Monetary and Financial Architectures

Fiat Lux – Freshmen Seminar

Prof. Saki Bigio

What is Money?

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

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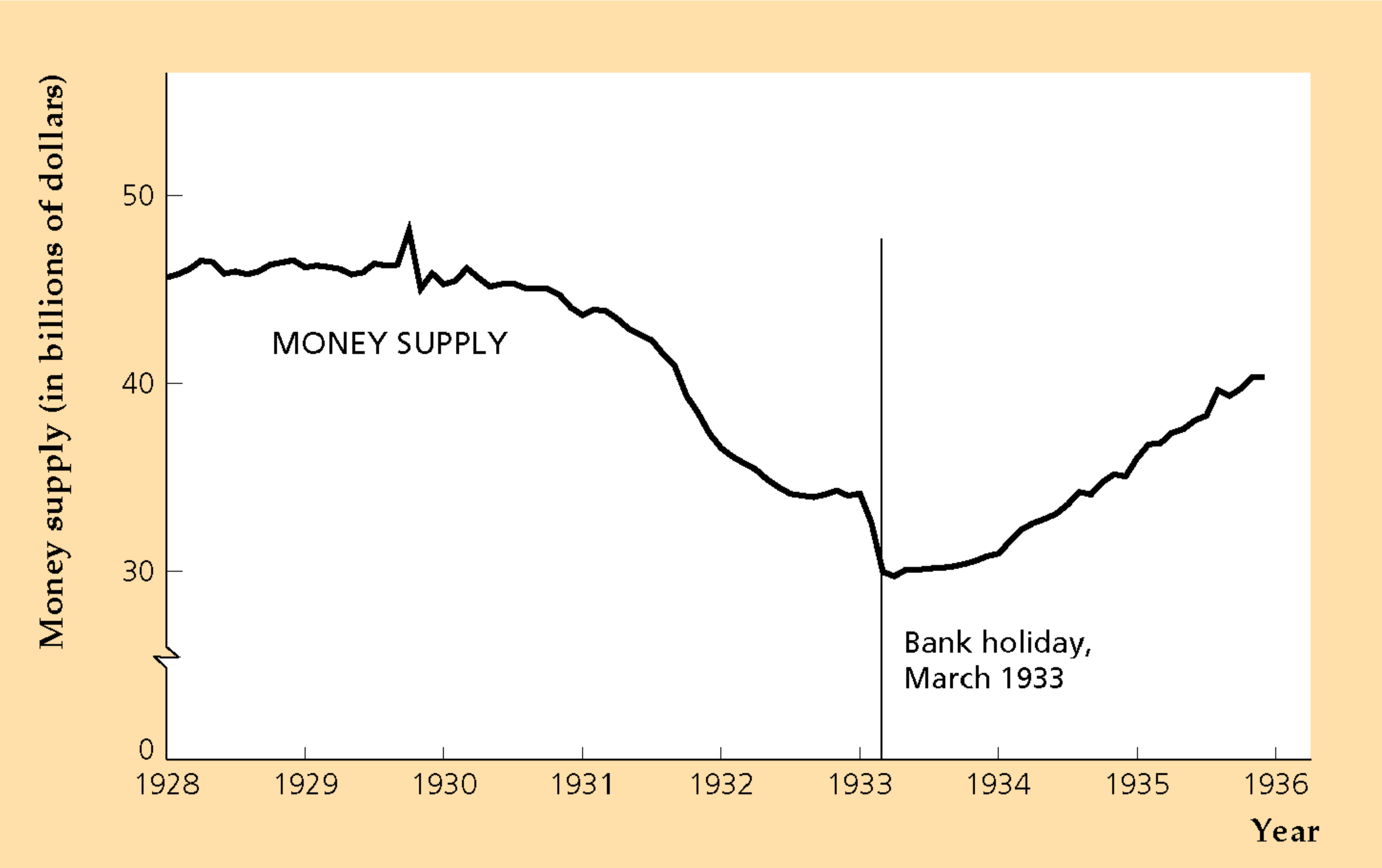
- Store of value



(b) The money supply in the Great Depression

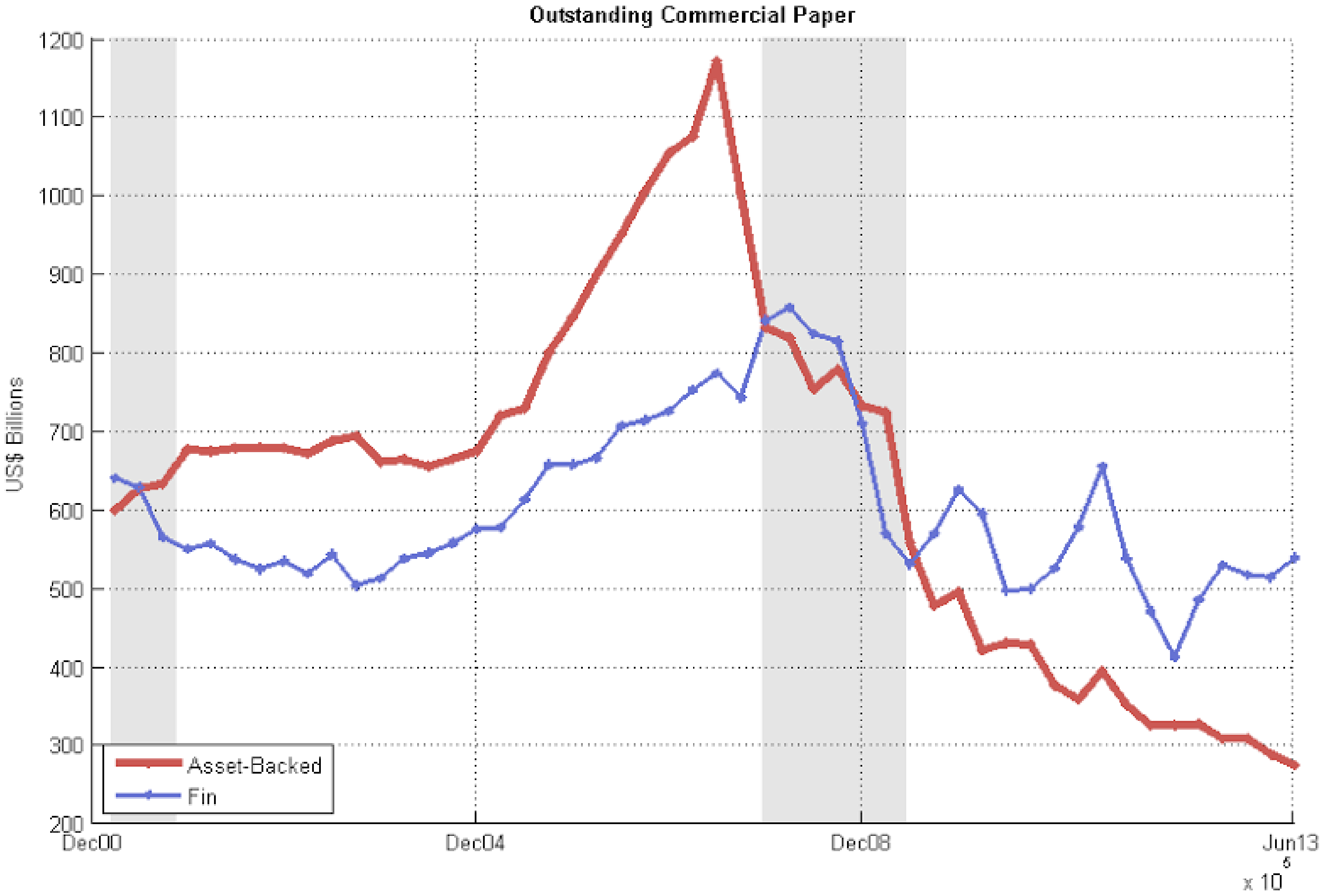
- Friedman Schwartz's ``A Monetary History of the US''
  - Problem because credit unavailable
  - Less exchange

- 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



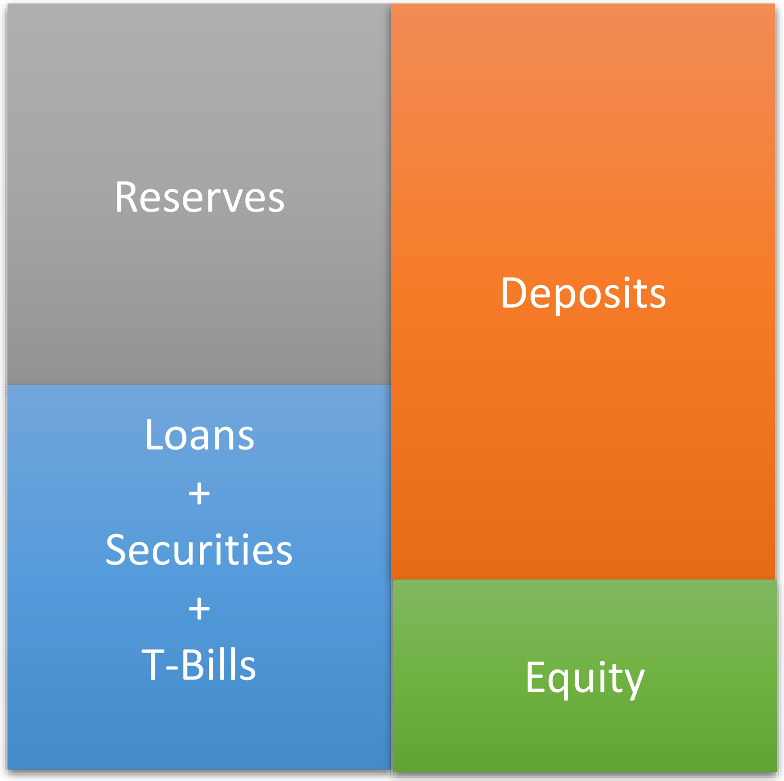
If reduction in Money was Problem, can anyone suggest a Solution?


Prepared for Trendsman.Com by:
BLUEWIRE
http://www.bluewirestudio.com

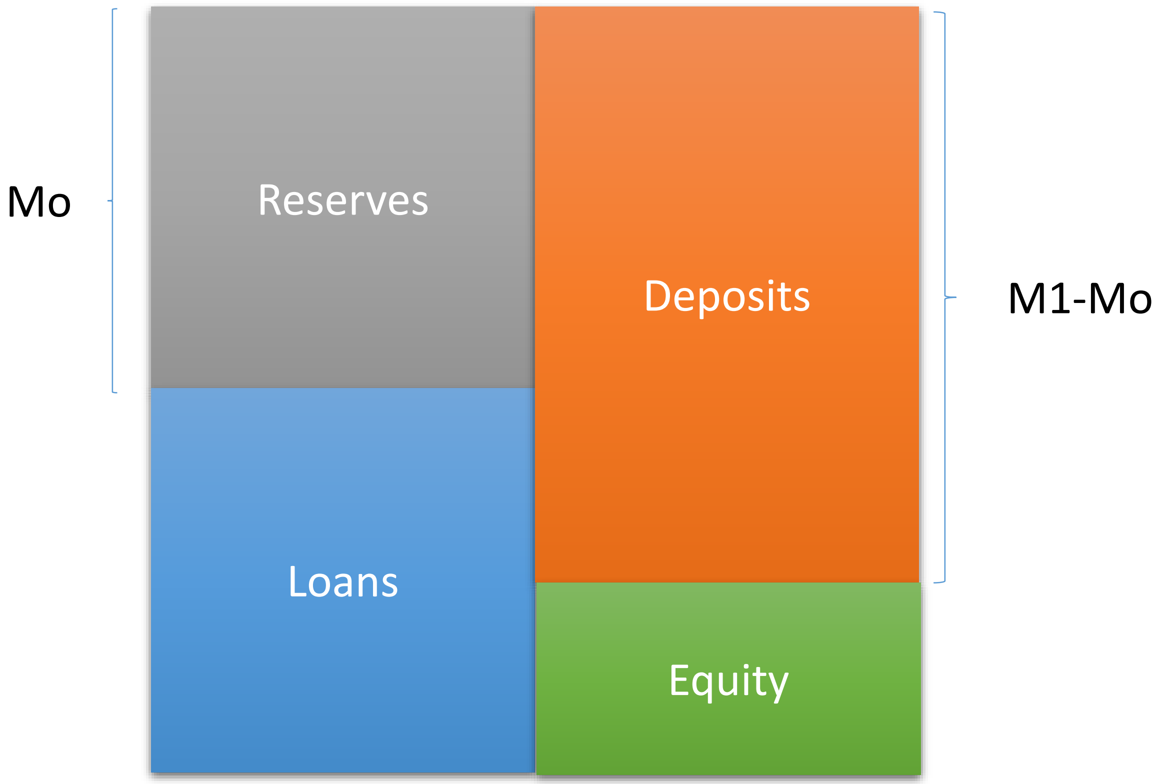
- Thing aren’t as simple…
- Institutional details matter
- There’s no such things as a helicopter drop

