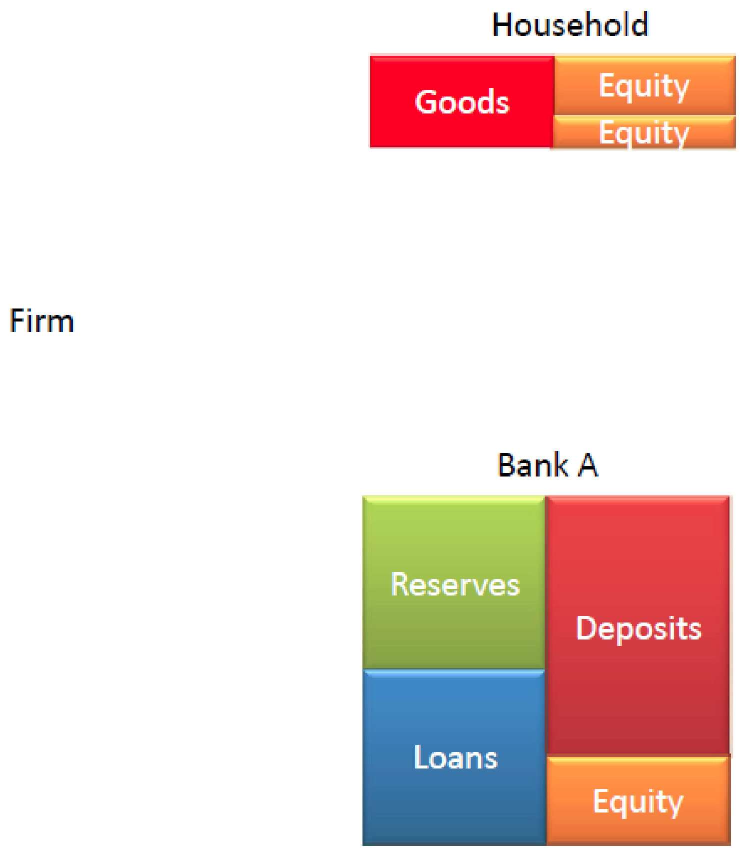
Purchases gives firms cash-flow Supports Trade



Firms' settle debts
Households can consume and invest



Starting Point



Monetary Policy Tools

Policy Instruments

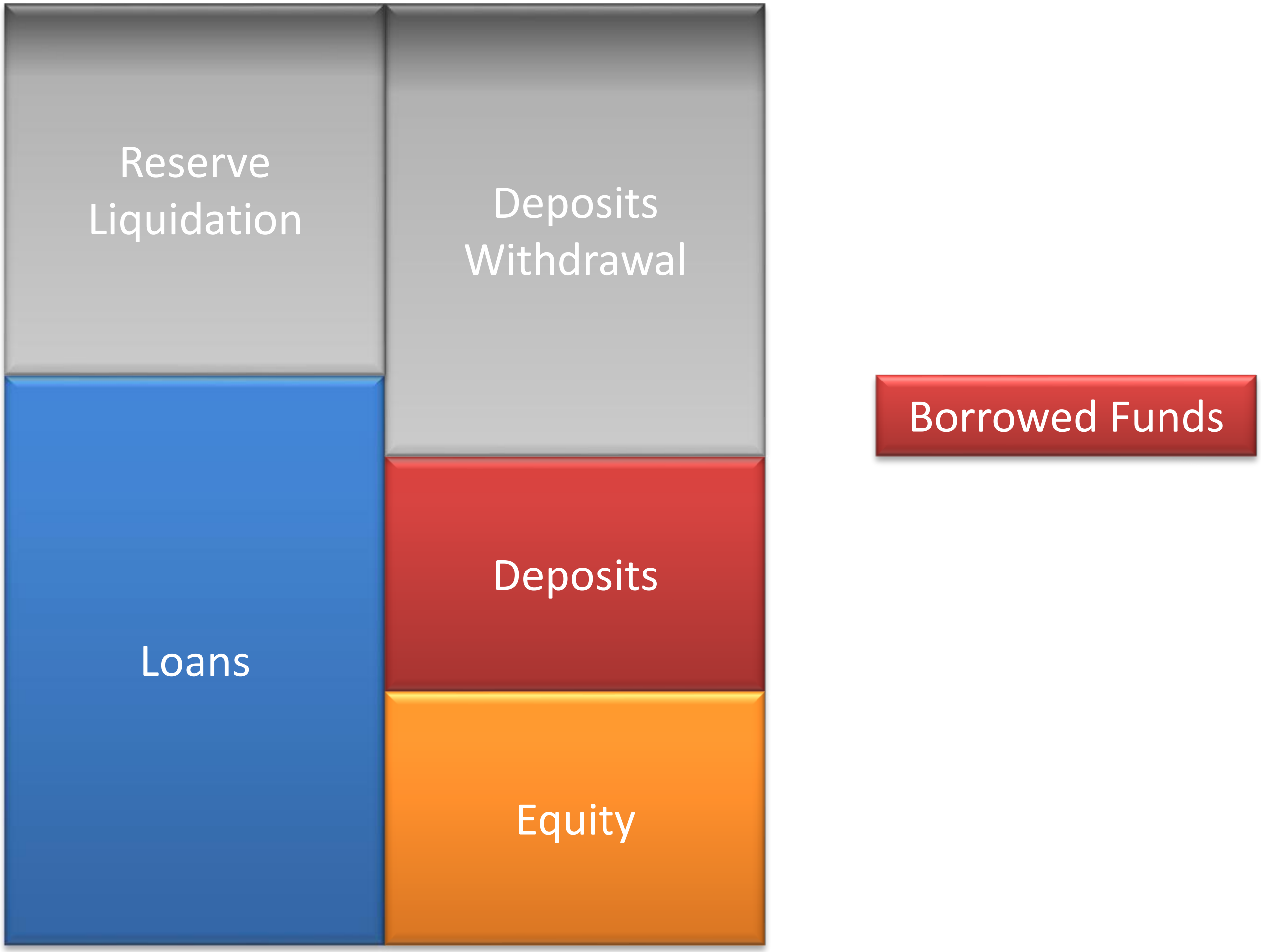
- Typically 3
- Reserve Requirements
- Open Market Operations
- Discount Window

Today

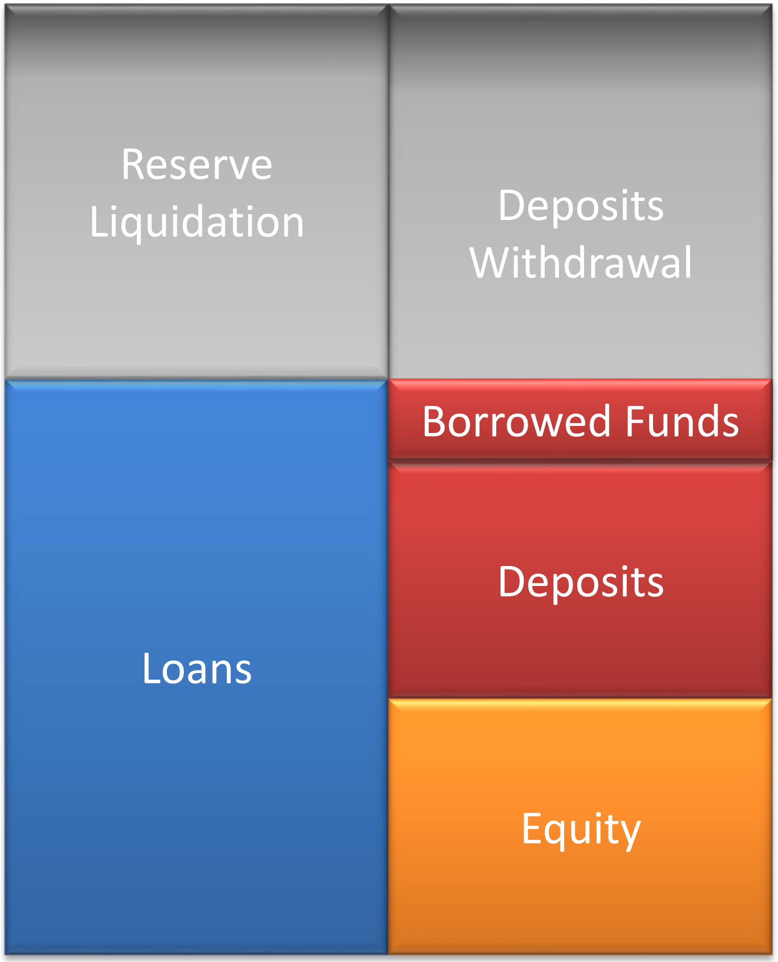
- Typically 3
- Reserve Requirements
- Open Market Operations
- Discount Window