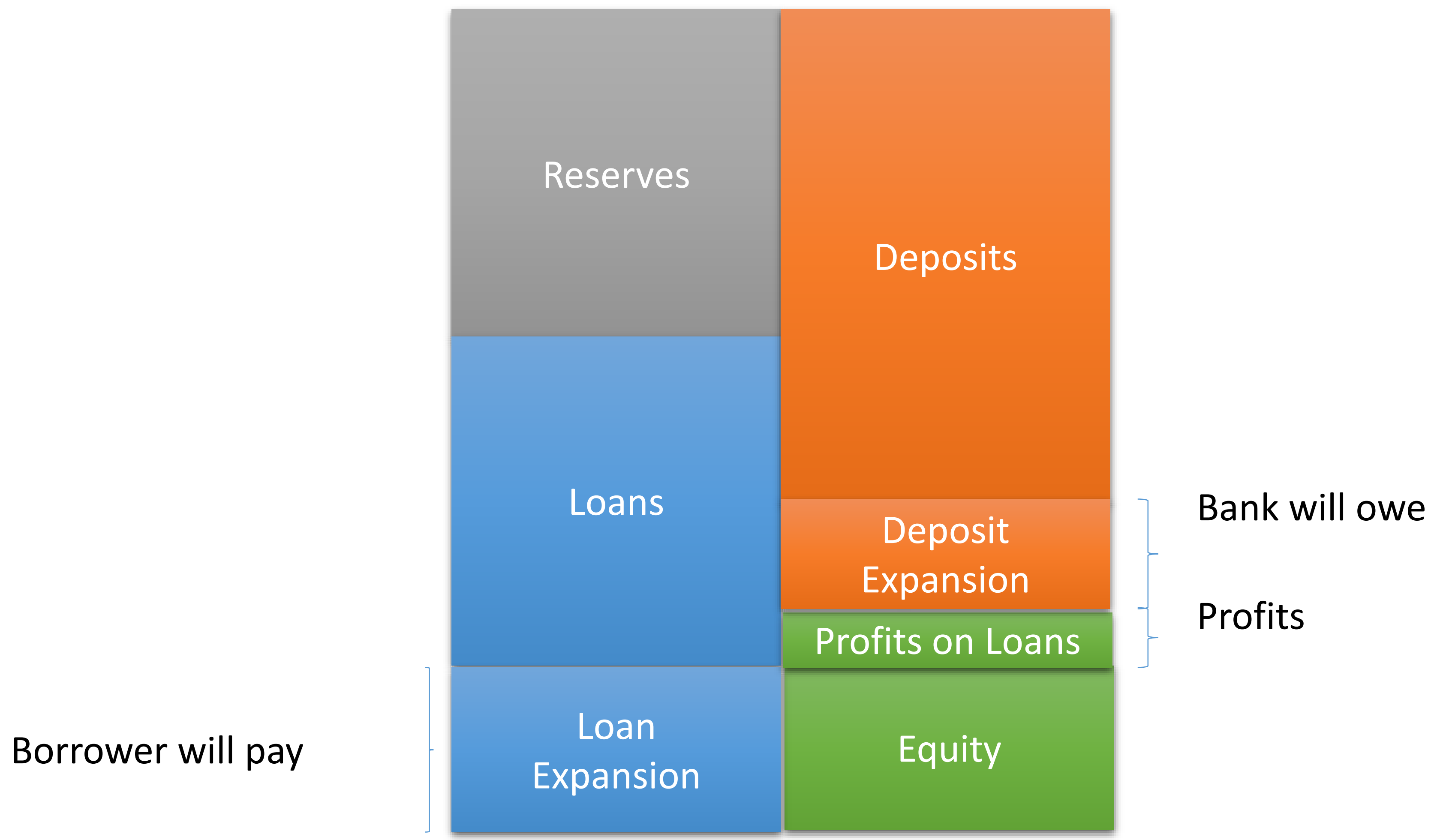
Money Creation by Banks (Money Multiplier)

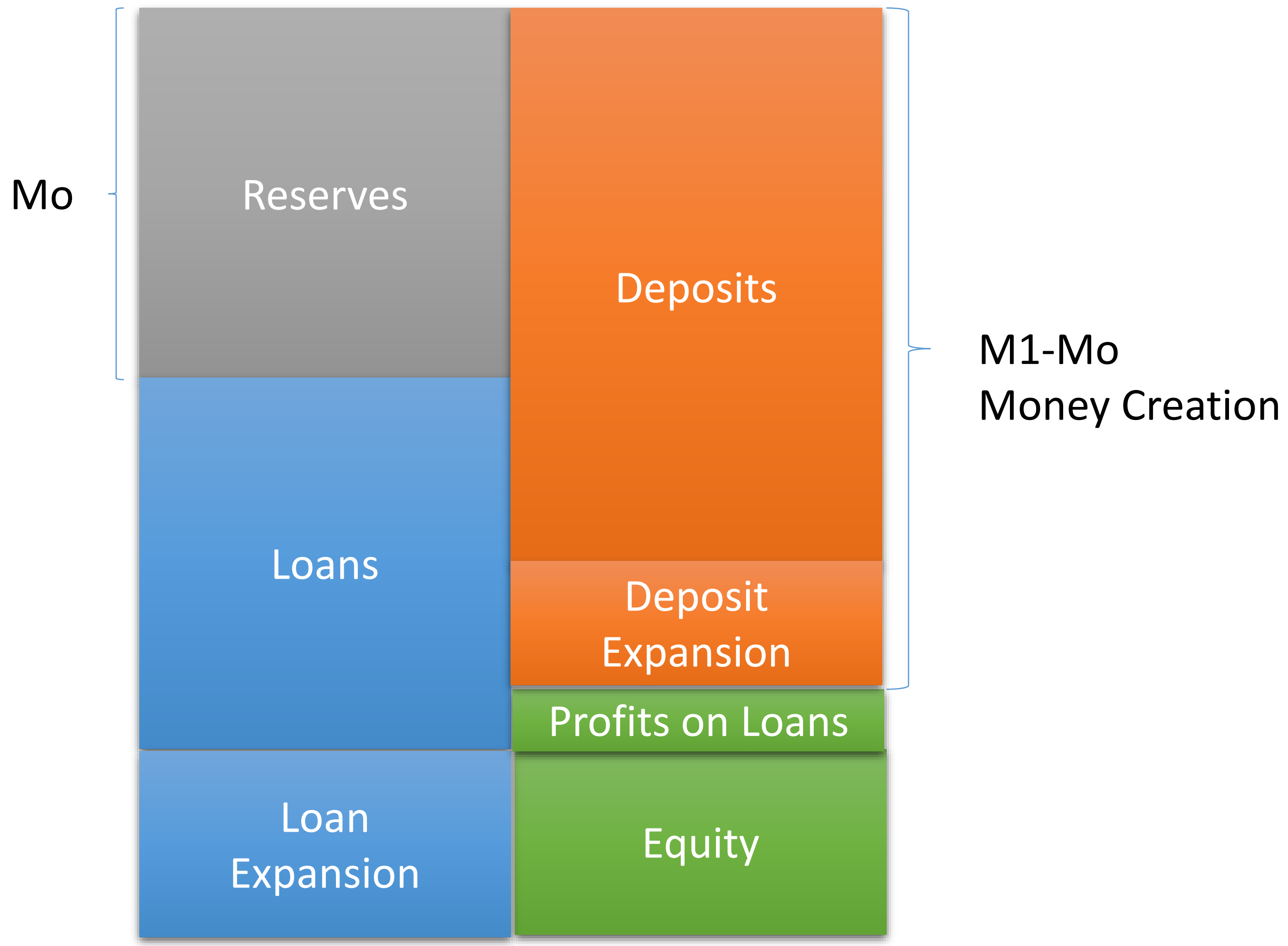
Money Creation
Bank’s Balance Sheet

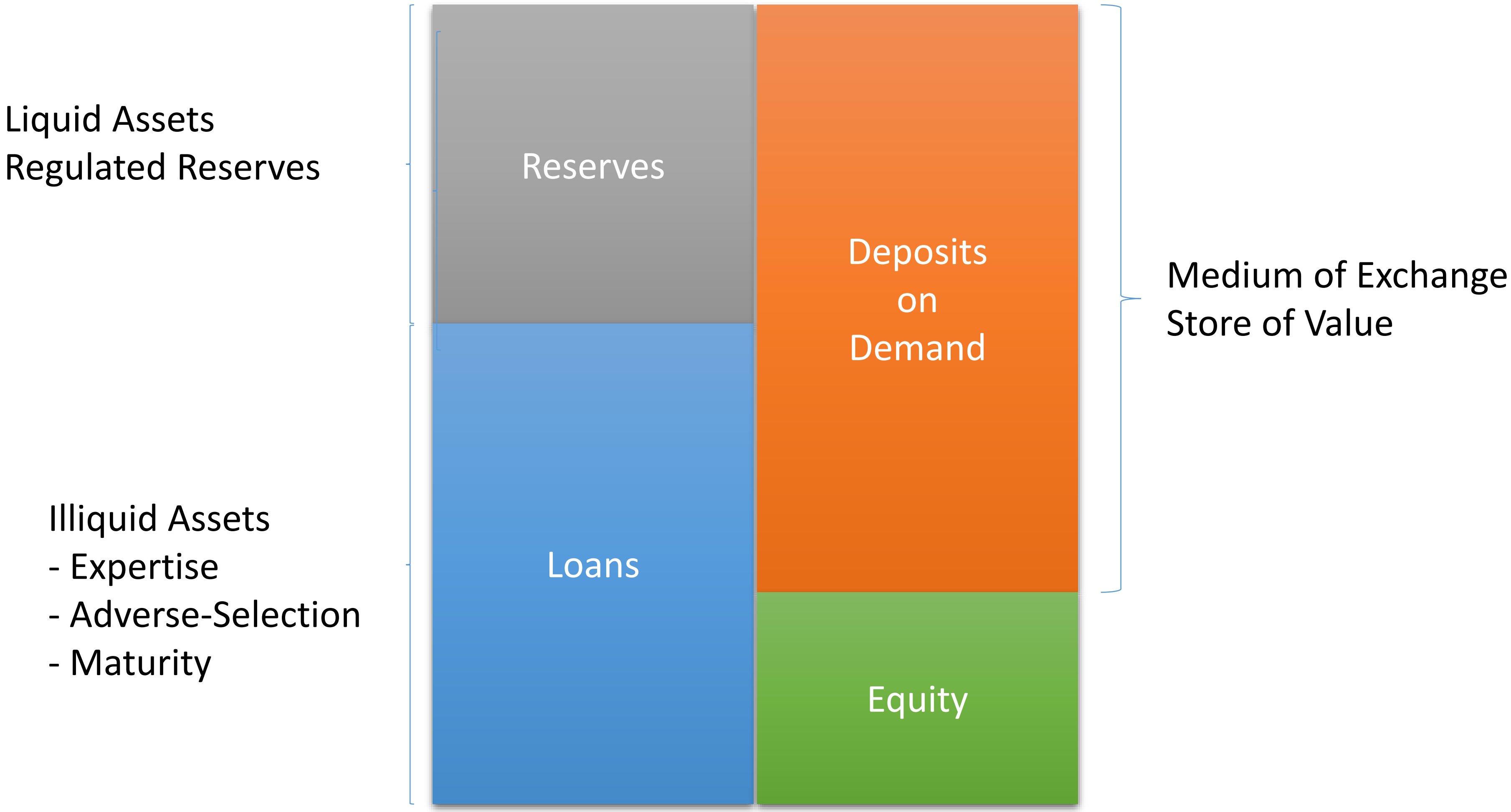

Reserves
Loans
+
Securities
+
T-Bills
Deposits
Equity

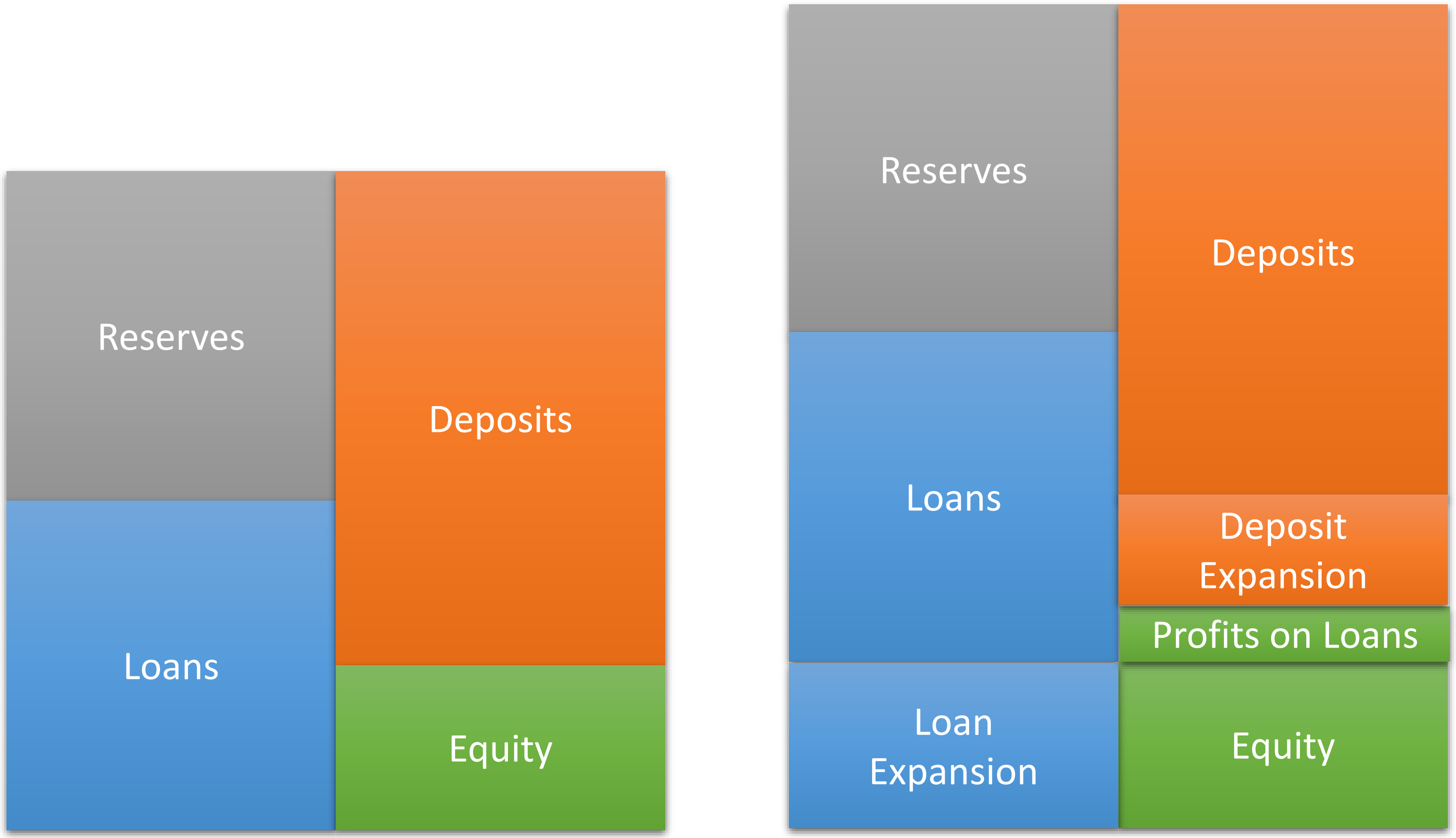
Ratio: M1/M0 is called money multiplier




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


Mo
Reserves
Deposits
M1-Mo
Money Creation
Loans
Deposit
Expansion
Profits on Loans
Loan
Expansion
Equity


Liquid Assets
Regulated Reserves
Illiquid Assets
- Expertise
- Adverse-Selection
- Maturity
Reserves
Loans
Deposits
on
Demand
Equity
Medium of Exchange
Store of Value

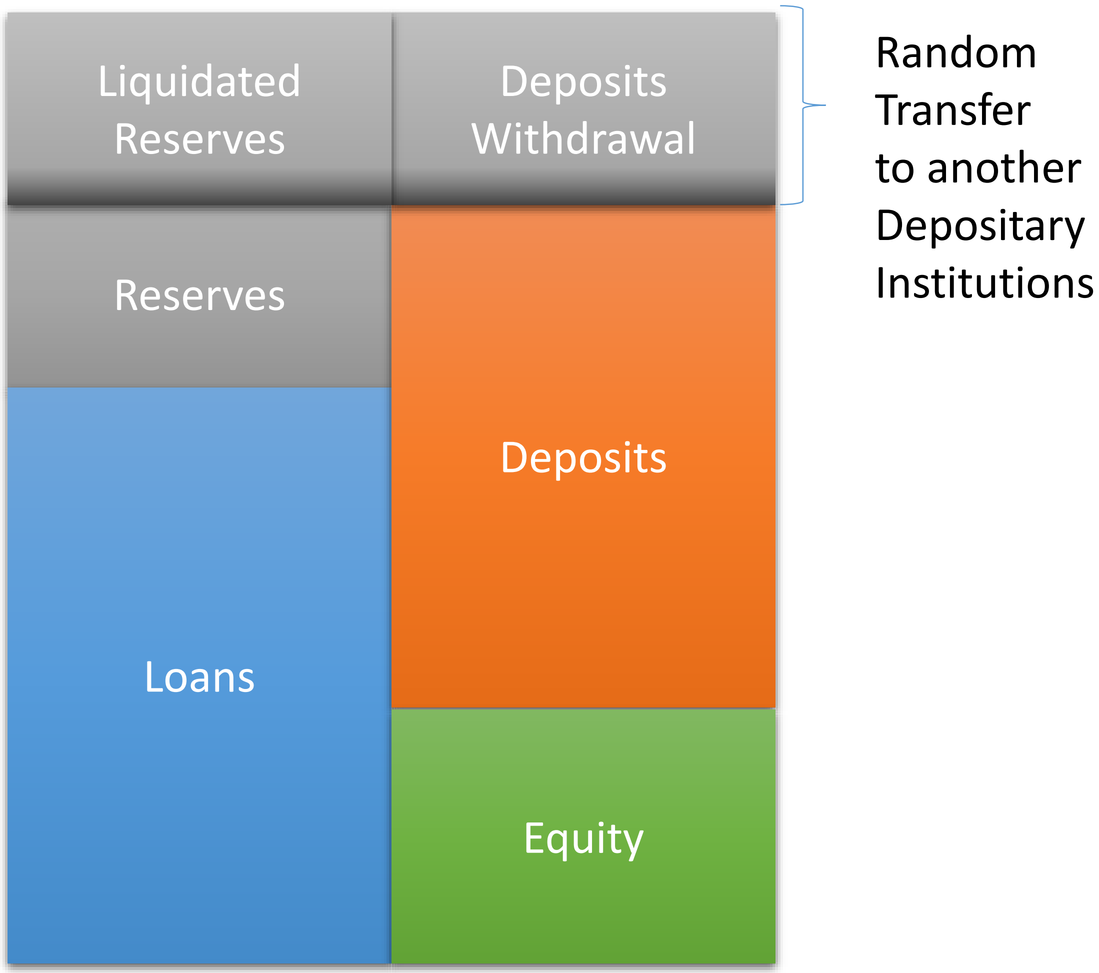

Reserves
Deposits
Loans
Equity
Reserves
Deposits
Loans
Deposit Expansion
Profits on Loans
Loan Expansion
Equity

- Banks make loans issuing liabilities
  - Credit lines or deposits

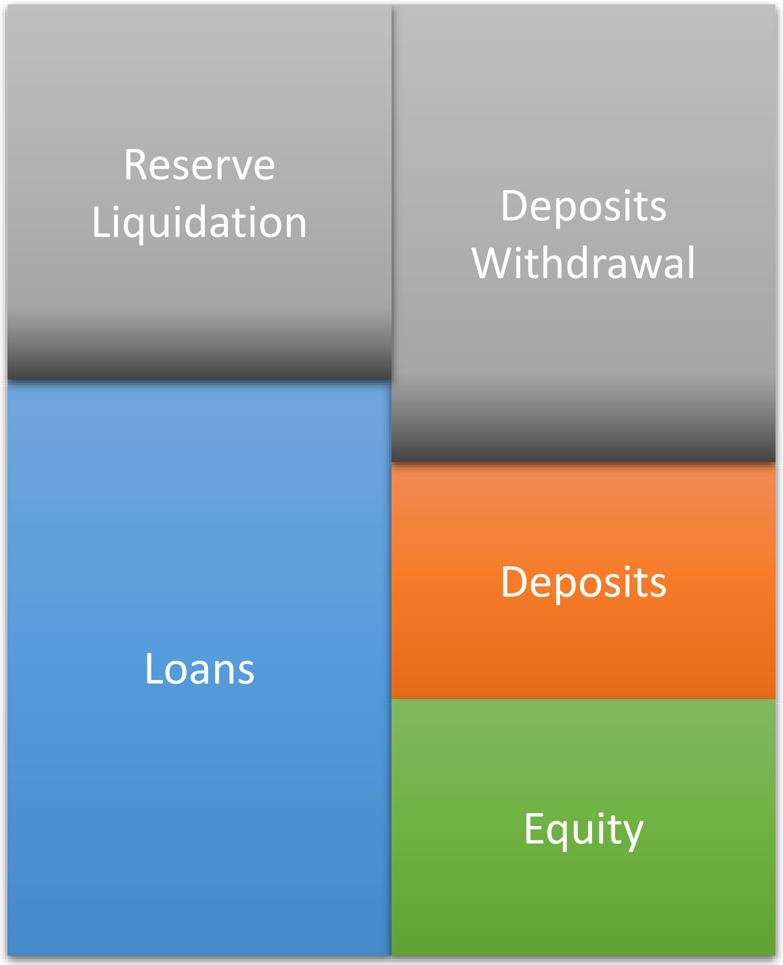
- This process is Monetary Creation

- Given interest differential, they make profits on loans

Withdrawal

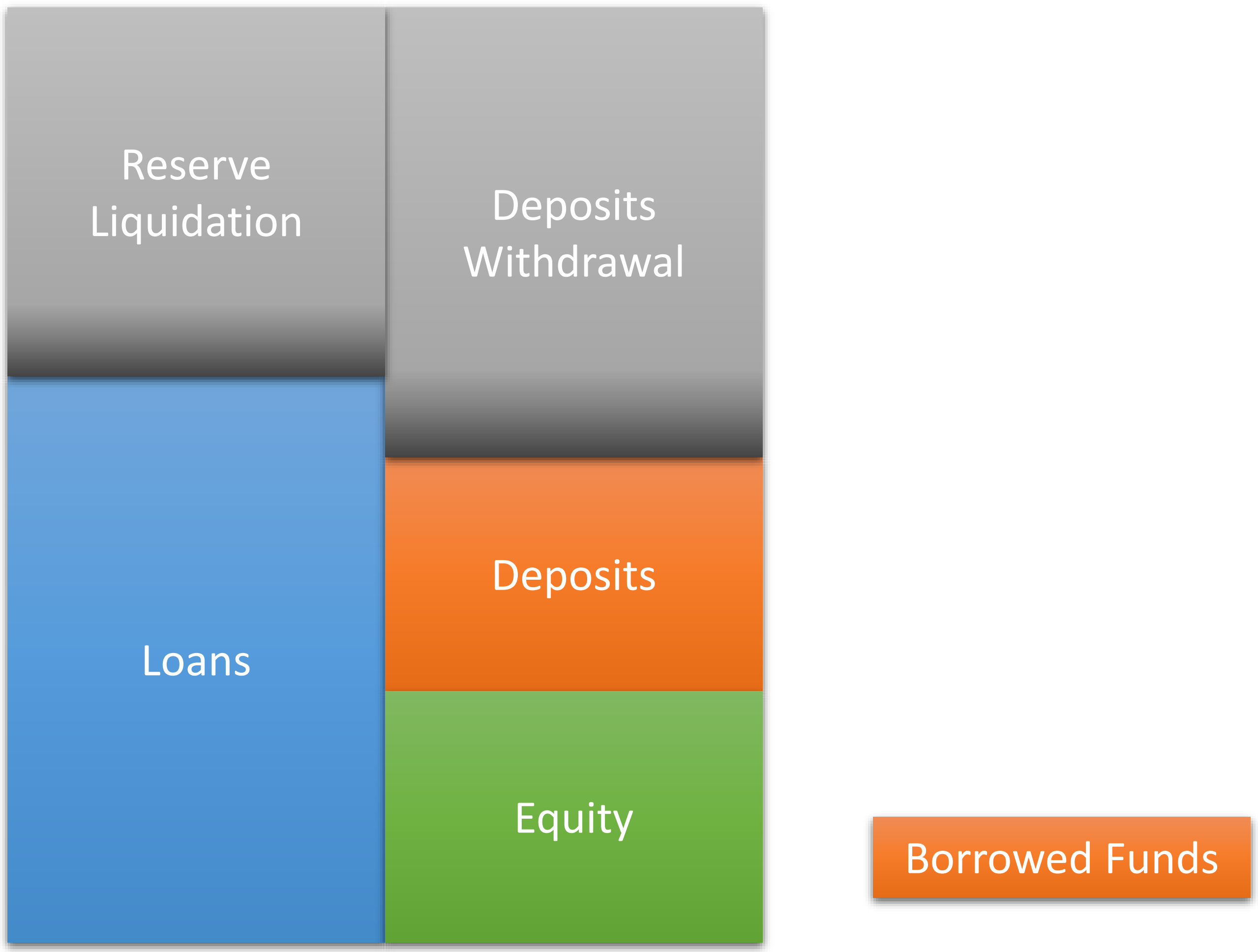

Liquidated Reserves
Deposits Withdrawal
Reserves
Deposits
Loans
Equity
Random Transfer to another Depositary Institutions

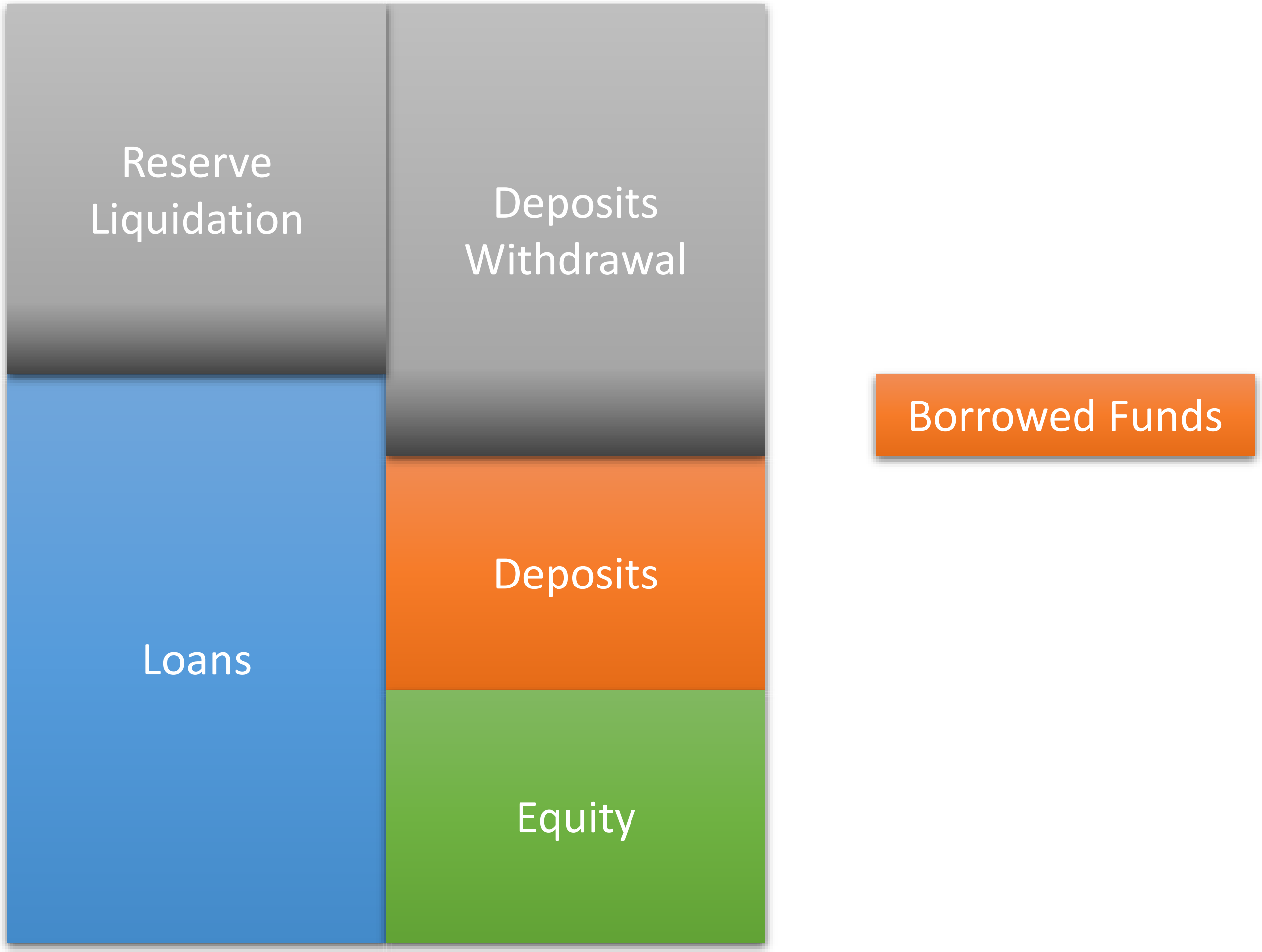
Liquidity Risk
(Withdrawal Risk)