Discount Window

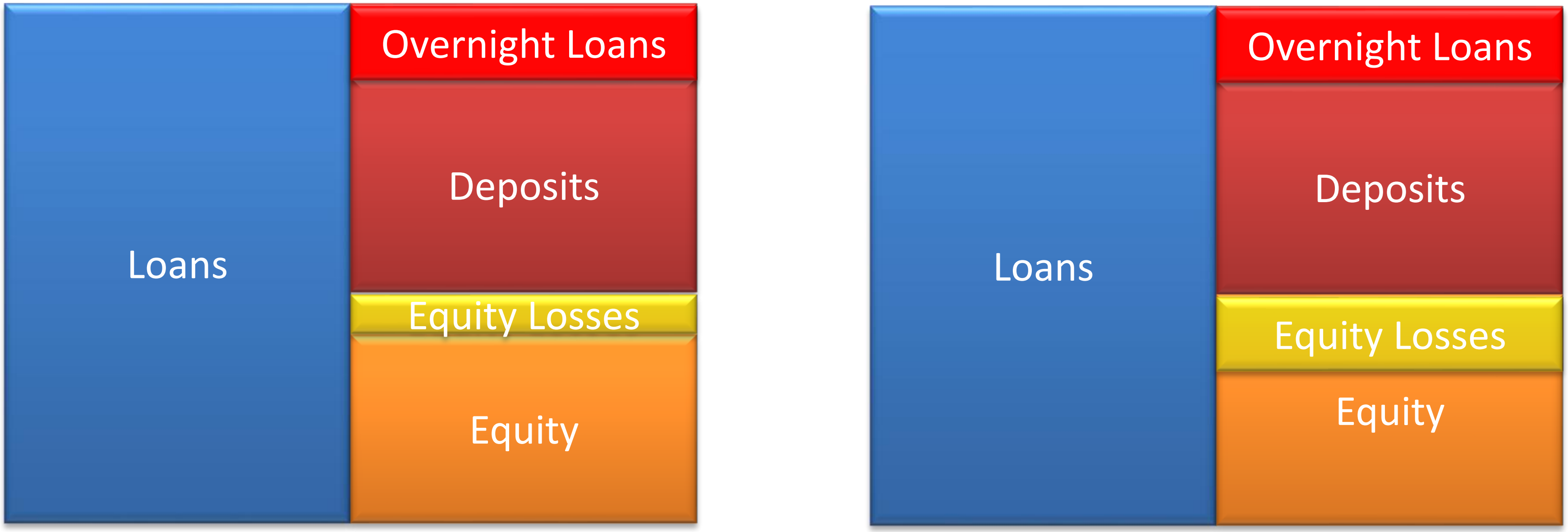
Recall Bank Short of Reserves



Borrows Funds



The FED offers overnight loans



Lower losses if short of reserves when FedFunds Rate is low

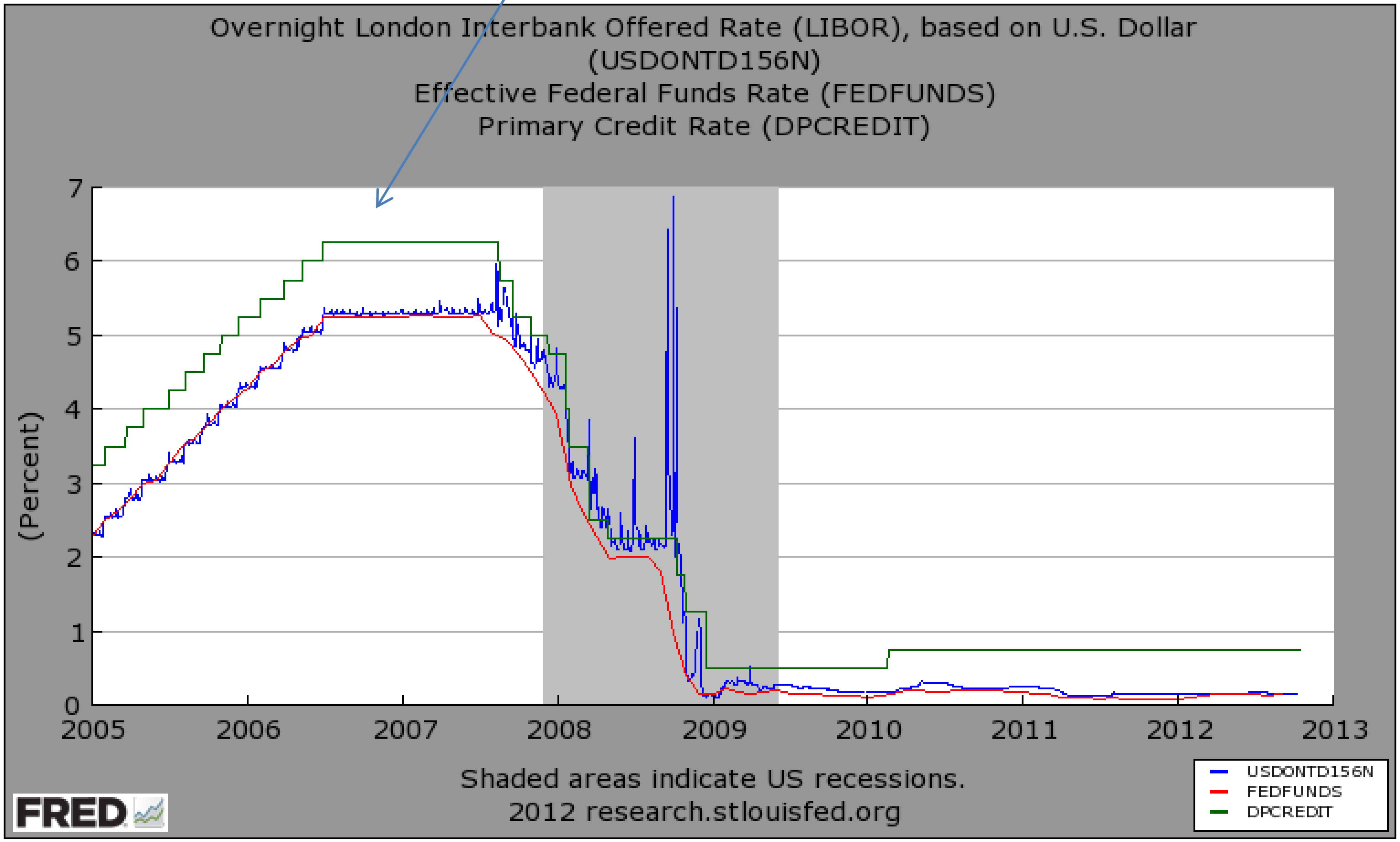
Effects of Lower Discount Window

- Banks will make more loans
  - Borrowing from Central Bank is cheaper
  - Banks lending more, losses associated with withdrawals are lower

- After withdrawal, interests will be lower
  - Central Bank is providing more loans