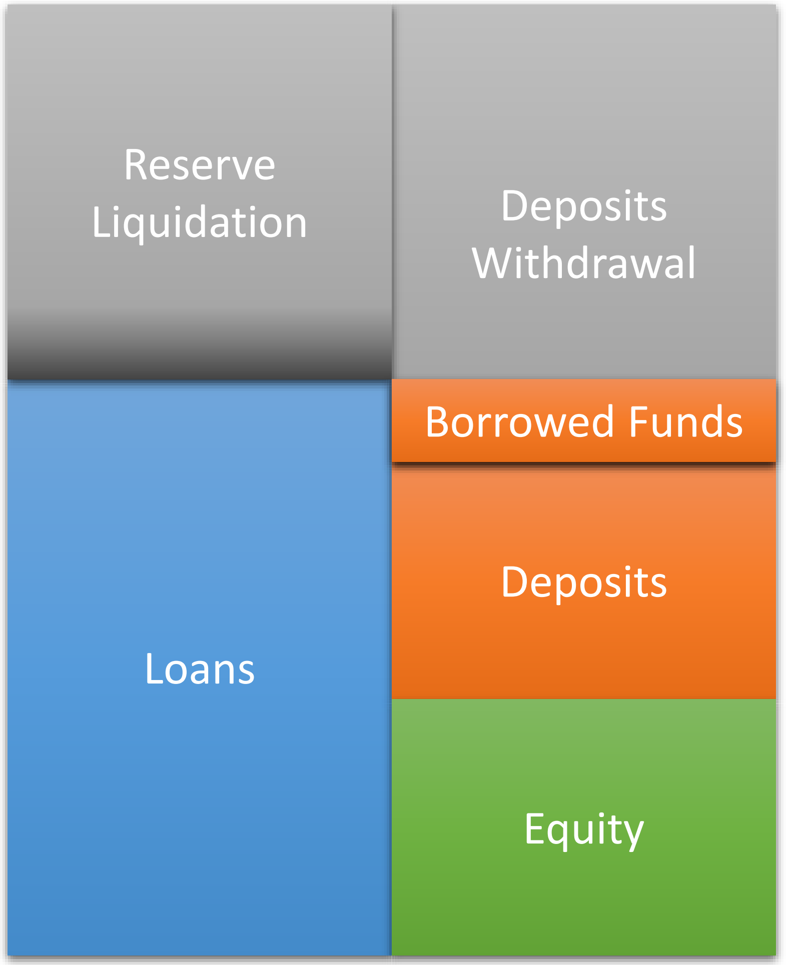


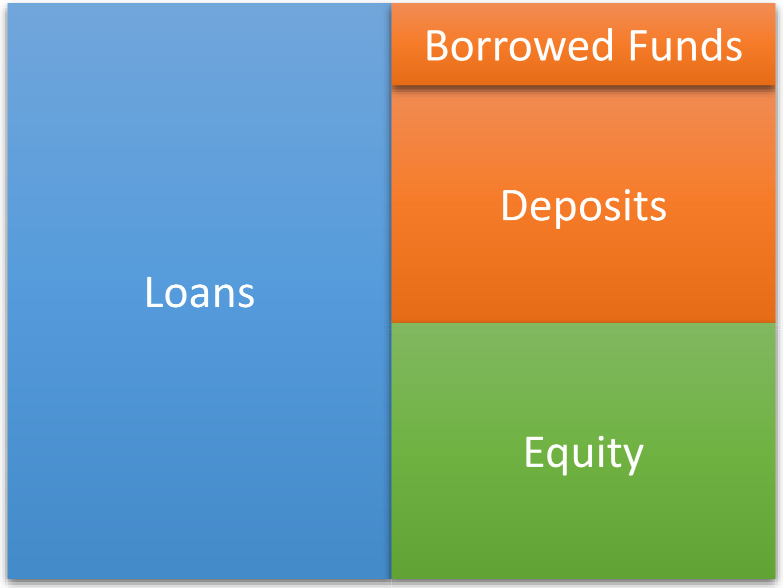
Withdrawal in excess of existing Reserves

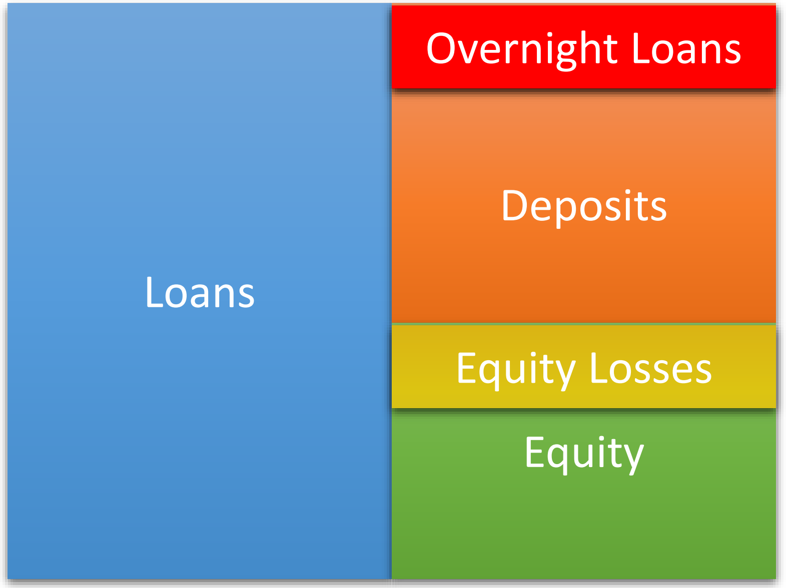
Interbank Market


Reserve Liquidation
Deposits Withdrawal
Loans
Deposits
Equity
Borrowed Funds

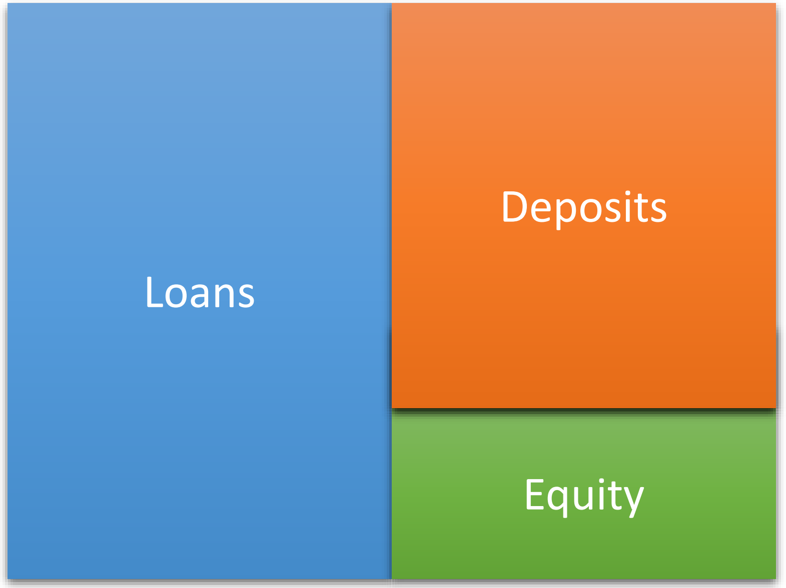

Reserve Liquidation
Deposits Withdrawal
Borrowed Funds
Deposits
Loans
Equity

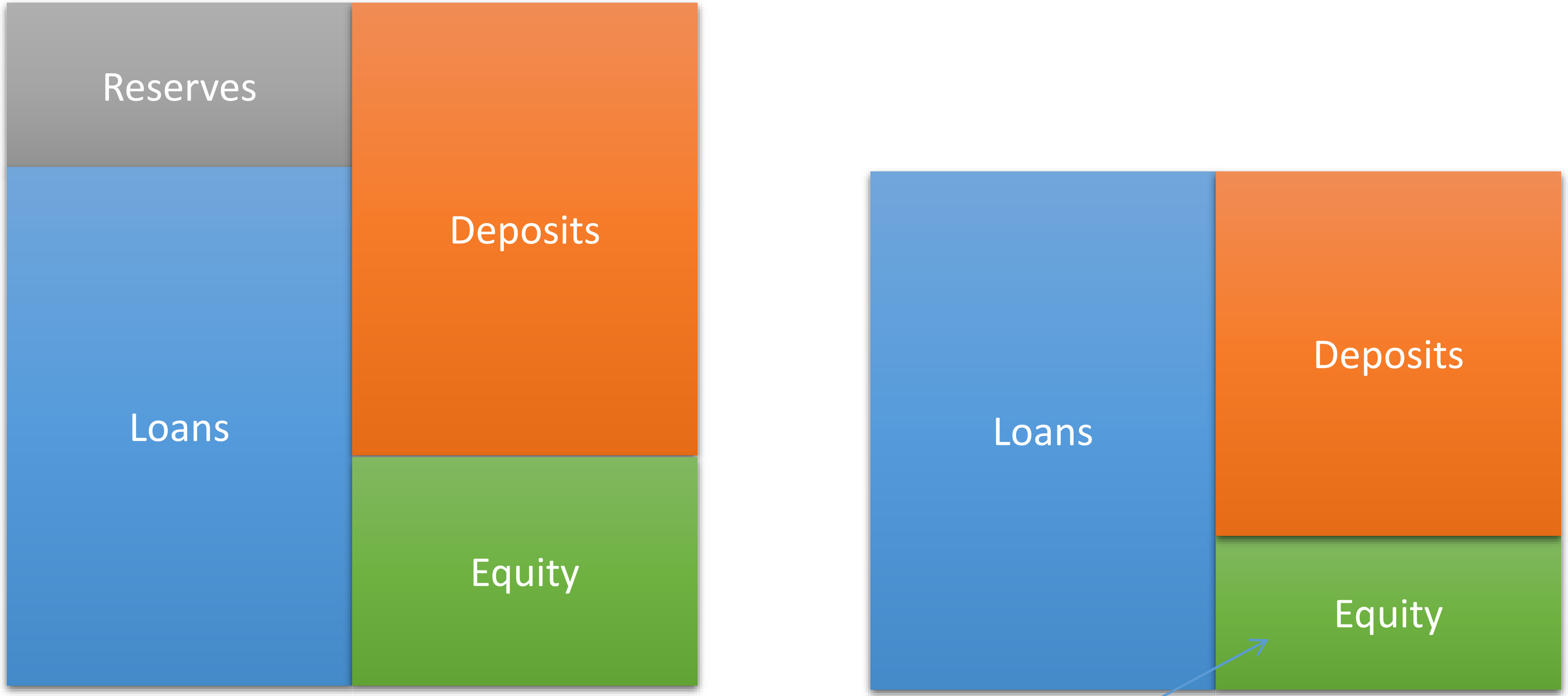

Reserve Liquidation
Deposits Withdrawal
Borrowed Funds
Loans
Deposits
Equity


Borrowed Funds
Deposits
Loans
Equity



Loans
Overnight Loans
Deposits
Equity Losses
Equity


Loans
Deposits
Equity



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

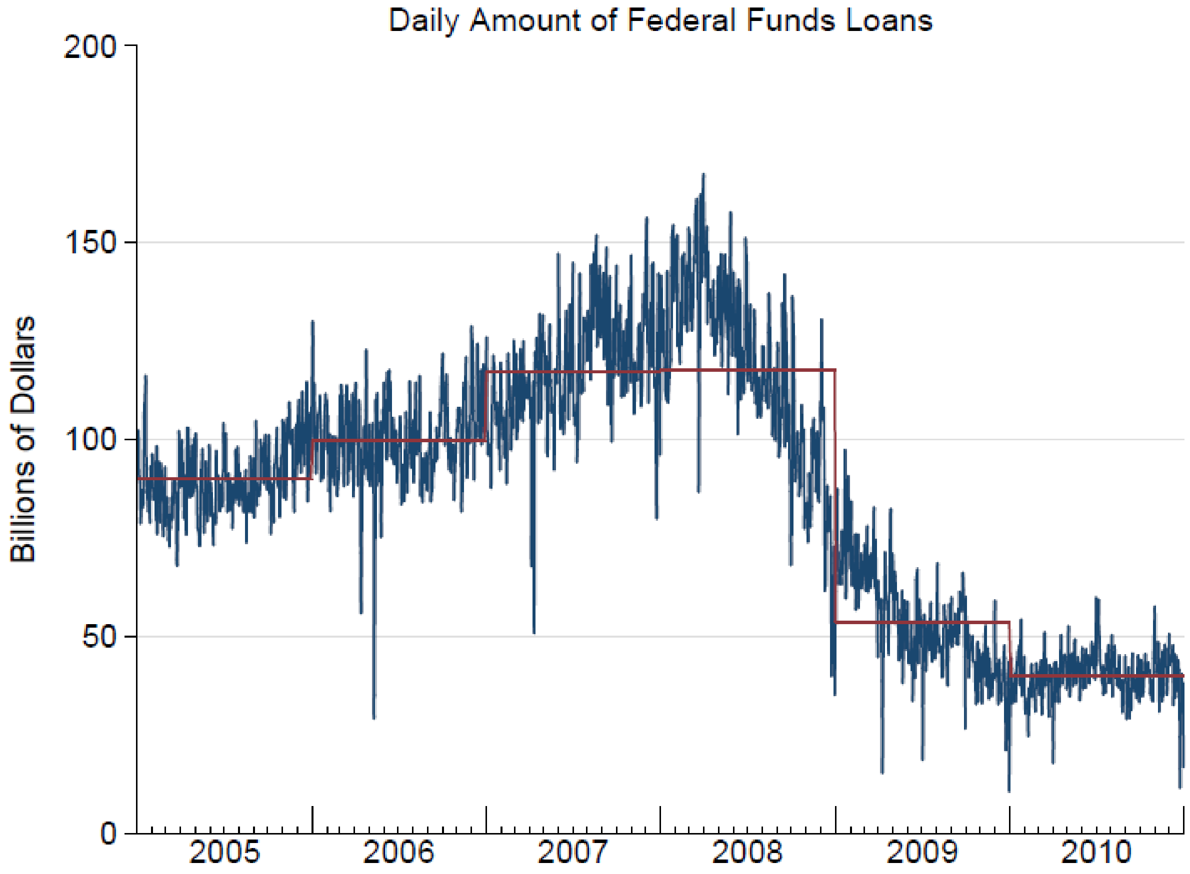
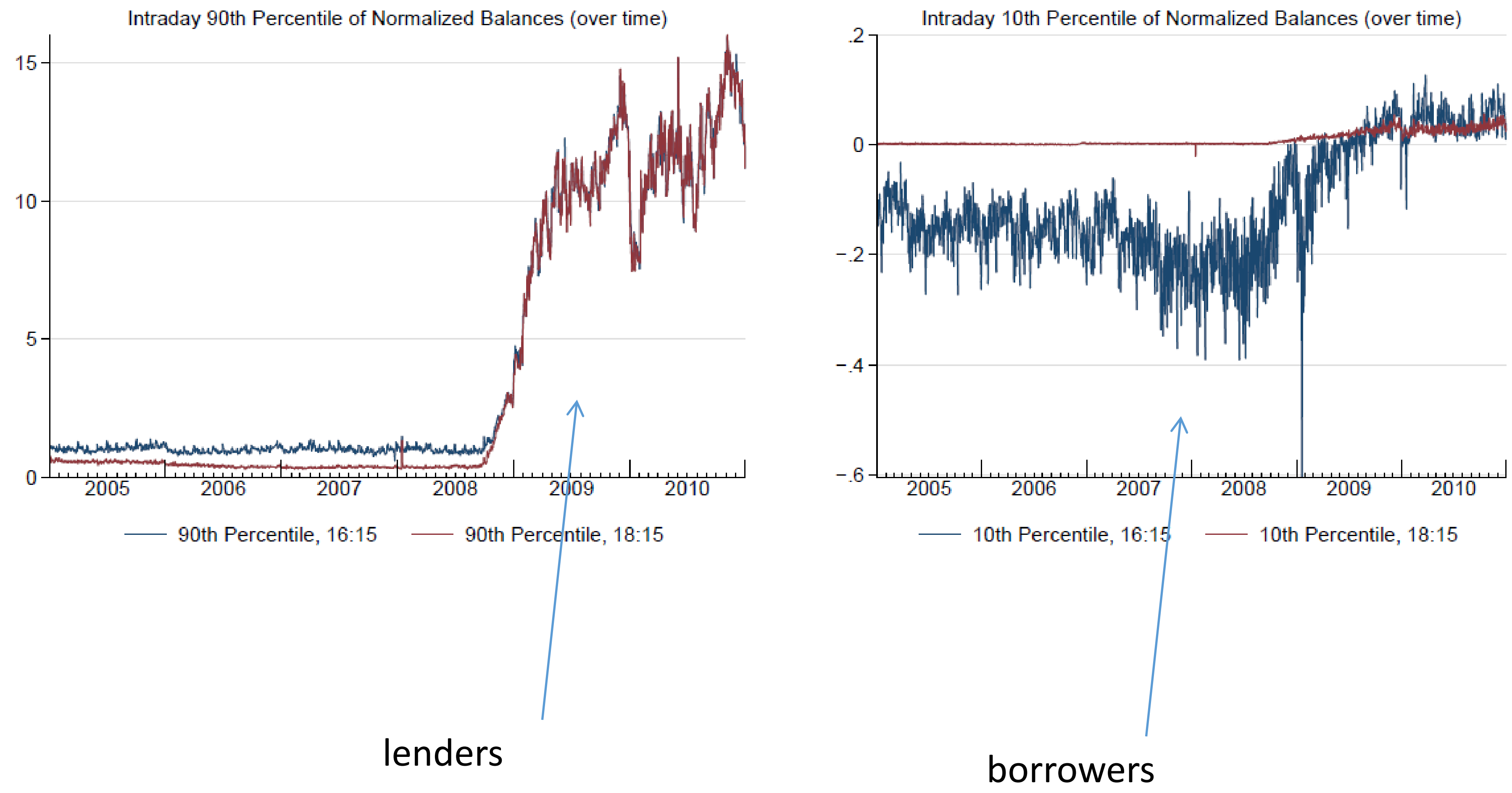


Figure 4: Daily trade volume


Intraday 90th Percentile of Normalized Balances (over time)
15
10
5
0
2005
2006
2007
2008
2009
2010
90th Percentile, 16:15
90th Percentile, 18:15
Intraday 10th Percentile of Normalized Balances (over time)
.2
0
−.2
−.4
−.6
2005
2006
2007
2008
2009
2010
10th Percentile, 16:15
10th Percentile, 18:15
lenders
borrowers

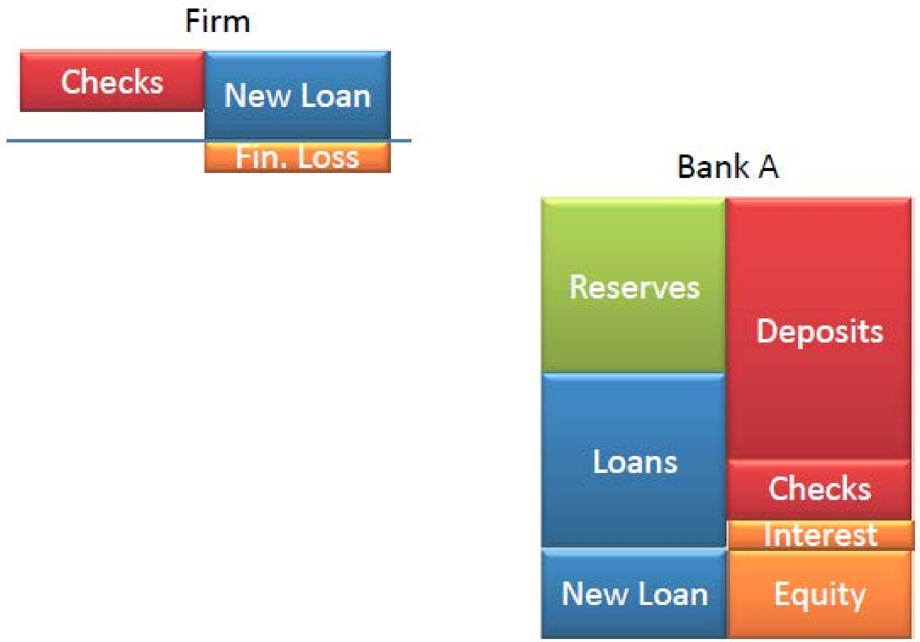
- Deposits are “callable-on-demand”

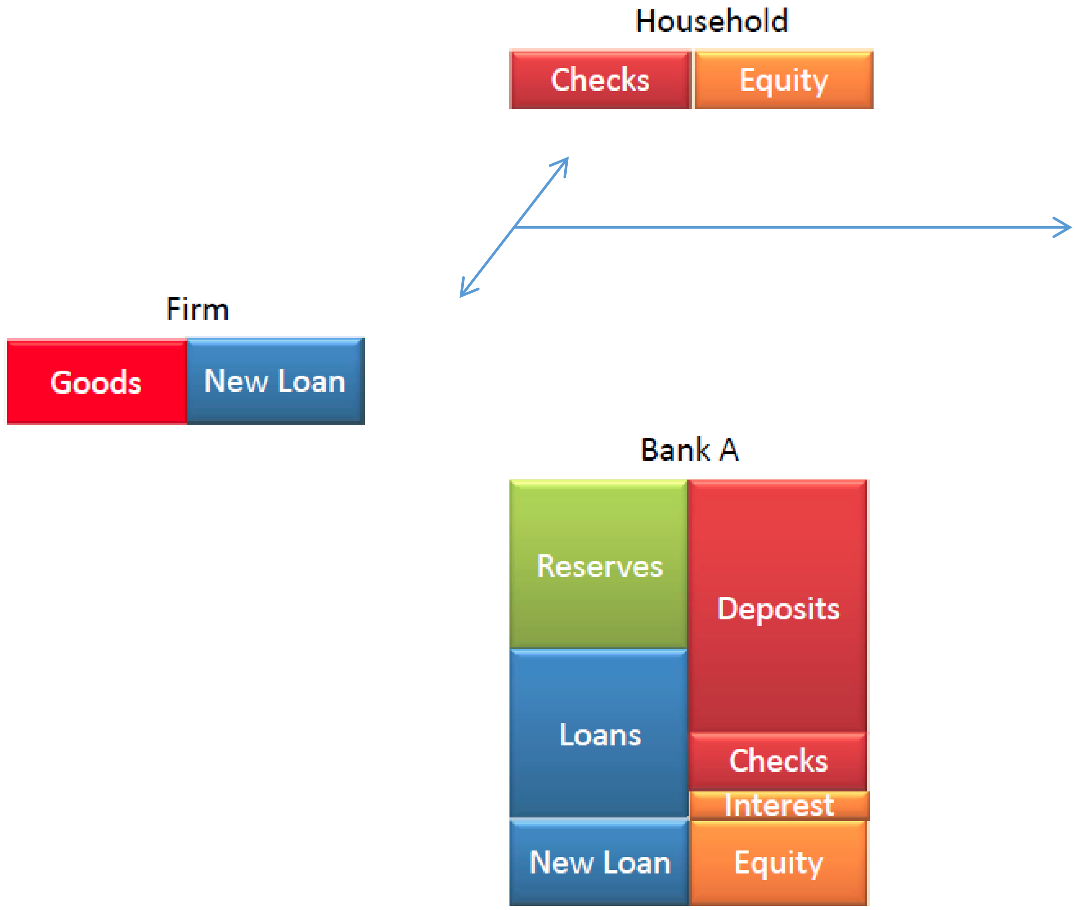
- They mover rapidly from one institution to another

- 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

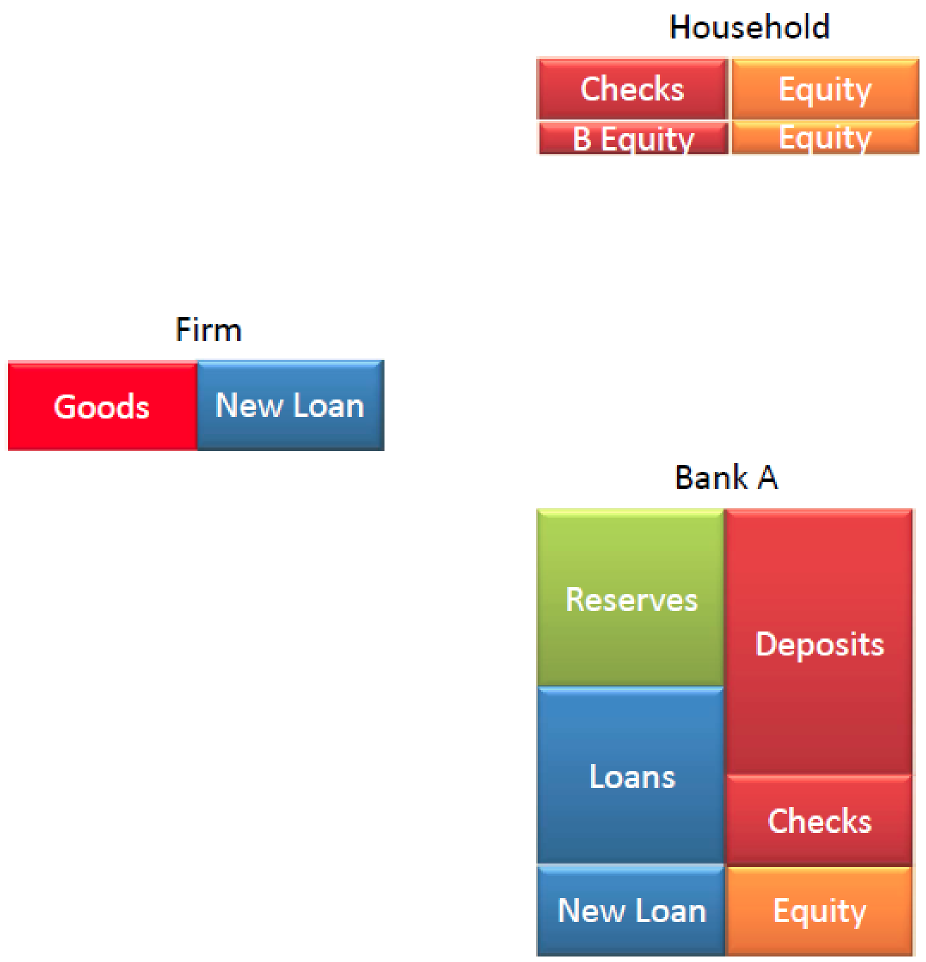
- Credit is fundamental for the workings of the economy
- Without credit, trade cannot occur!