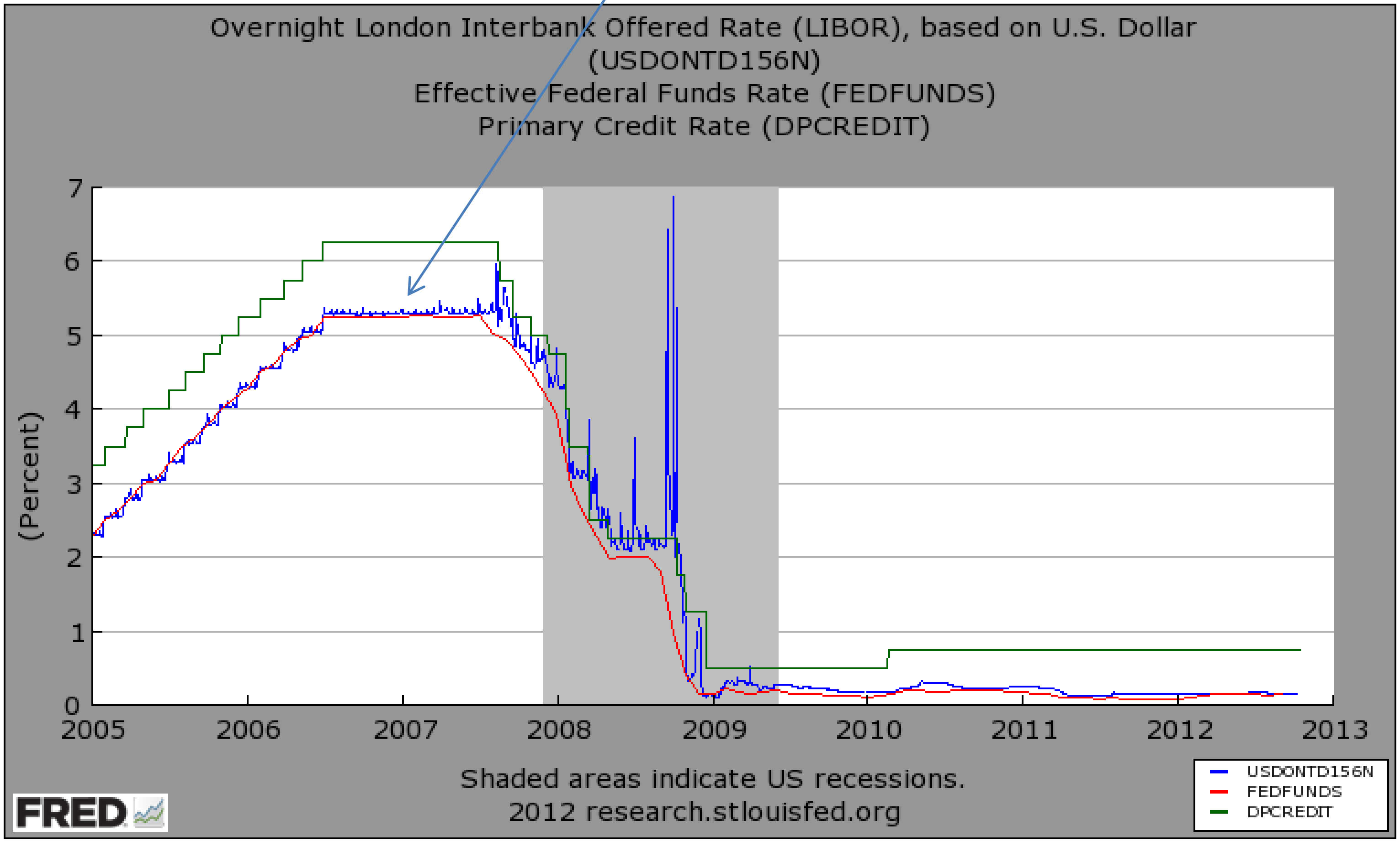
Effects of Discount Window

Fed picks
discount rate



Effects of Discount Window

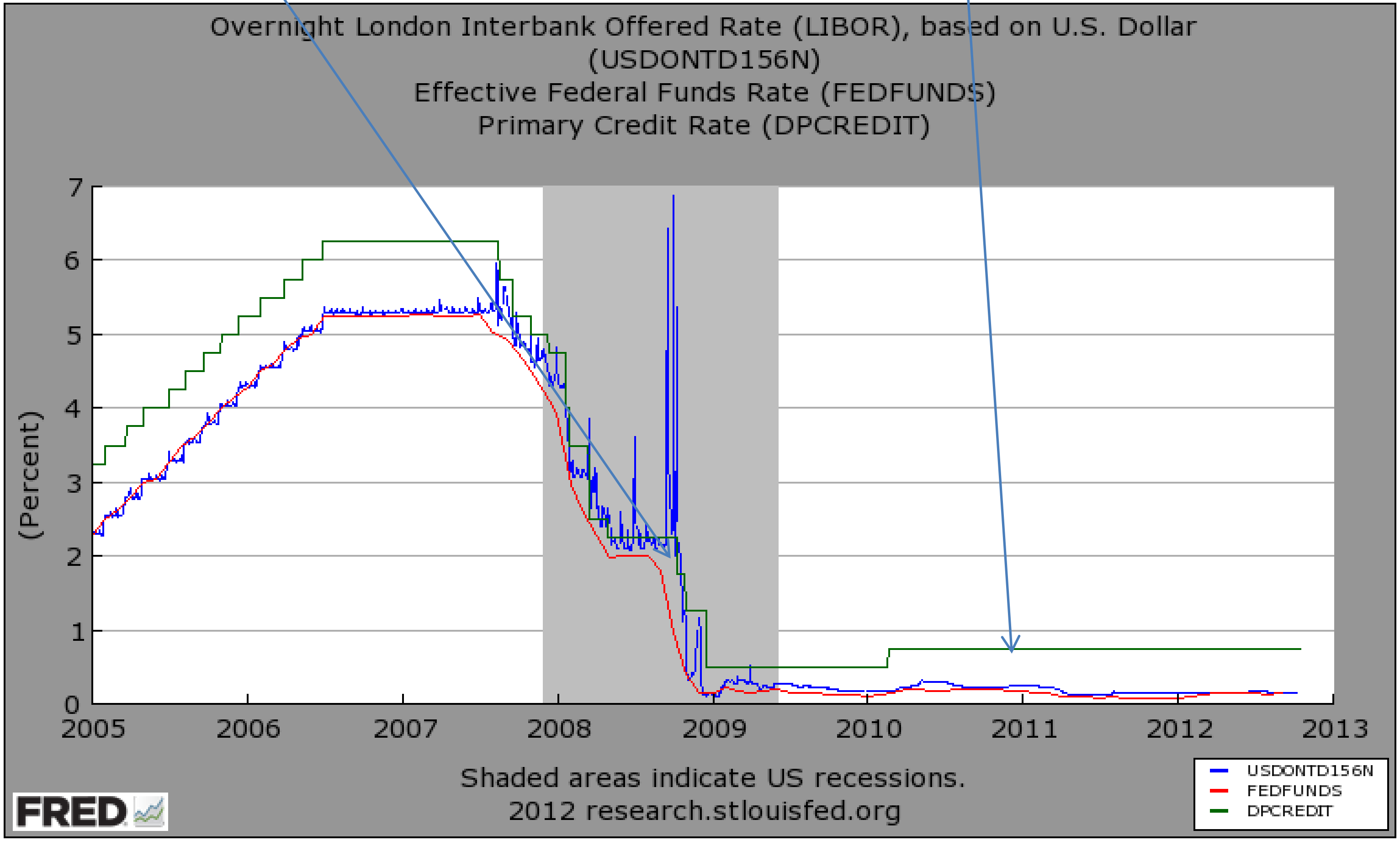
To affect this
FedFunds Rate



Effects of Discount Window

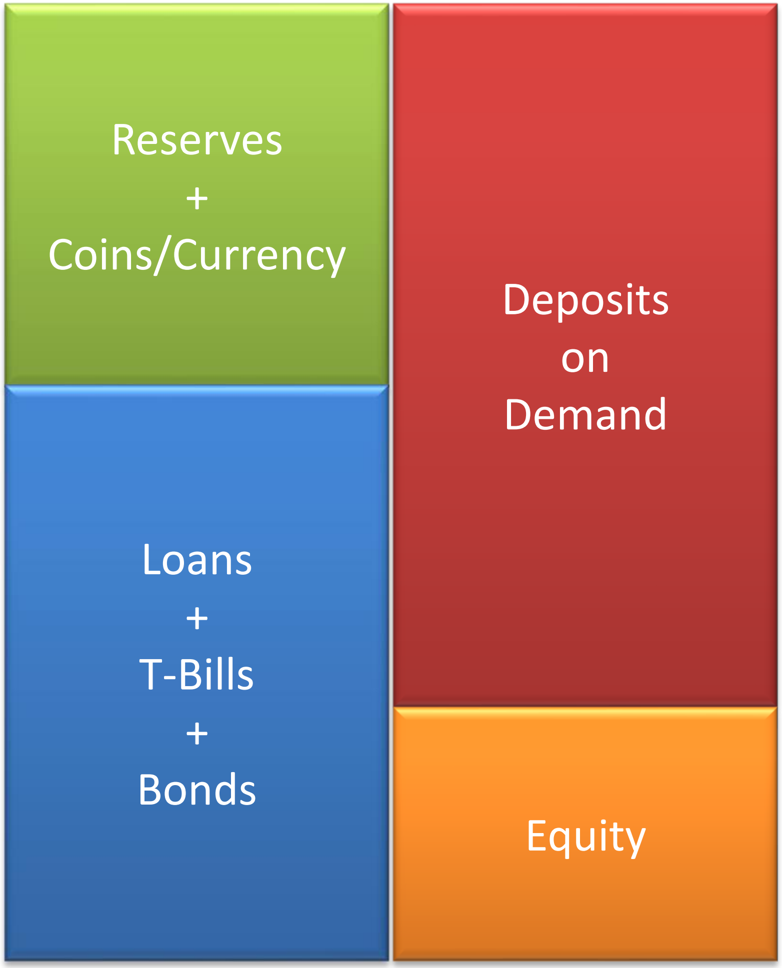
Lost Control
During Crises

Cant really lower
rates any more

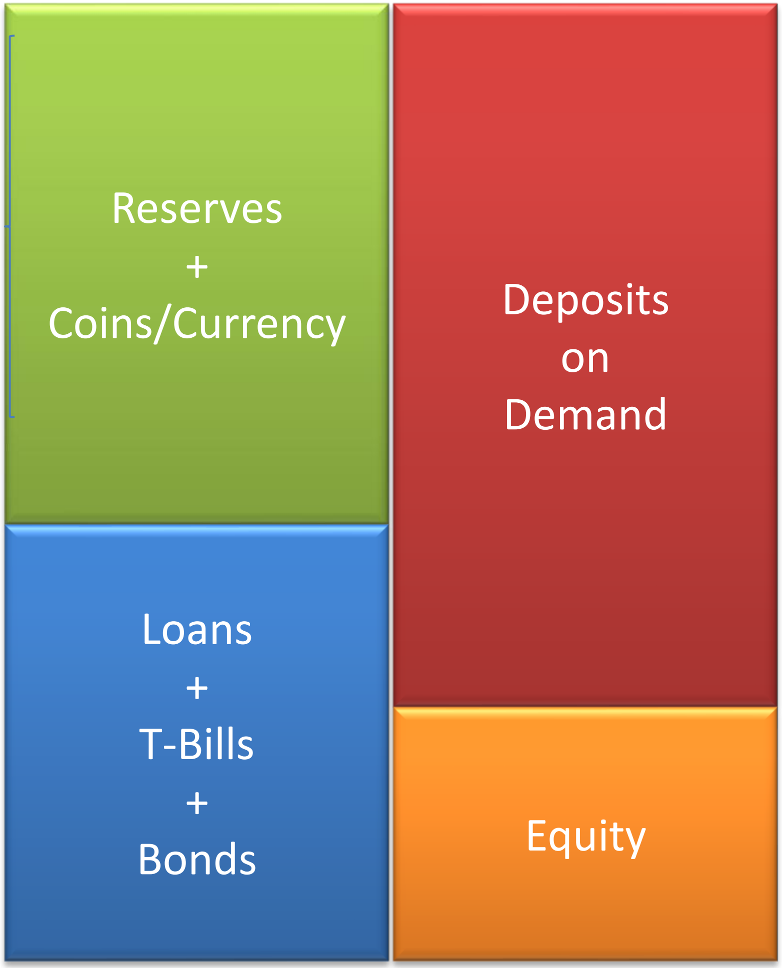


Open Market Operations

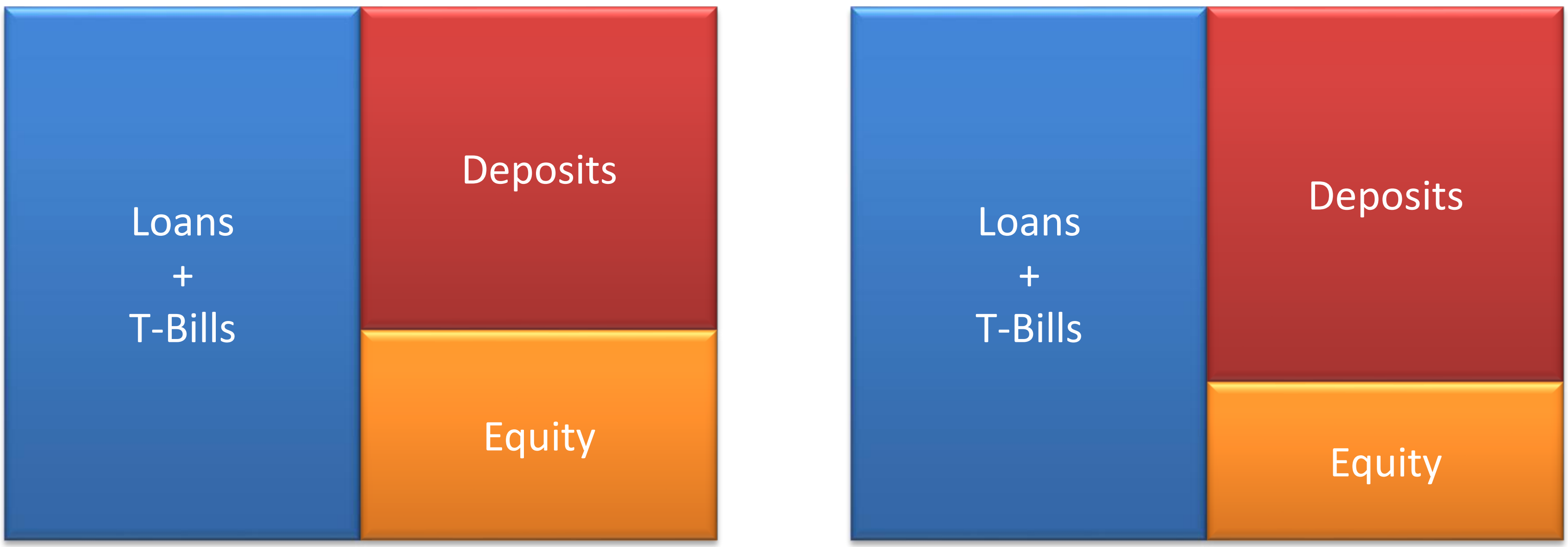
Bank's Balance Sheet



FED Buys T-Bills



After a Withdrawal



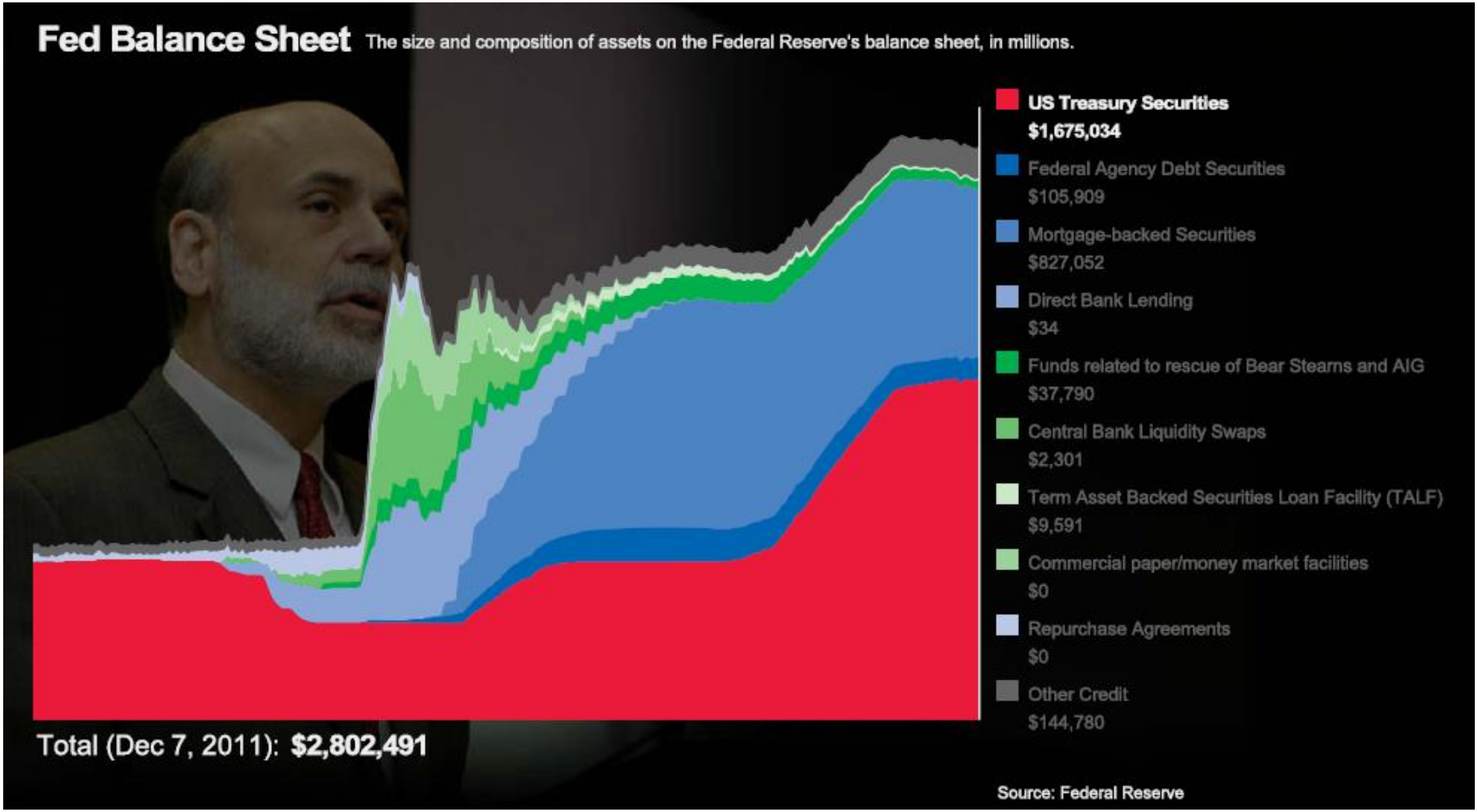
Effects Open Market Operations

- Before withdrawal banks will make more loans
  - There are more reserves to buffer withdrawal
- After withdrawal, interest will be lower
  - Some other bank will have more reserves

Open Market Operations

- Traditionally swap of T-Bills for Reserves
  - Typically Short Term
- Recently FED bought different assets
  - TARP, TALF, MMLF
- Operation Twist
  - Bought long-term paper
  - Twist the yield curve