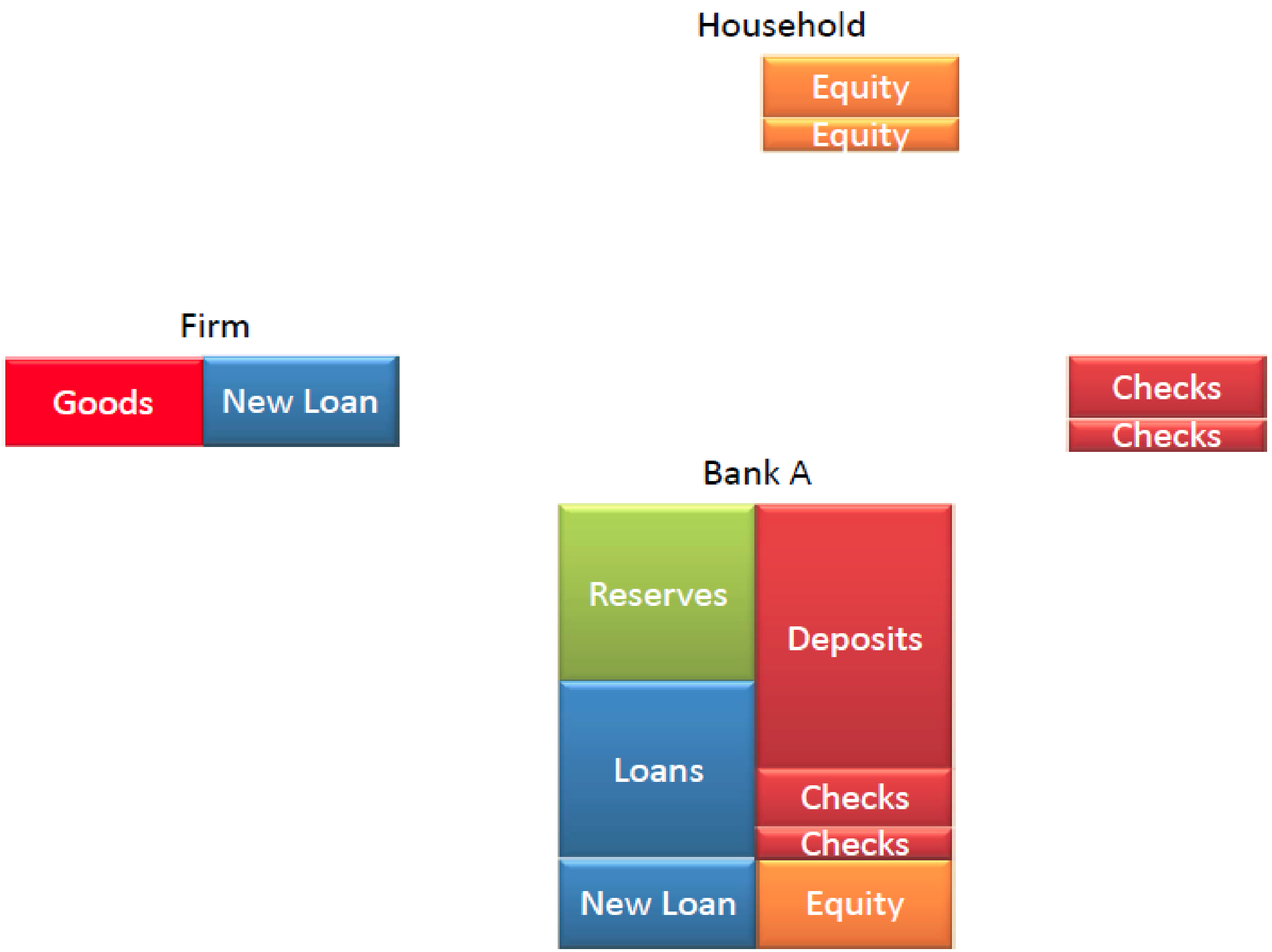
Bank A

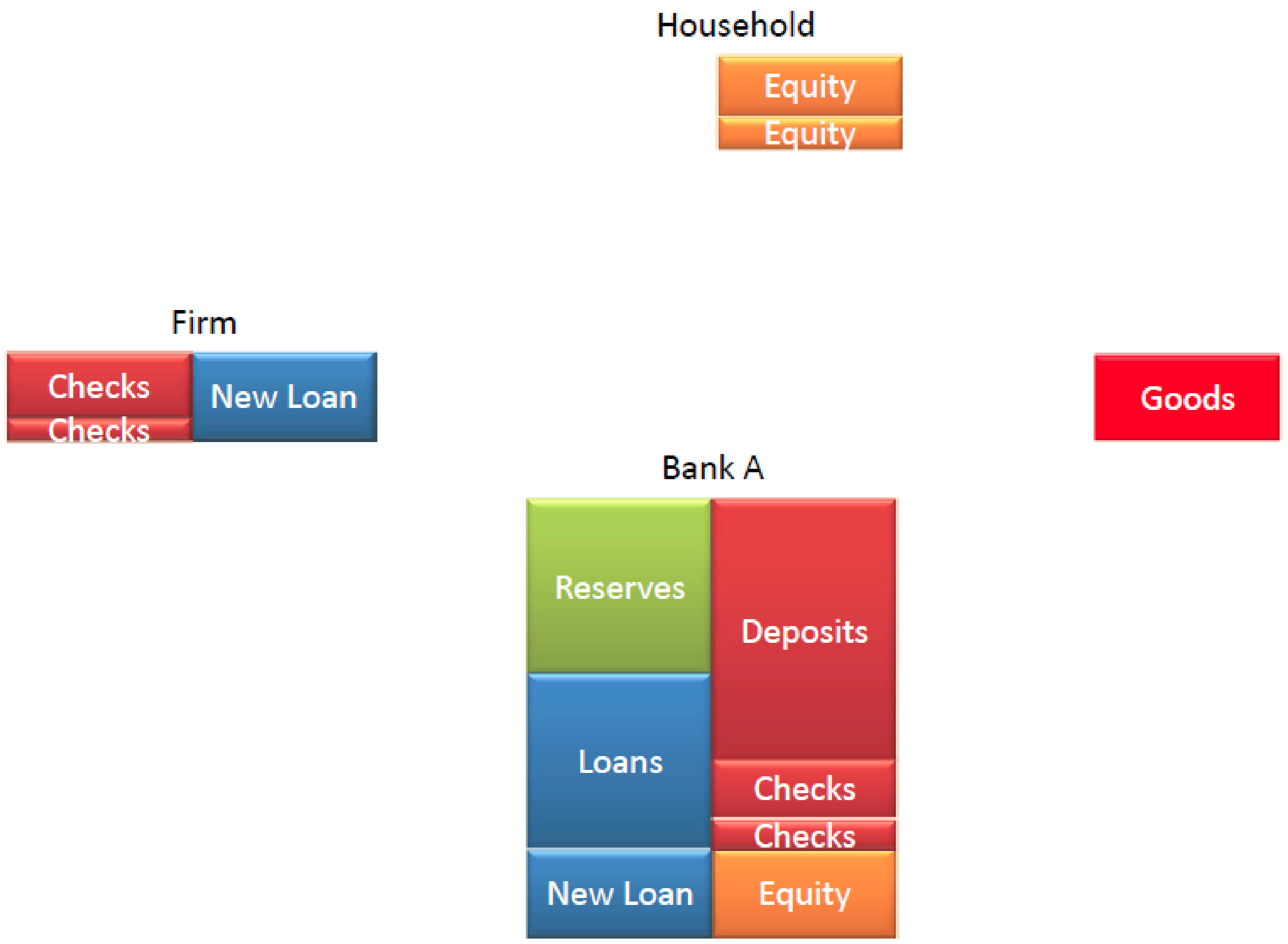

Firm
Checks
New Loan
Fin. Loss
Bank A
Reserves
Deposits
Loans
Checks
Interest
New Loan
Equity

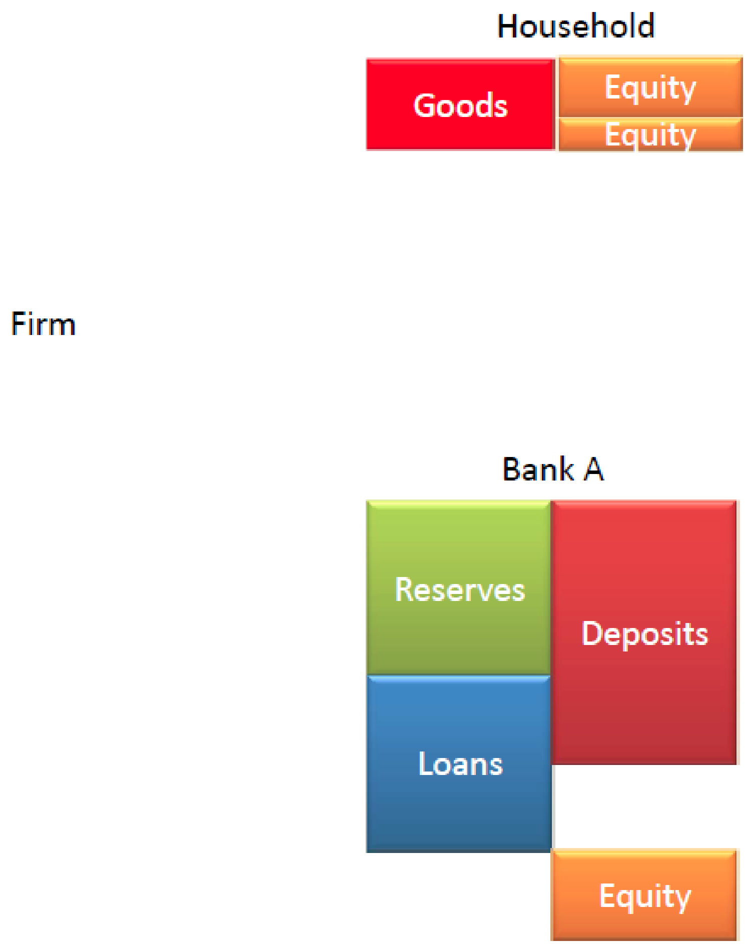


Firms hire
Workers by using credit
lines


Household
Checks
Equity
B Equity
Equity
Firm
Goods
New Loan
Bank A
Reserves
Deposits
Loans
Checks
New Loan
Equity


Household
Equity
Equity
Firm
Goods
New Loan
Checks
Checks
Bank A
Reserves
Deposits
Loans
Checks
Checks
New Loan
Equity


Household
Equity
Equity
Firm
Checks
Checks
New Loan
Goods
Bank A
Reserves
Deposits
Loans
Checks
Checks
New Loan
Equity