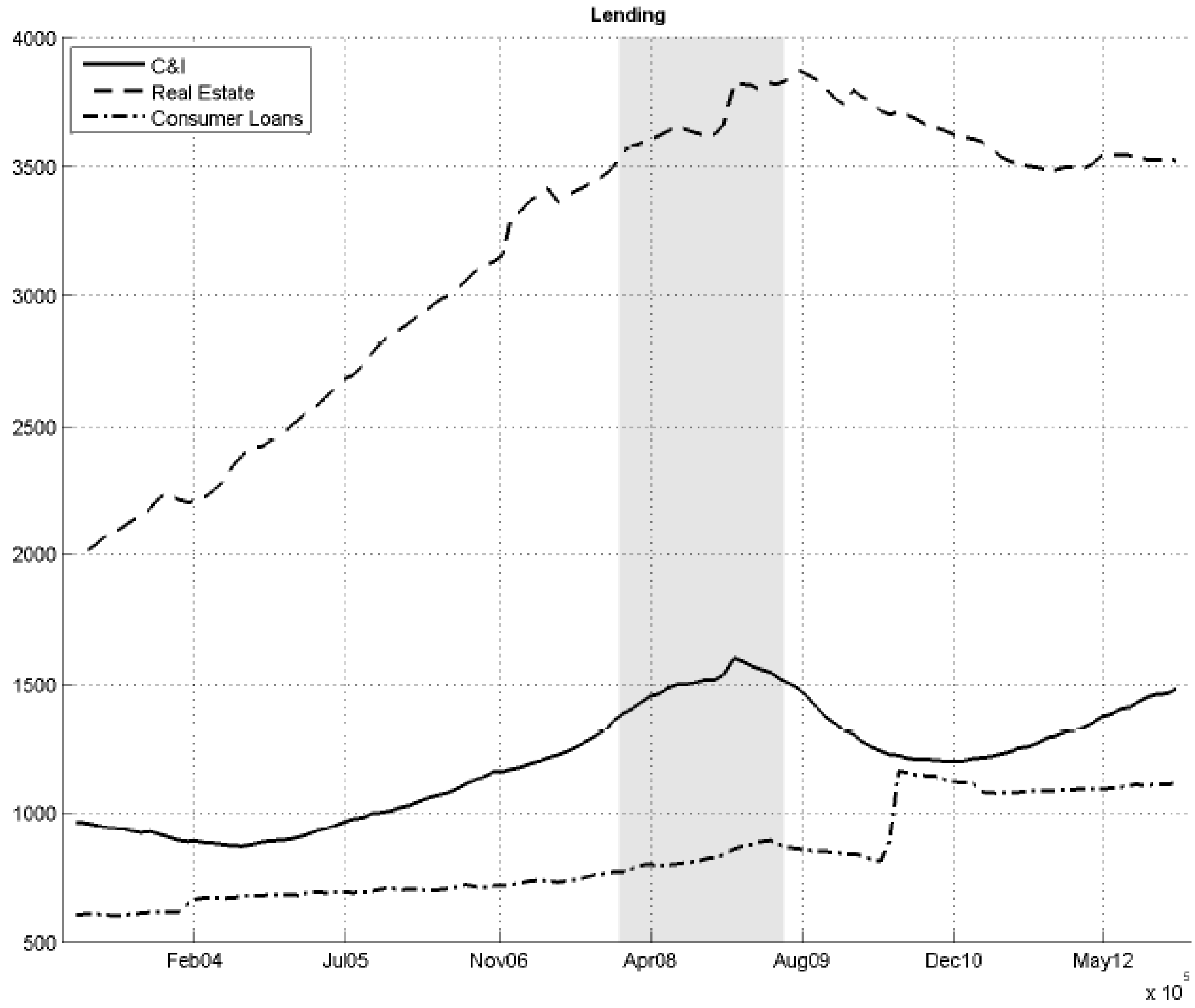
Unconventional Policy



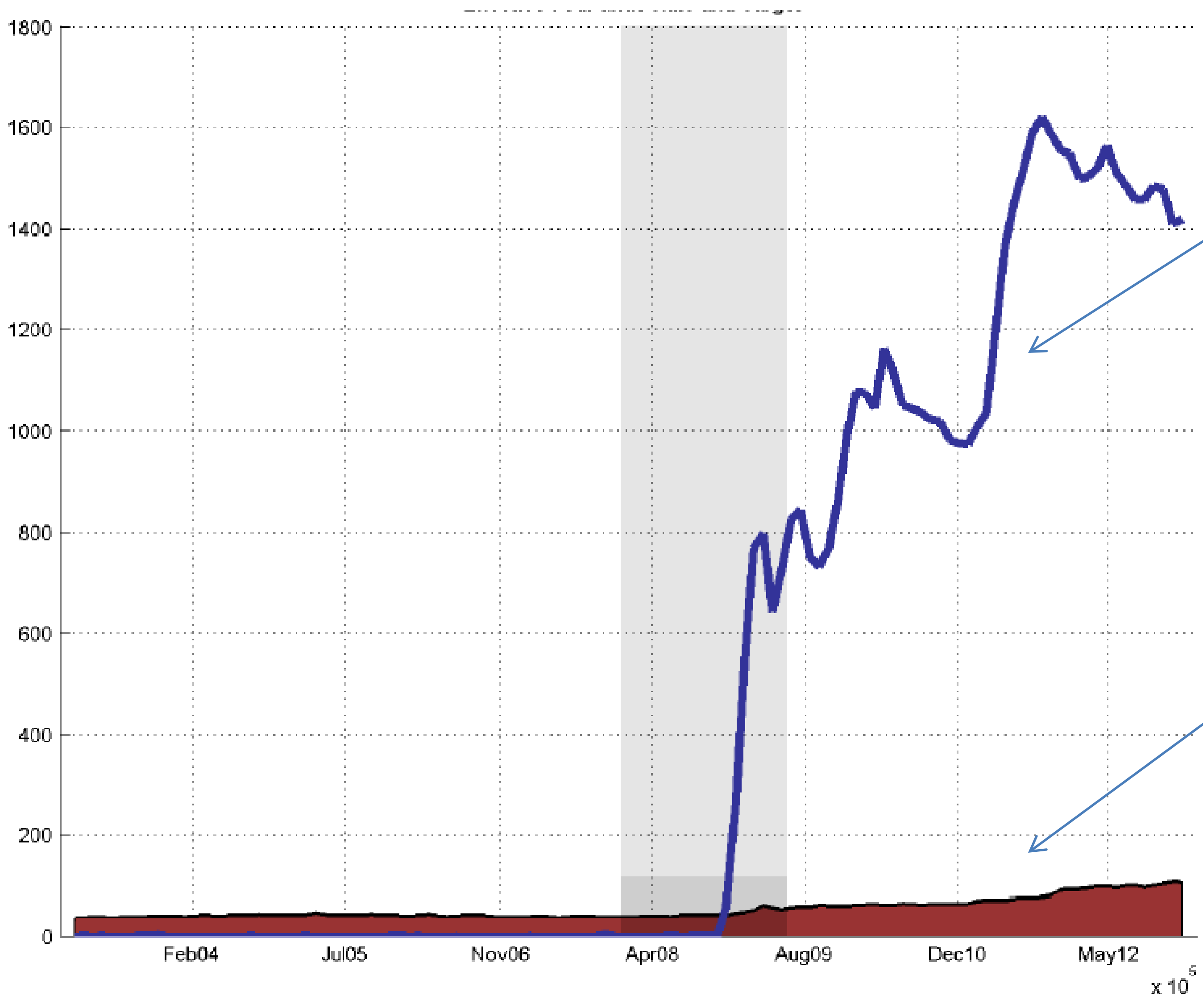
Where is the Money?

Where is the Money?

It’s Certainly not here….



It's actually here…



Banks are keeping reserves and not making loans

(top excess reserves, bottom required Reserves)

Global Economic Environment

Professor Saki Bigio

Course Roadmap

ECONOMIC GROWTH | **BUSINESS CYCLES** | **GLOBAL IMBALANCES**

<u>Sessions 1-5</u>

1. National Accounts
2. Growth Accounting
3. Convergence
4. Productivity
5. Cons & Invest
6. Labor Markets

<u>Sessions 7-11</u>

7. Recessions and Recoveries
8. Business Cycle Facts
9. Monetary Policy - Implementation
10. Monetary Policy - Effects
11. Exchange Rates

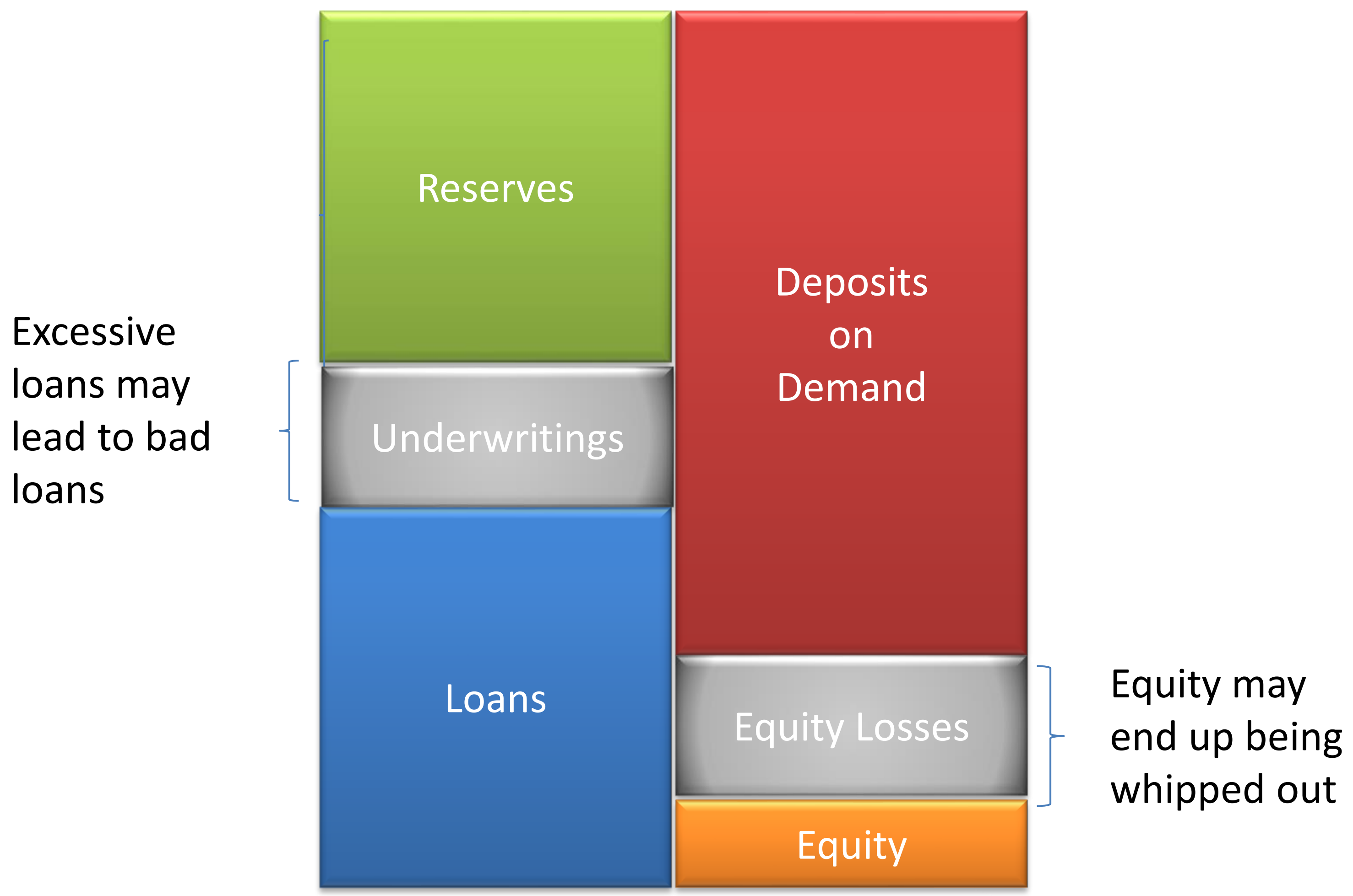
<u>Sessions 13-16</u>

12. Fiscal Policy and Debt
13. Global Capital Flows I
14. Global Capital Flows II
15. Hyperinflation
16. Crises

Interpreting the Financial Crisis

Credit Risk
(Solvency Risk)

Bad Loans...


Excessive loans may lead to bad loans
Reserves
Underwritings
Loans
Deposits on Demand
Equity Losses
Equity
Equity may end up being whipped out

Effects of Equity Losses

- Banks are forced to make less loans in the future
  - All at the same time, very risky
- May lead to liquidity risk
  - No cash-flow from bad loans
- Uncertainty leads to collapse of interbank market
  - Who's in bad shape?
  - Interbank market freeze
- Too-big-to-fail Problem
  - Reason to regulate banks
- Financial Regulation
  - Limit Leverage