Household
Goods
Equity
Equity
Firm
Bank A
Reserves
Deposits
Loans
Equity

Household

Firm

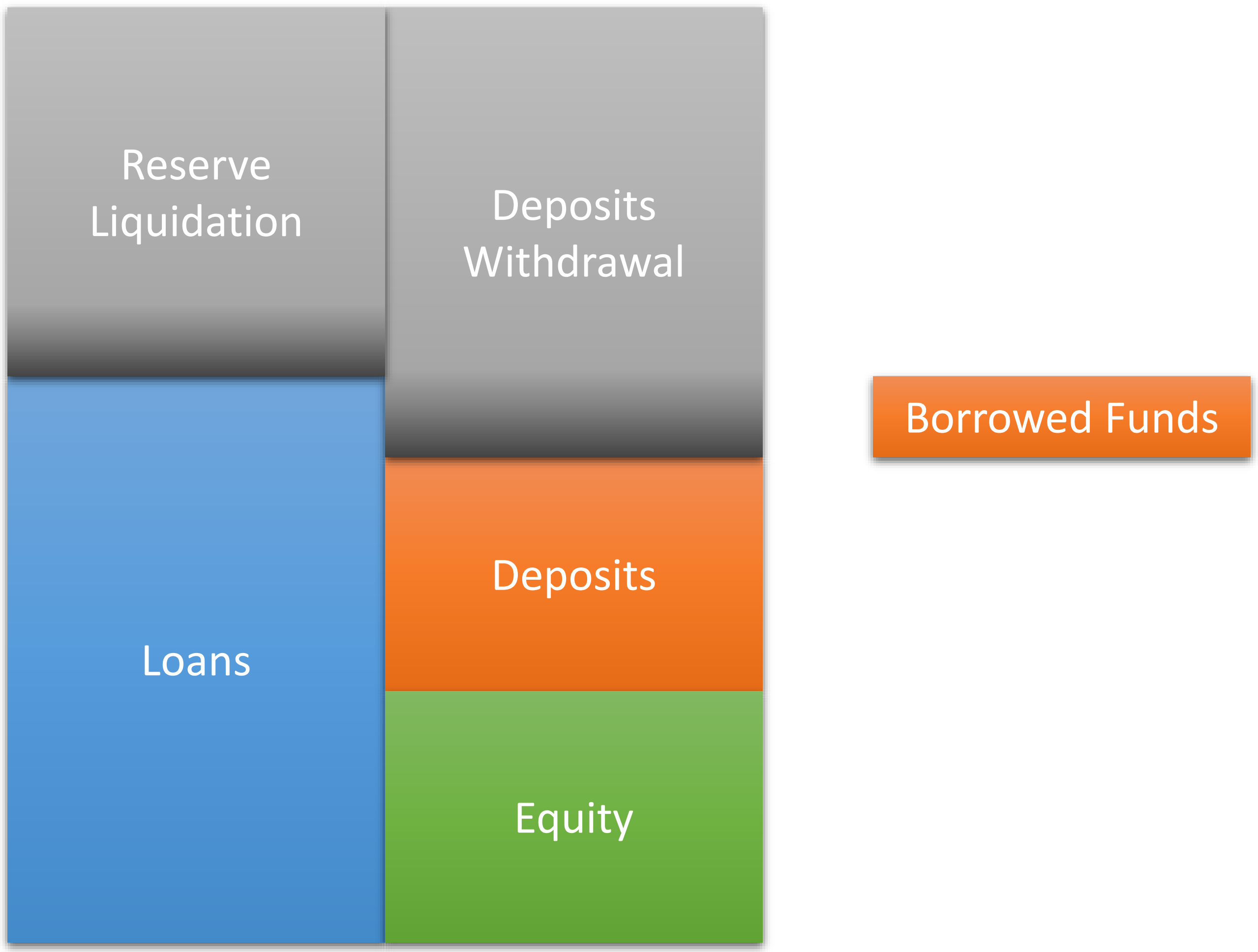
Bank A

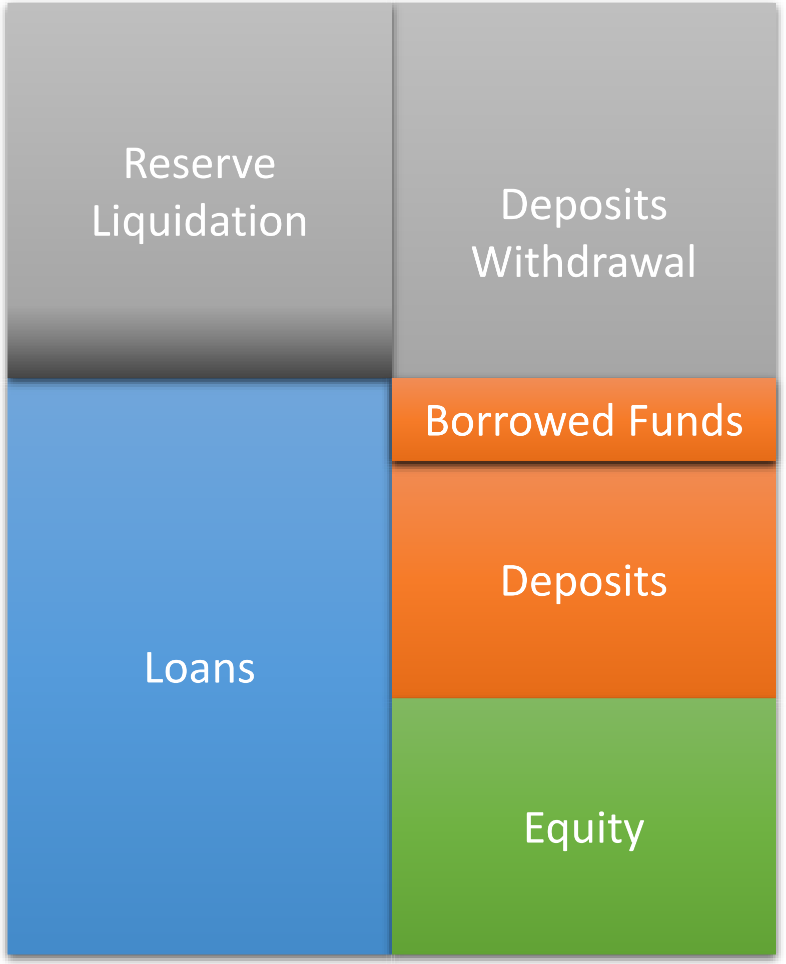
Monetary Policy Tools

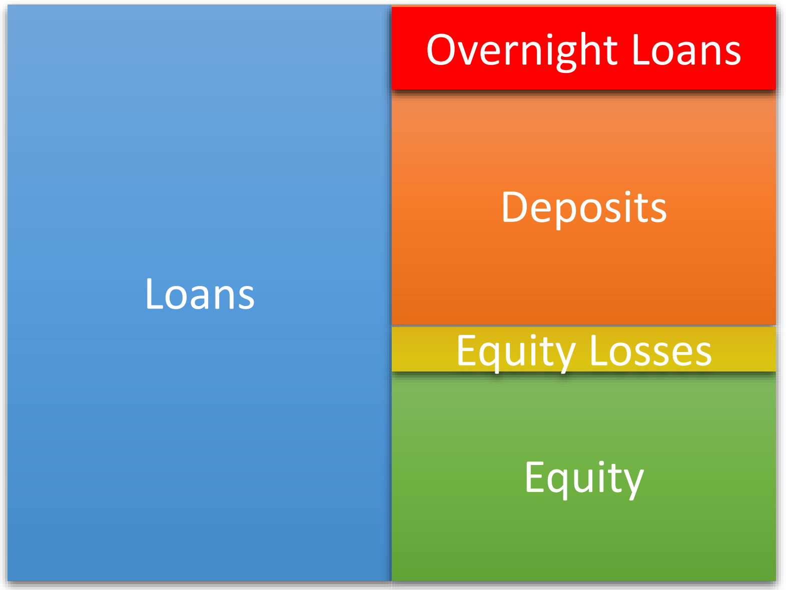
- Typically 3
    - Reserve Requirements
    - Open Market Operations
    - Discount Window

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

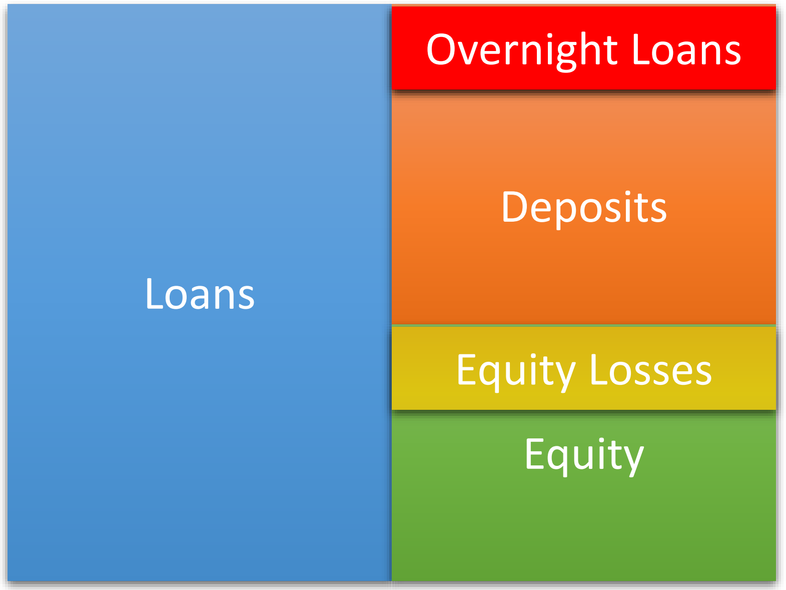
Discount Window


Reserve Liquidation
Deposits Withdrawal
Borrowed Funds
Loans
Deposits
Equity


Reserve Liquidation
Deposits Withdrawal
Borrowed Funds
Deposits
Loans
Equity



Lower Overnight Rate

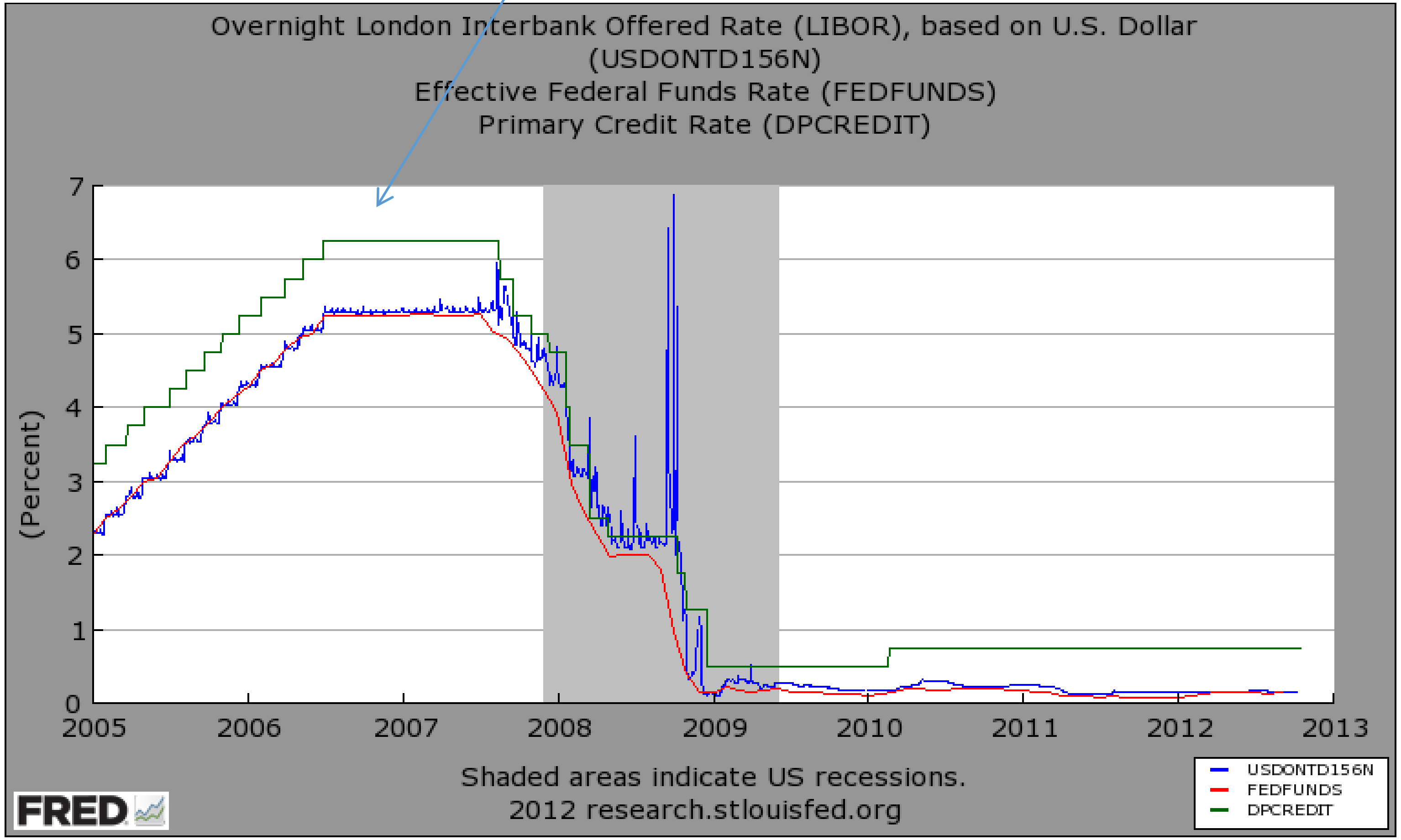


Without FED OMO

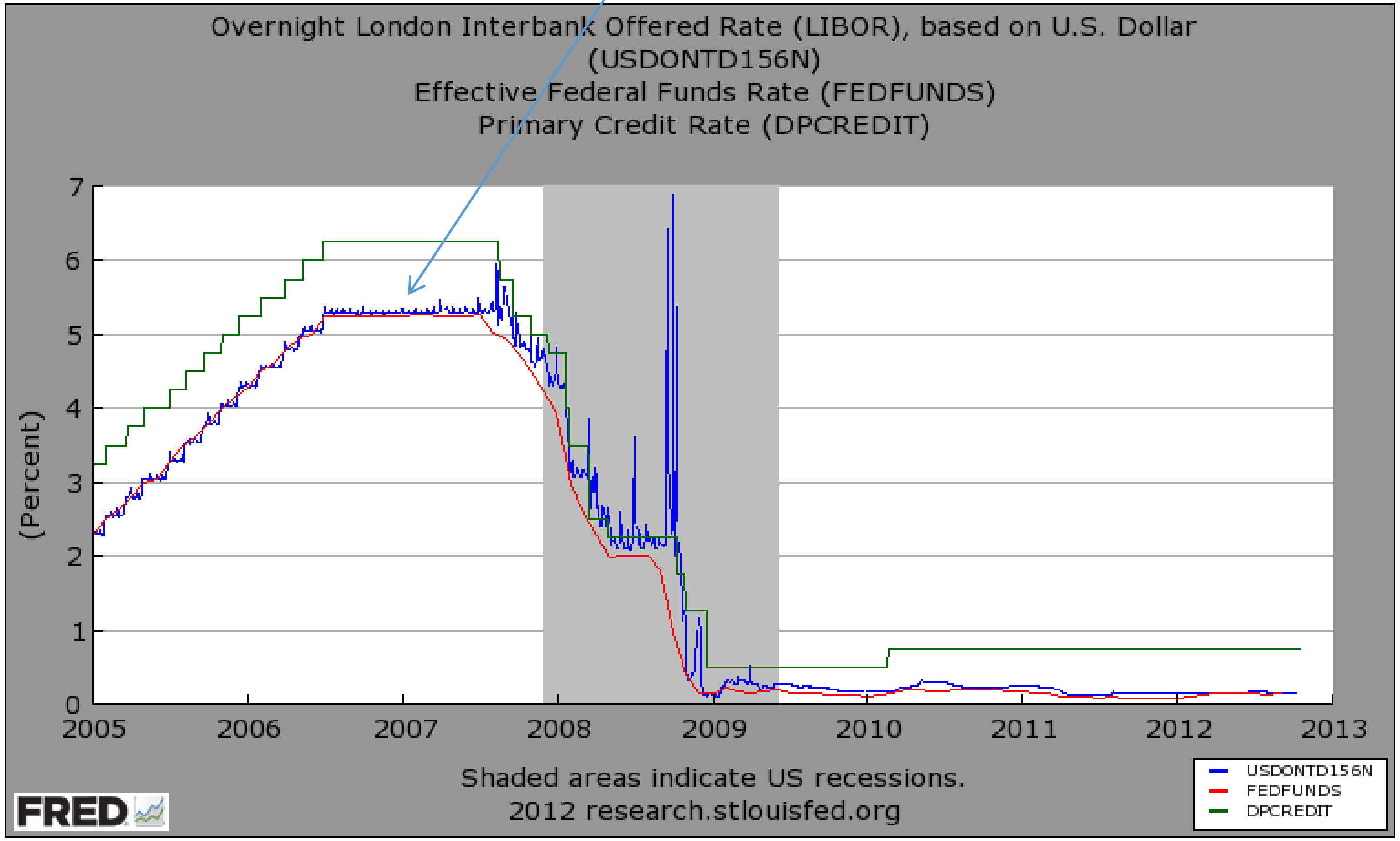
Lower losses in short of reserves when FedFunds Rate is low