The Shadow Banking industry

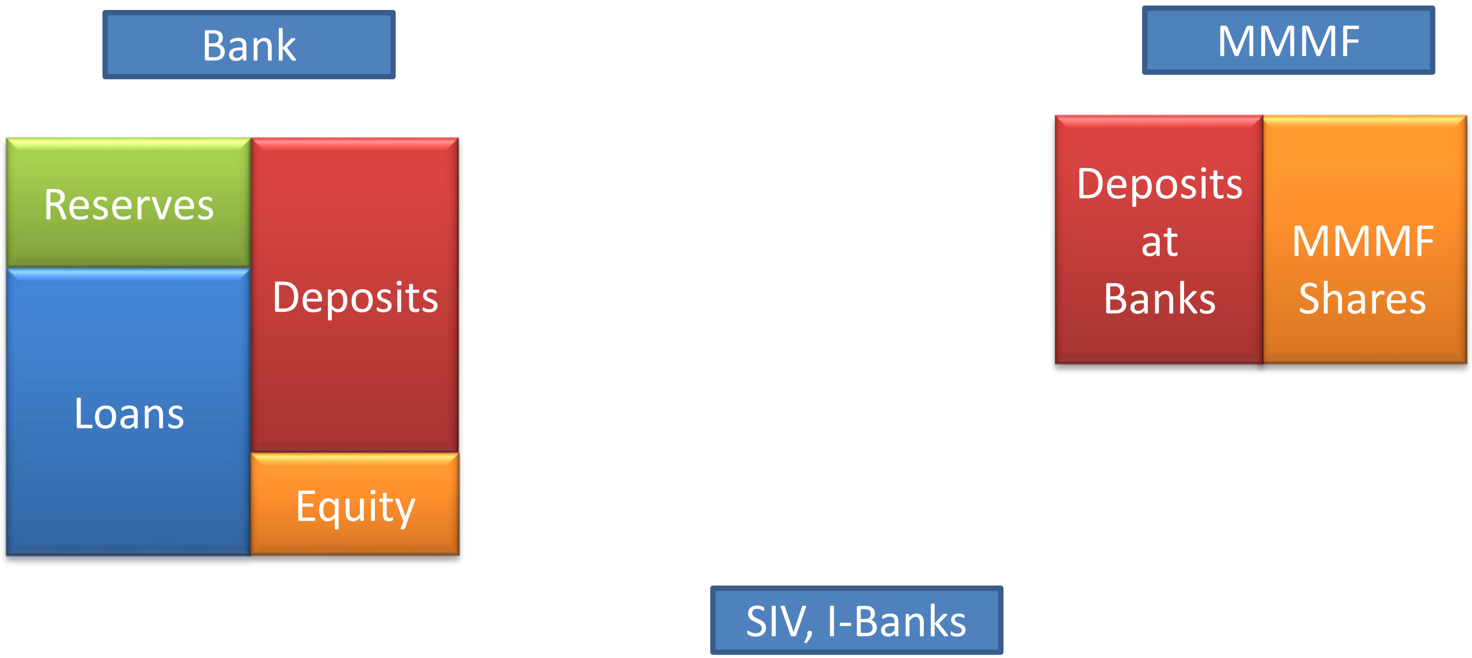
Monetary Policy and Fin Regulation

- Since 1990s a parallel banking system grew
  - Shadow Banking System

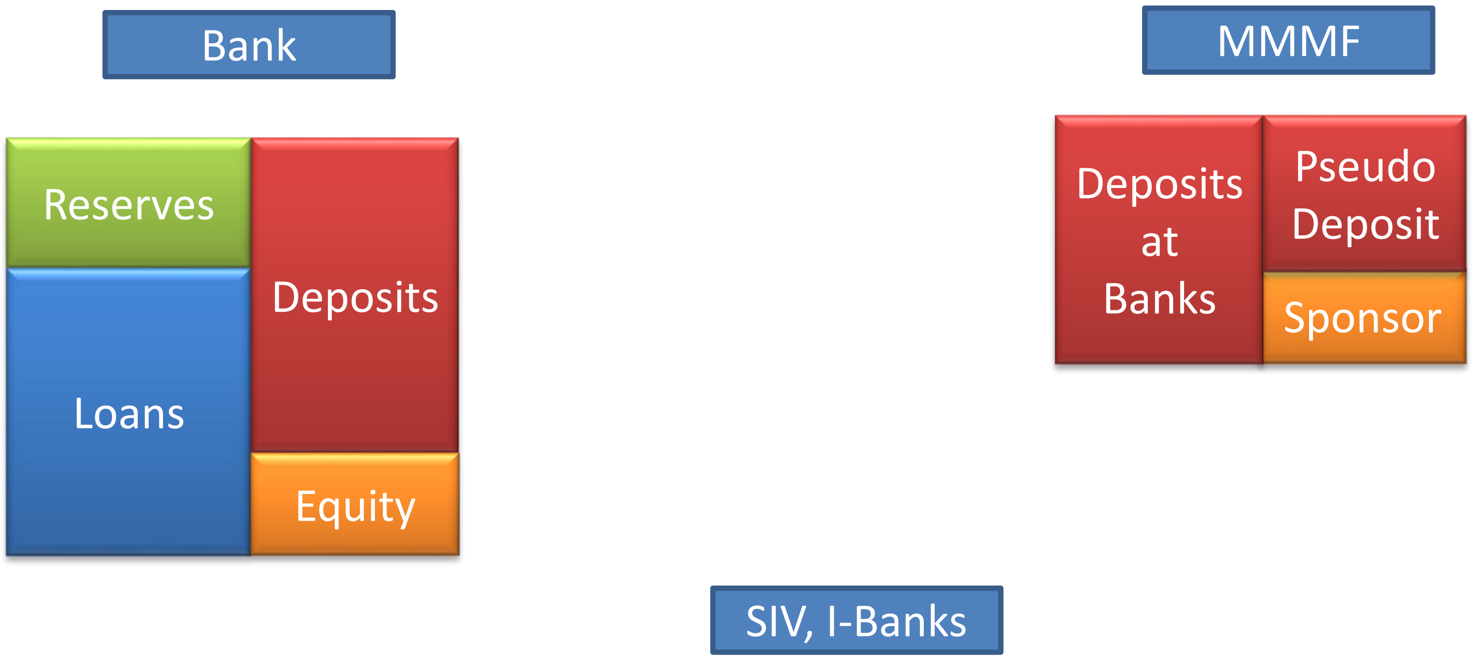
- Commercial Banks Off-loaded Mortgages
  - SIV, or Conduits

- Funded by Money Market Mutual Funds

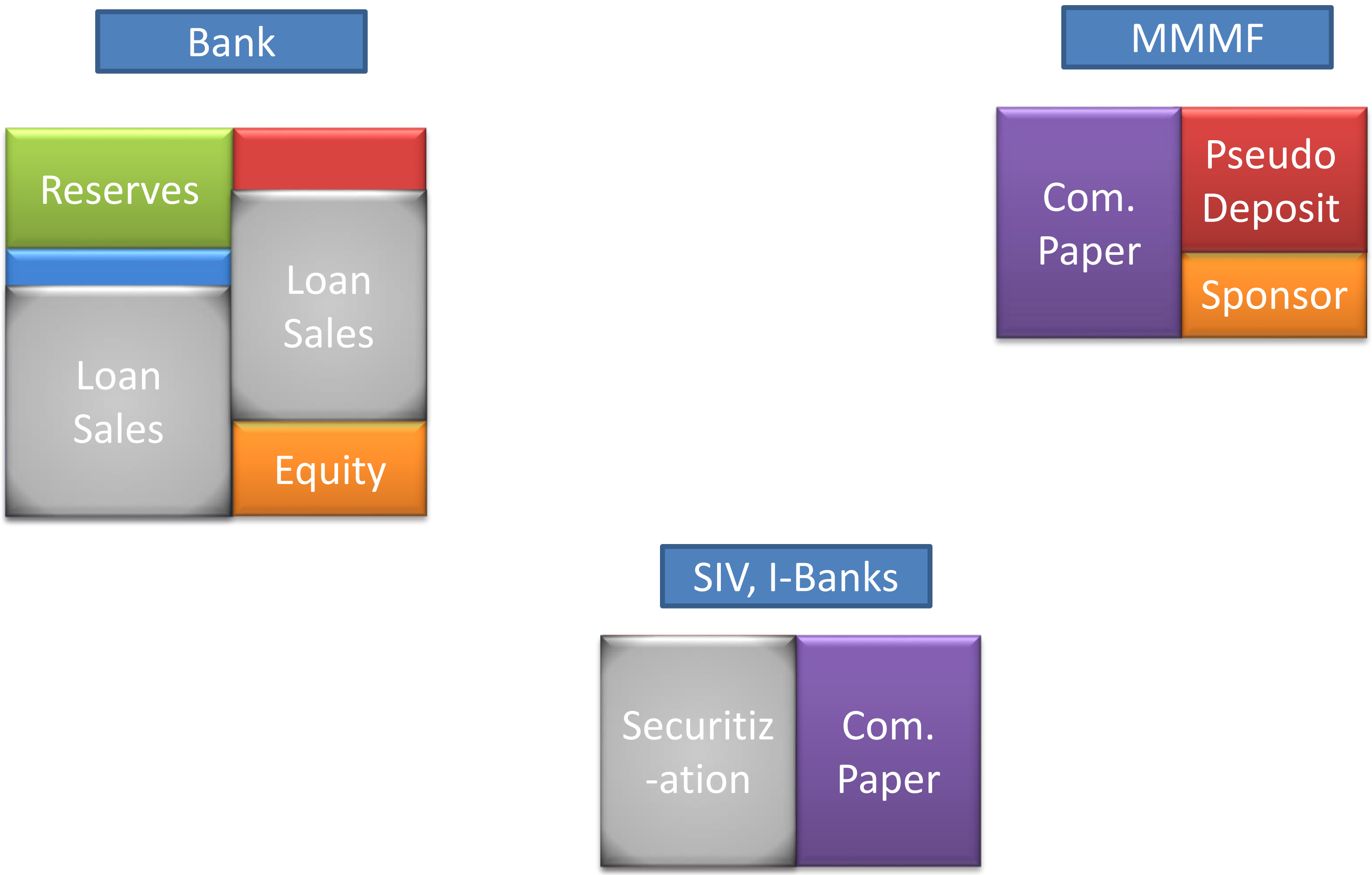
Shadow Banking Map



Shadow Banking Map



Shadow Banking Map



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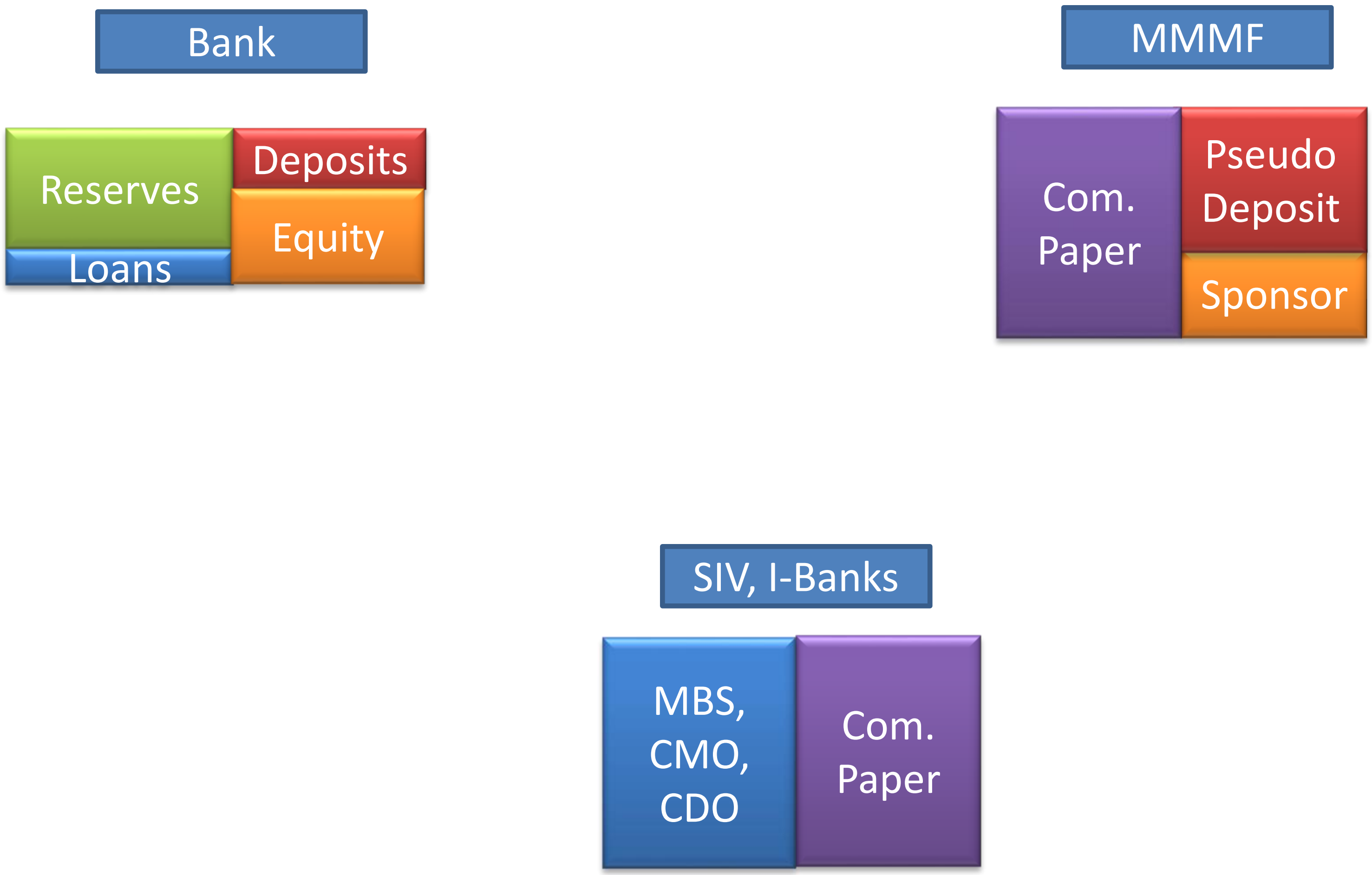
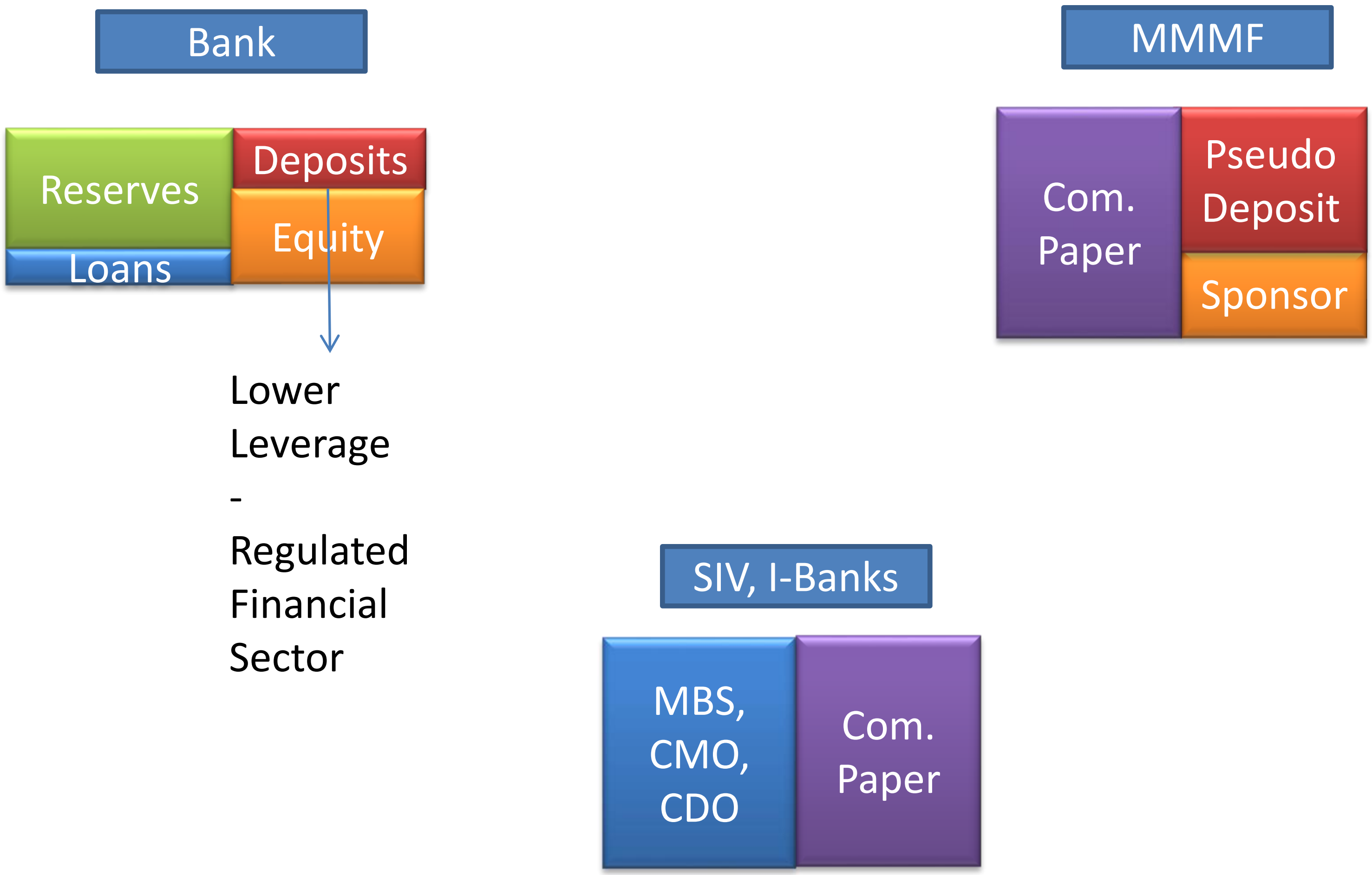
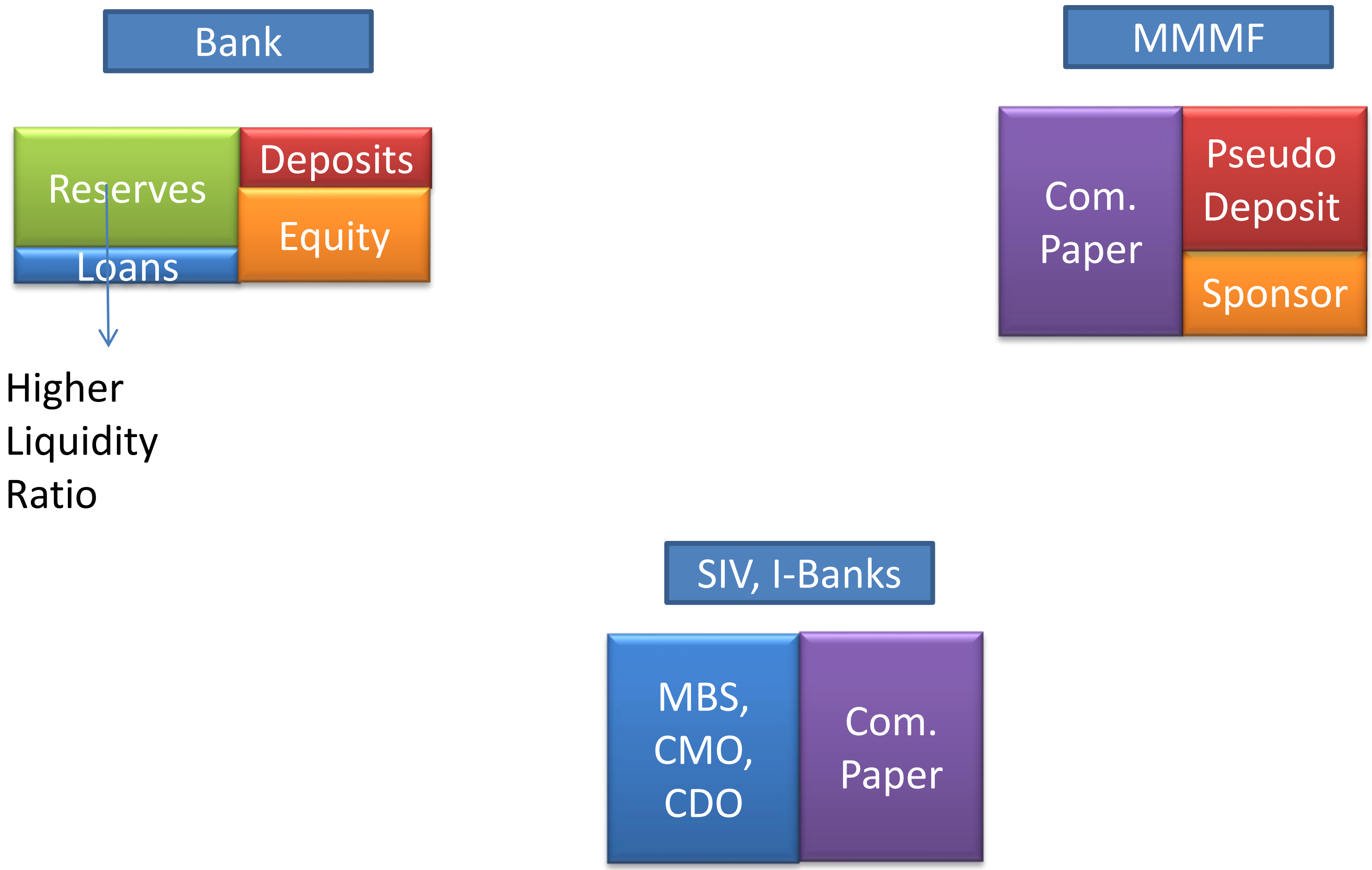


Shadow Banking Map



Shadow Banking Map



Summary of Shadow Banking

- Parallel Banking Sector
  - Operated off regulation sight
- In the aggregate
  - Same Financial System consolidated balance sheet
- It avoided regulation by showing better ratios
  - MMF grew because they pay interest
  - SIV's grew to off-load leverage
- Ratios where several times lower

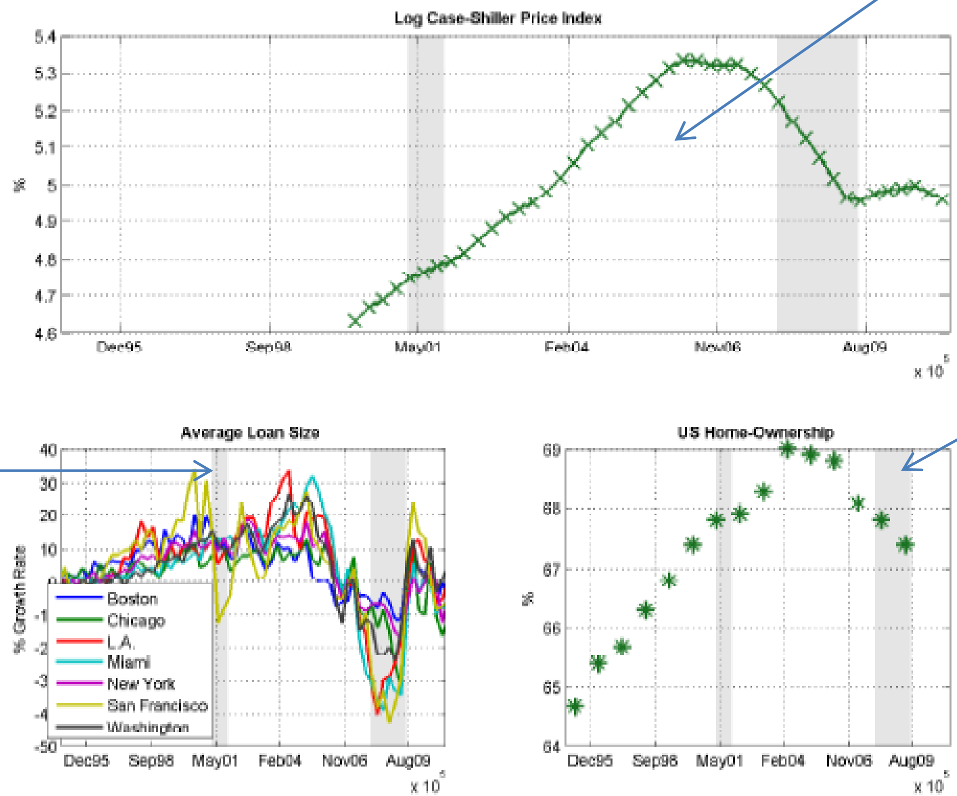
The Shadow Banking industry

Housing Market

- House prices rose steadily from the 1990s to 2006
- Ownership rate rose rapidly in the period
- Price correlations where low

Housing Market

Case-Shiller Index



Home Prices

Home Ownership

Figure: Home prices and ownership in the United States.

Sub-prime Mortgages

- Traditional mortgage
  - Substantial down payments

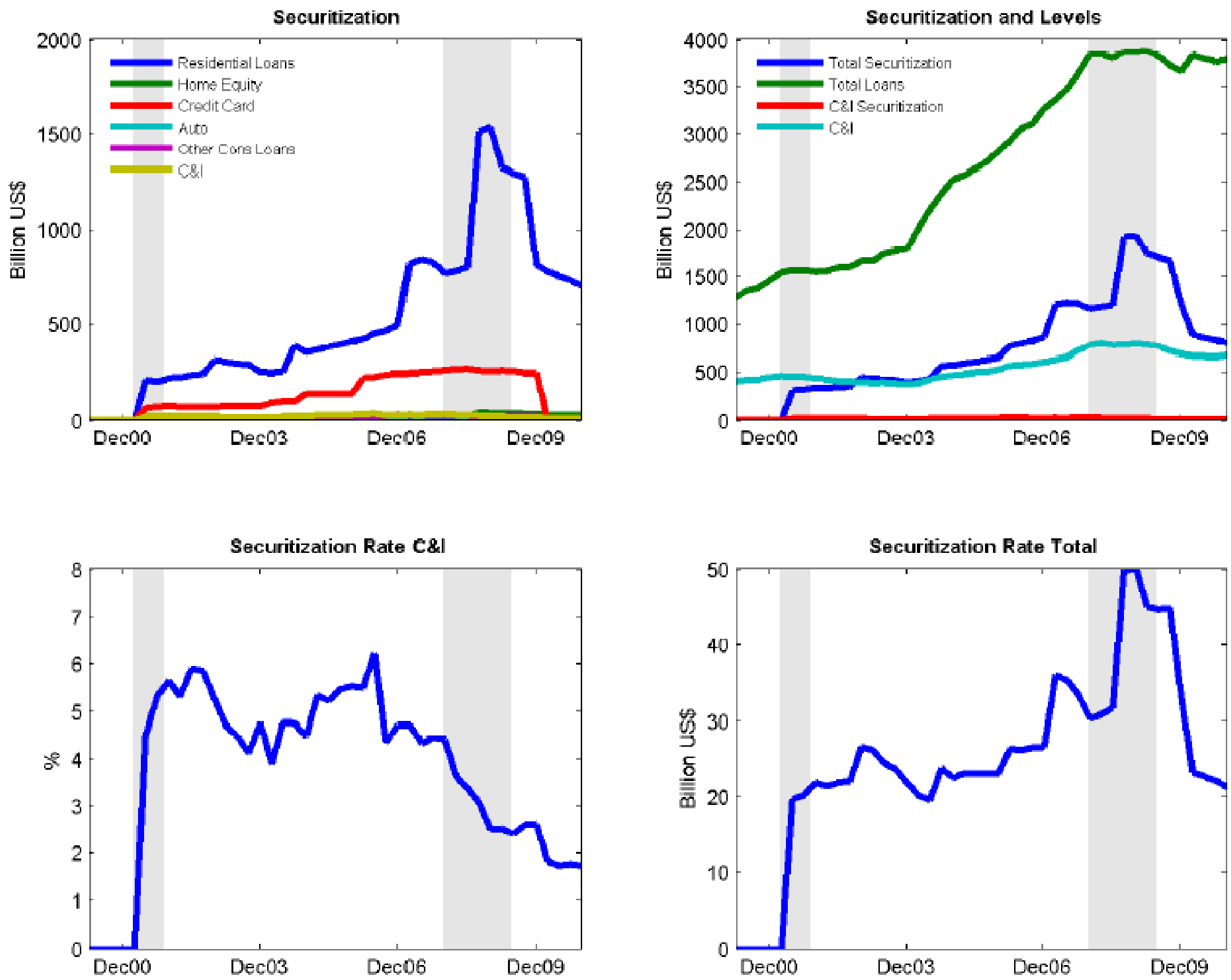
- Sub-prime
  - NINJA, low down-payment
  - As house prices rose, safe

- Borrower short of cash,
  - Can roll-over because higher value
  - Homes are collateral

The Rise of Securitization

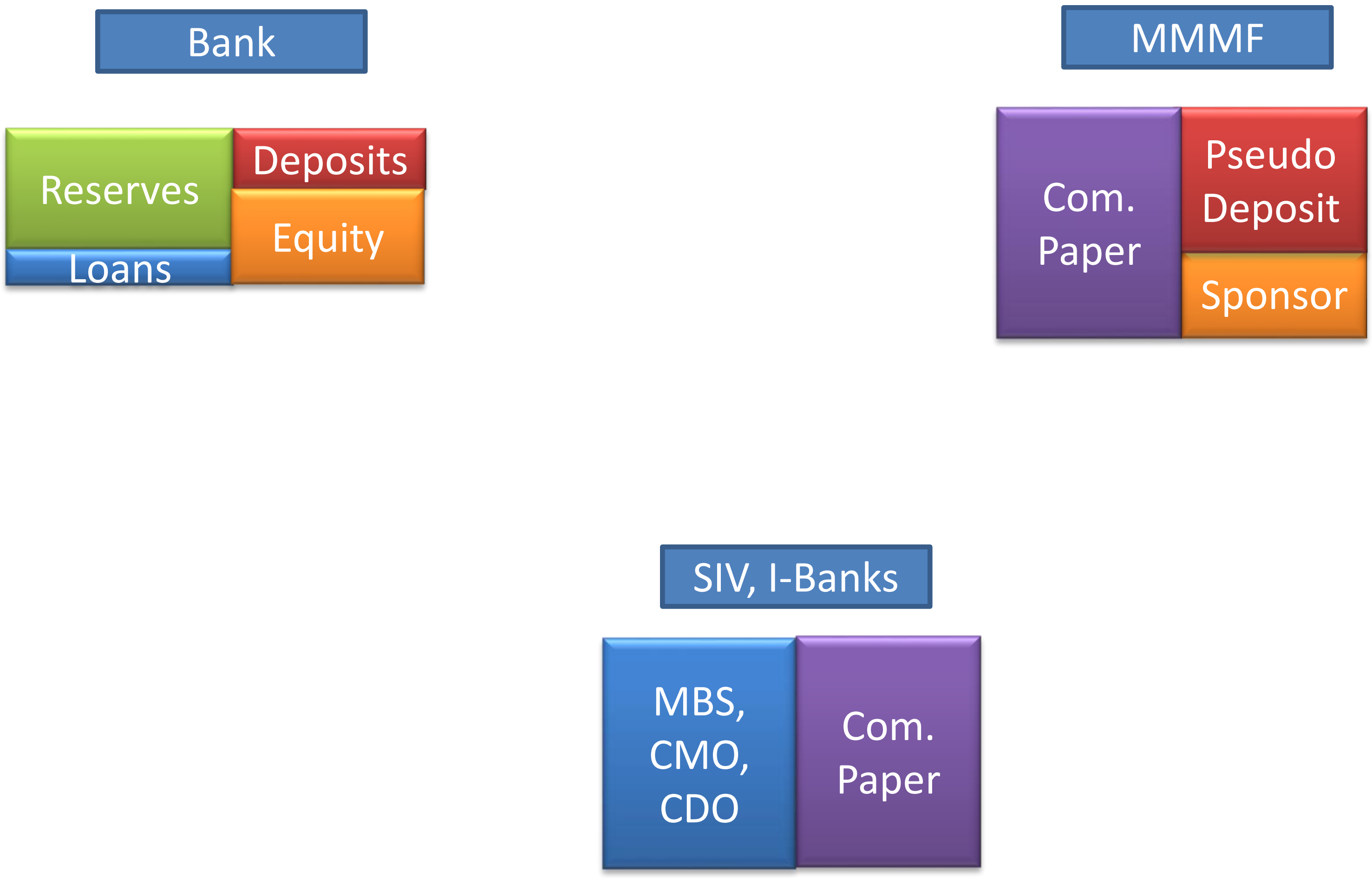
- Traditionally, bank loans on bank assets
- Now Securitization
  - Pooling - Tranching
    - Diversify and avoid Agency Problems
- Offload loans to unregulated intermediaries

Securitization

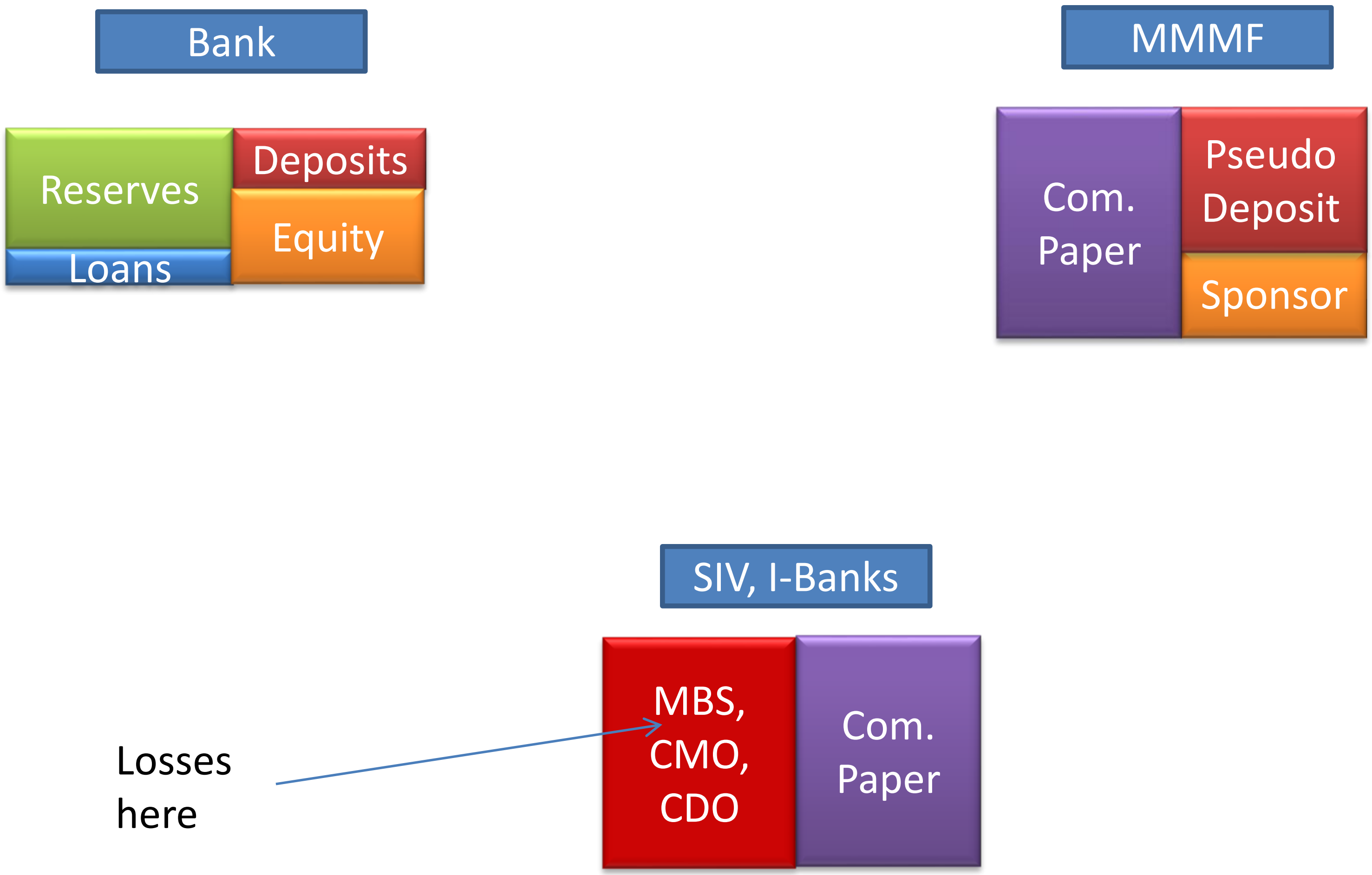


- One view of the problem:
  - True regulatory arbitrage
  - Systematic failure to identify risks and high correlation
- Securitization: grew assuming low correlations
- Problem: securitization itself, build correlations!

Shadow Banking Map



The Crisis Hits



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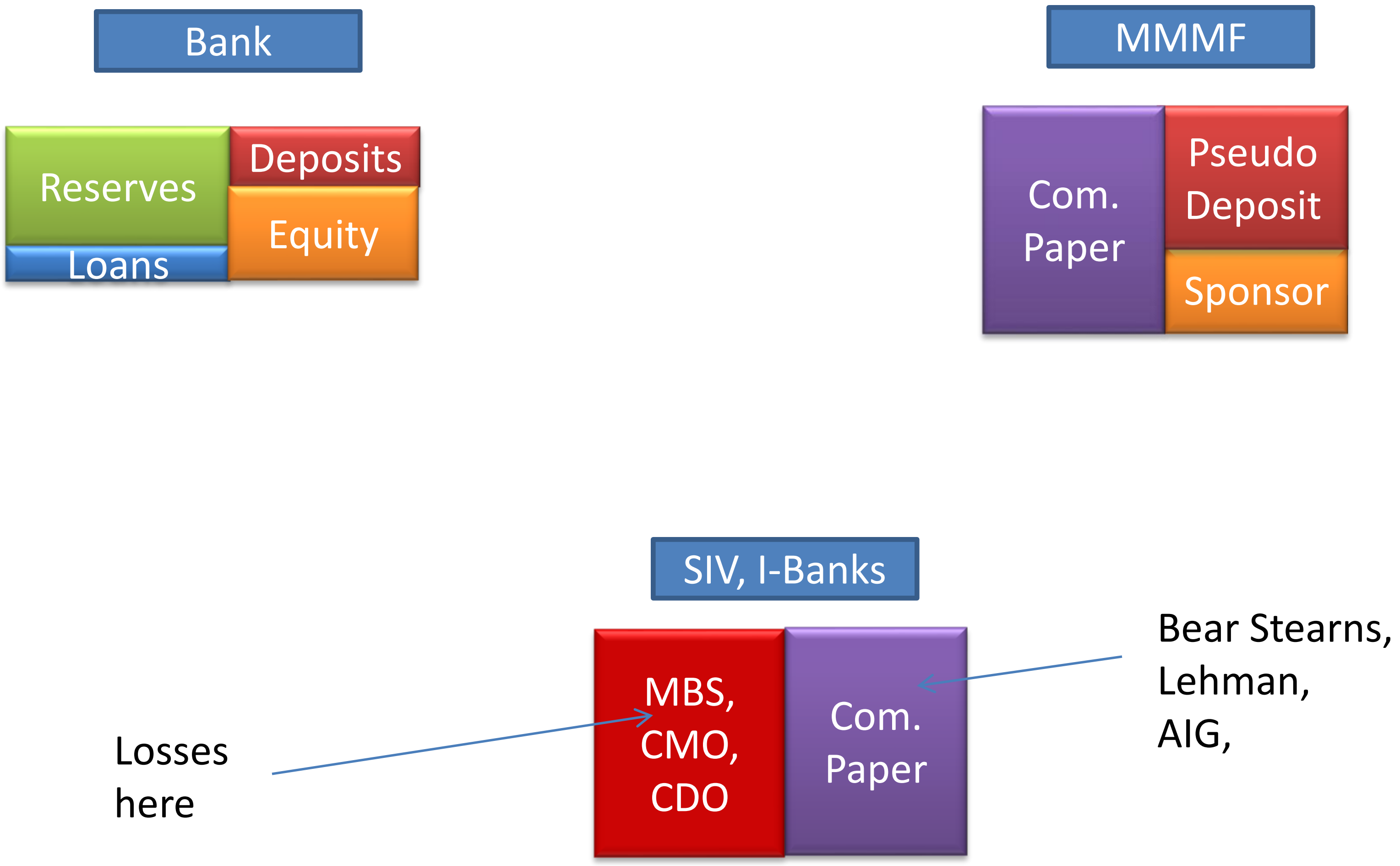
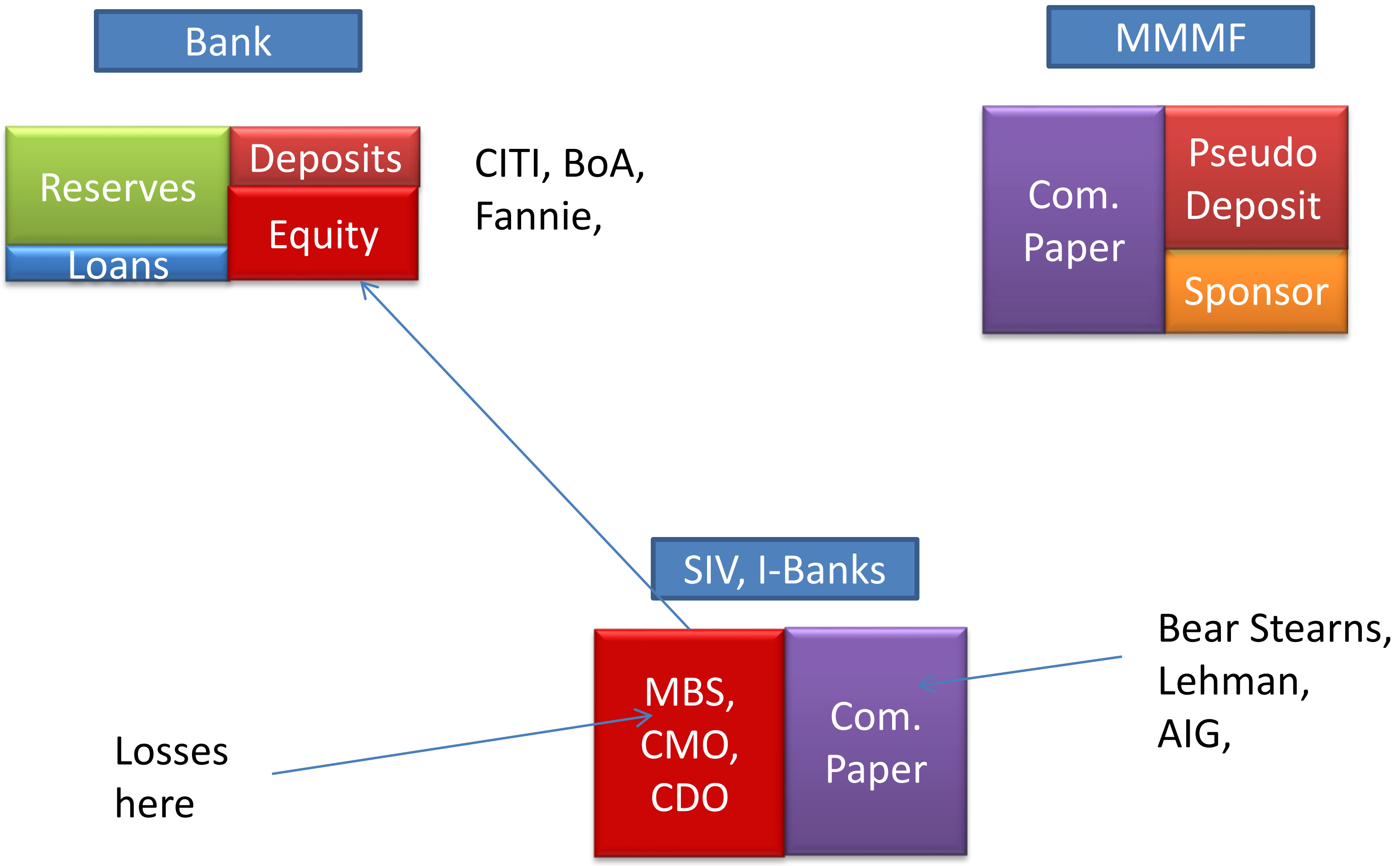


The Crisis Hits



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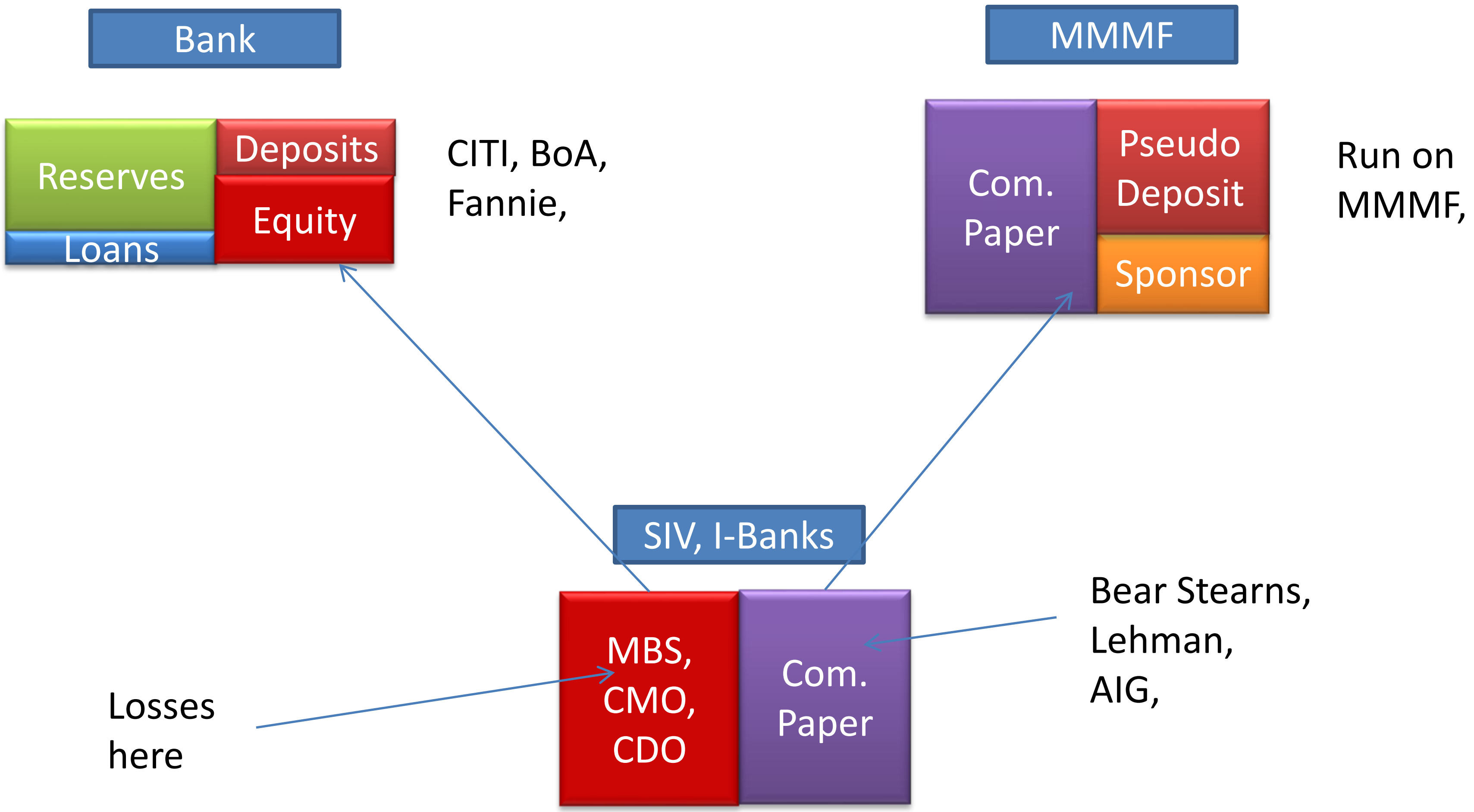
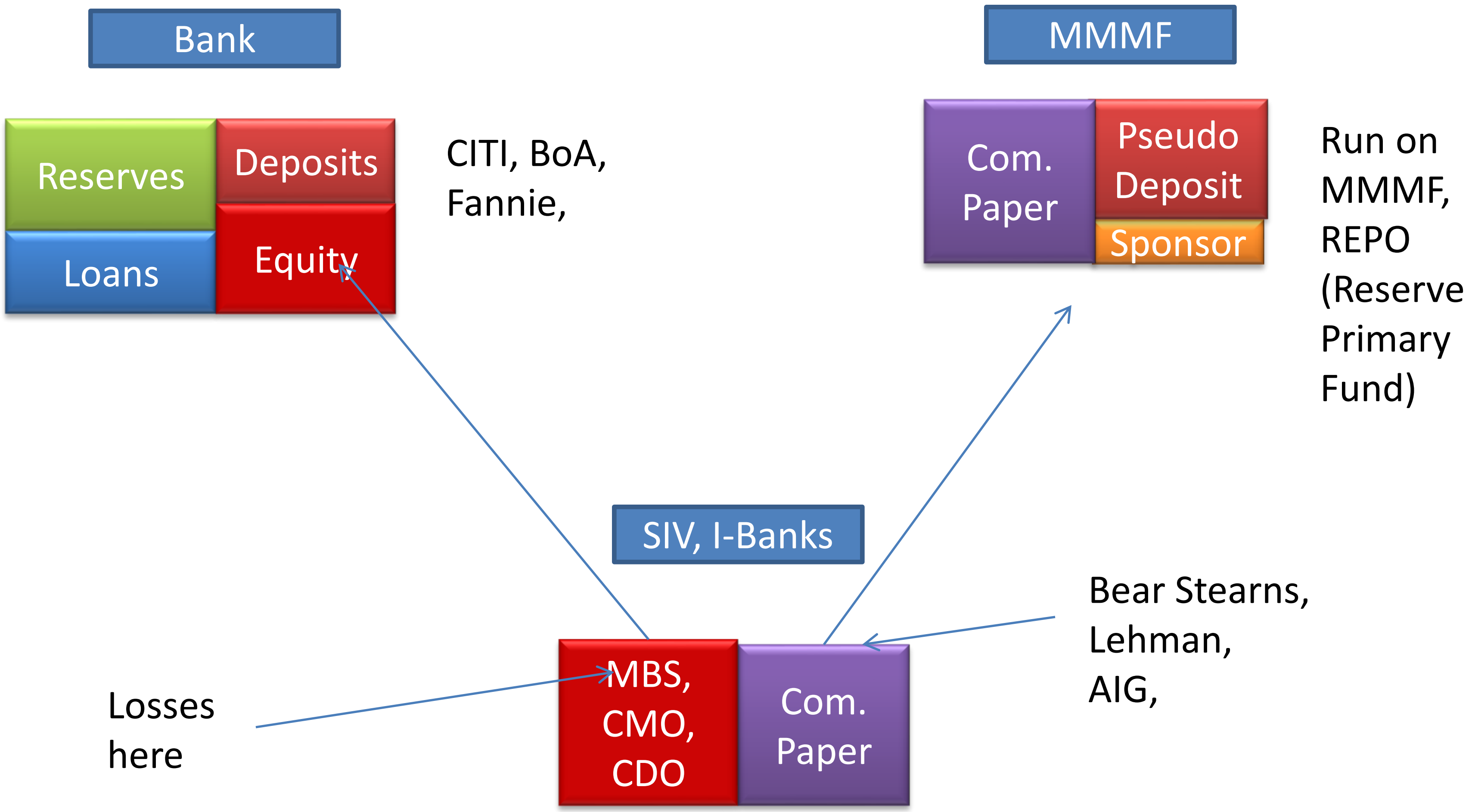
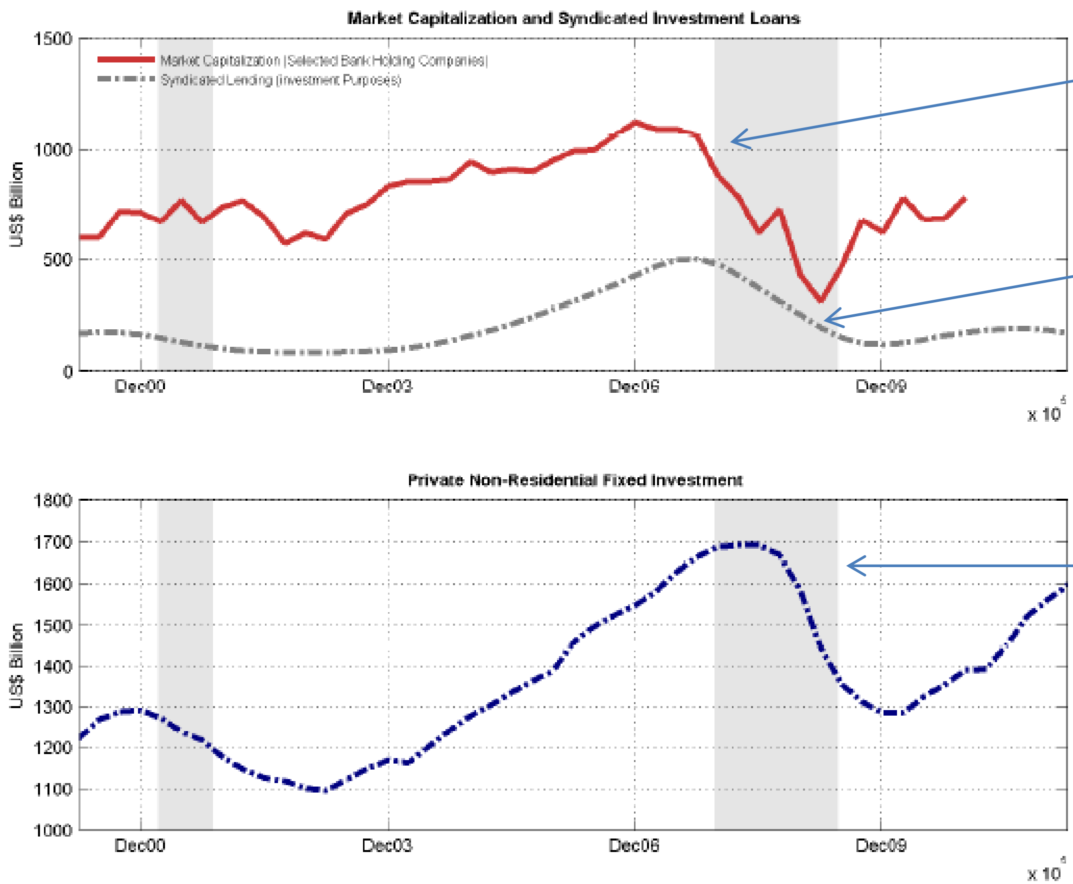


The Crisis Hits



Losses Translated to Less Lending



Bank Market Capitalization

Lending (syndicated Loans)

Real Investment

Figure: Bank Equity