- 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

Fed picks discount rate

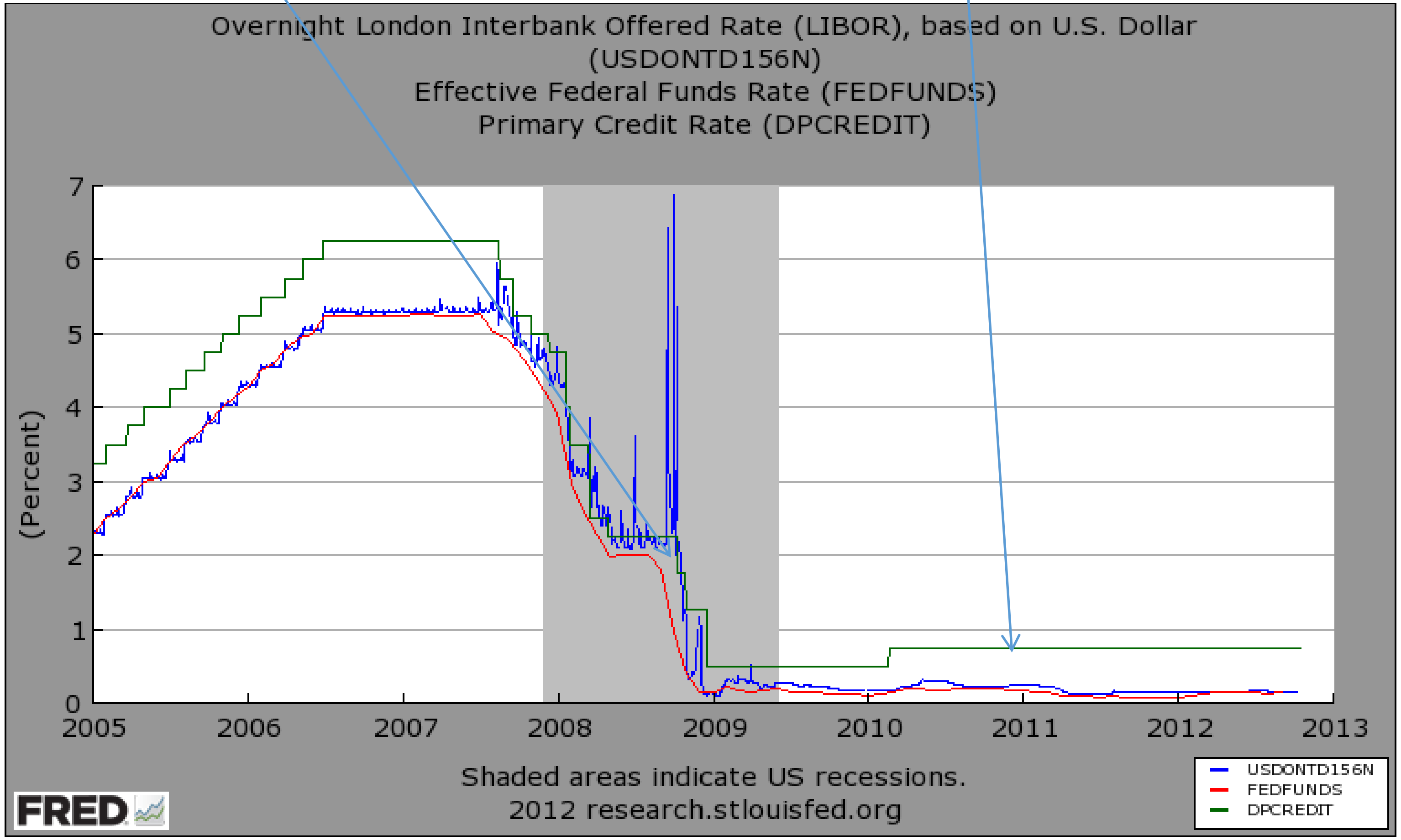


To affect this FedFunds Rate

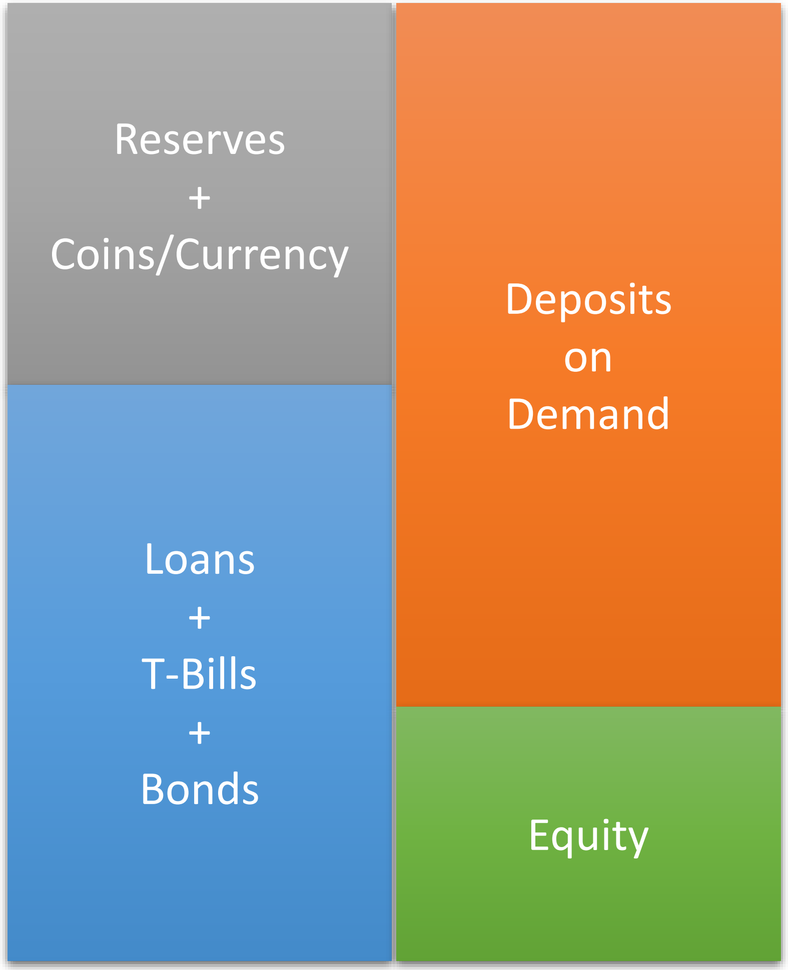


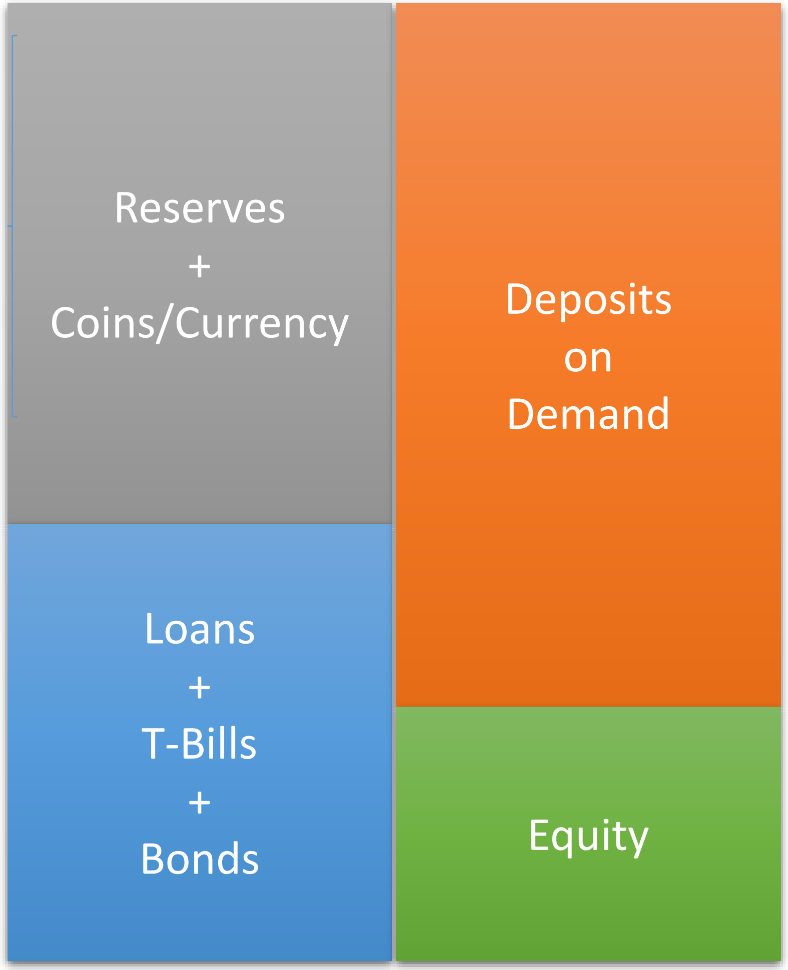
Lost Control During Crises

Cant really lower rates any more



Open Market Operations


Reserves
+
Coins/Currency
Loans
+
T-Bills
+
Bonds
Deposits
on
Demand
Equity


Reserves
+
Coins/Currency
Loans
+
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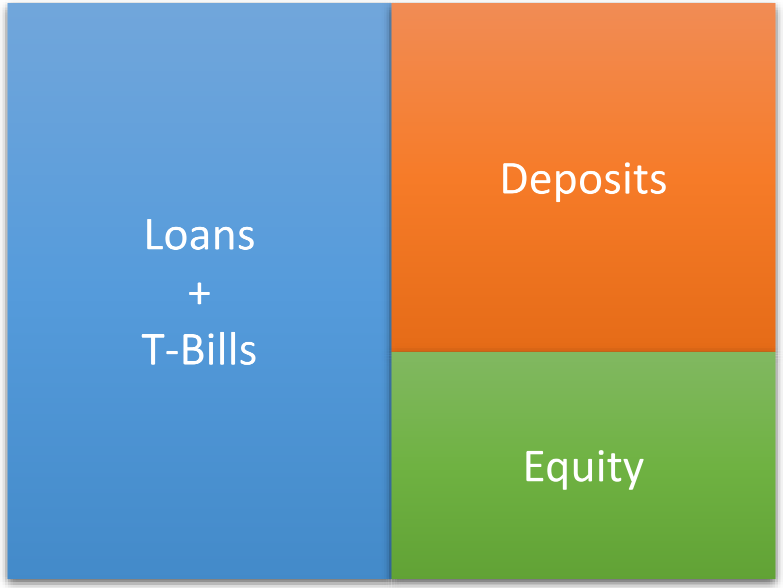
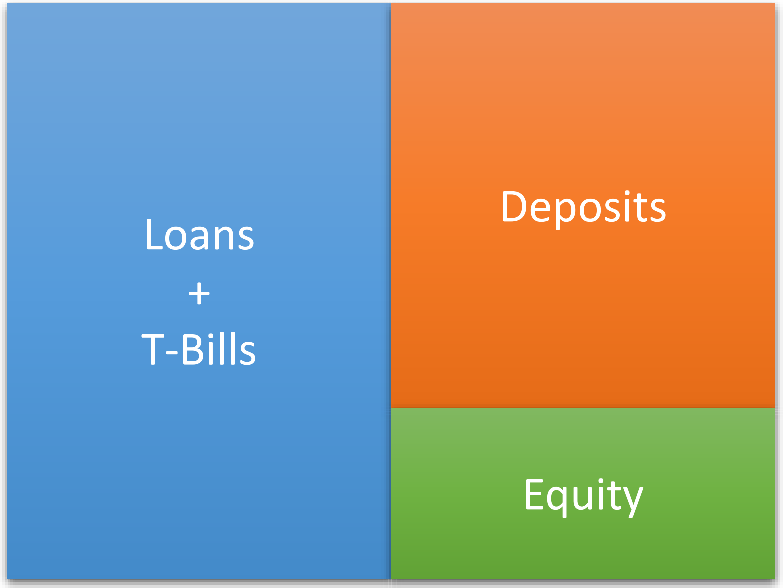
+
Bonds
Deposits
on
Demand
Equity



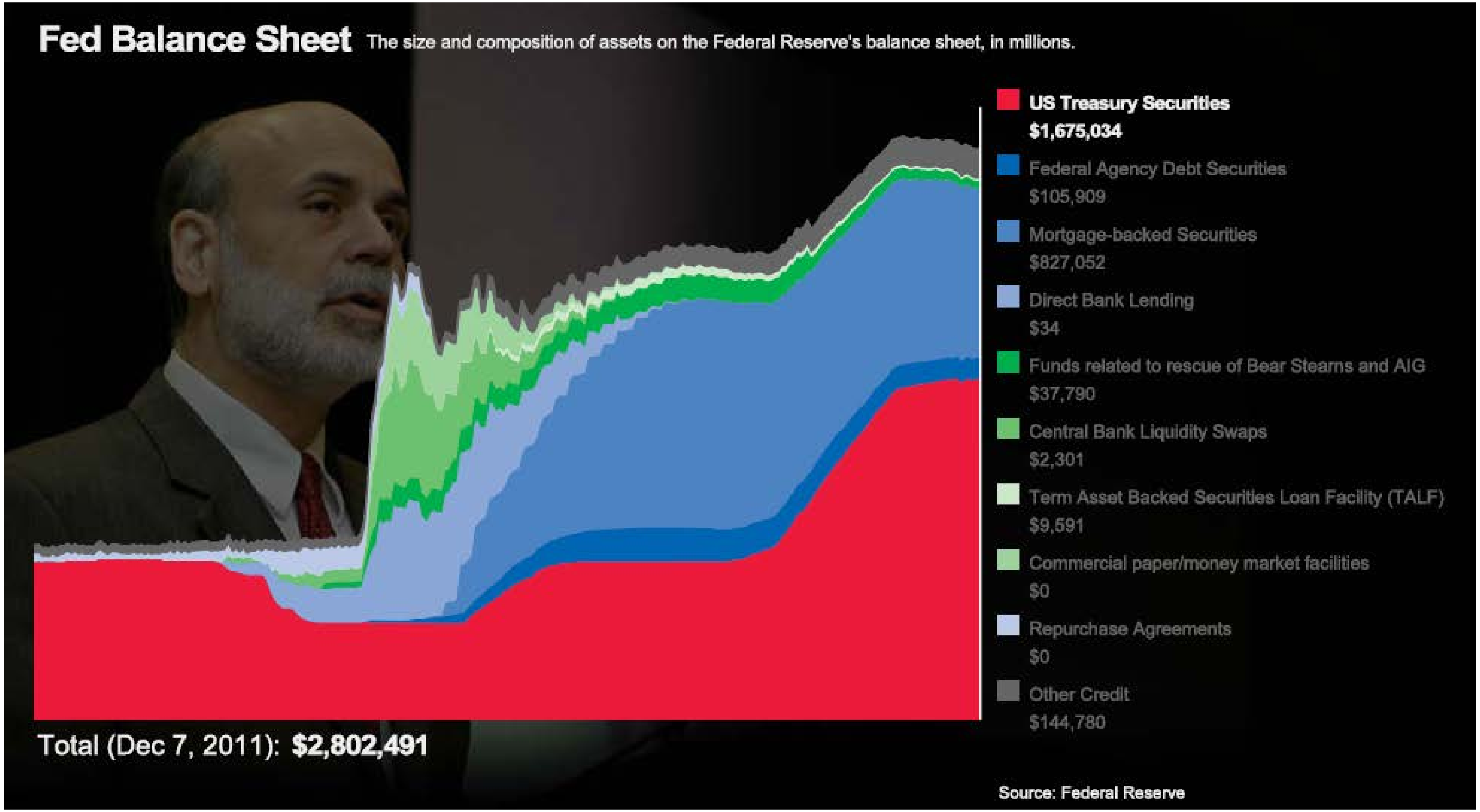
With FED OMO

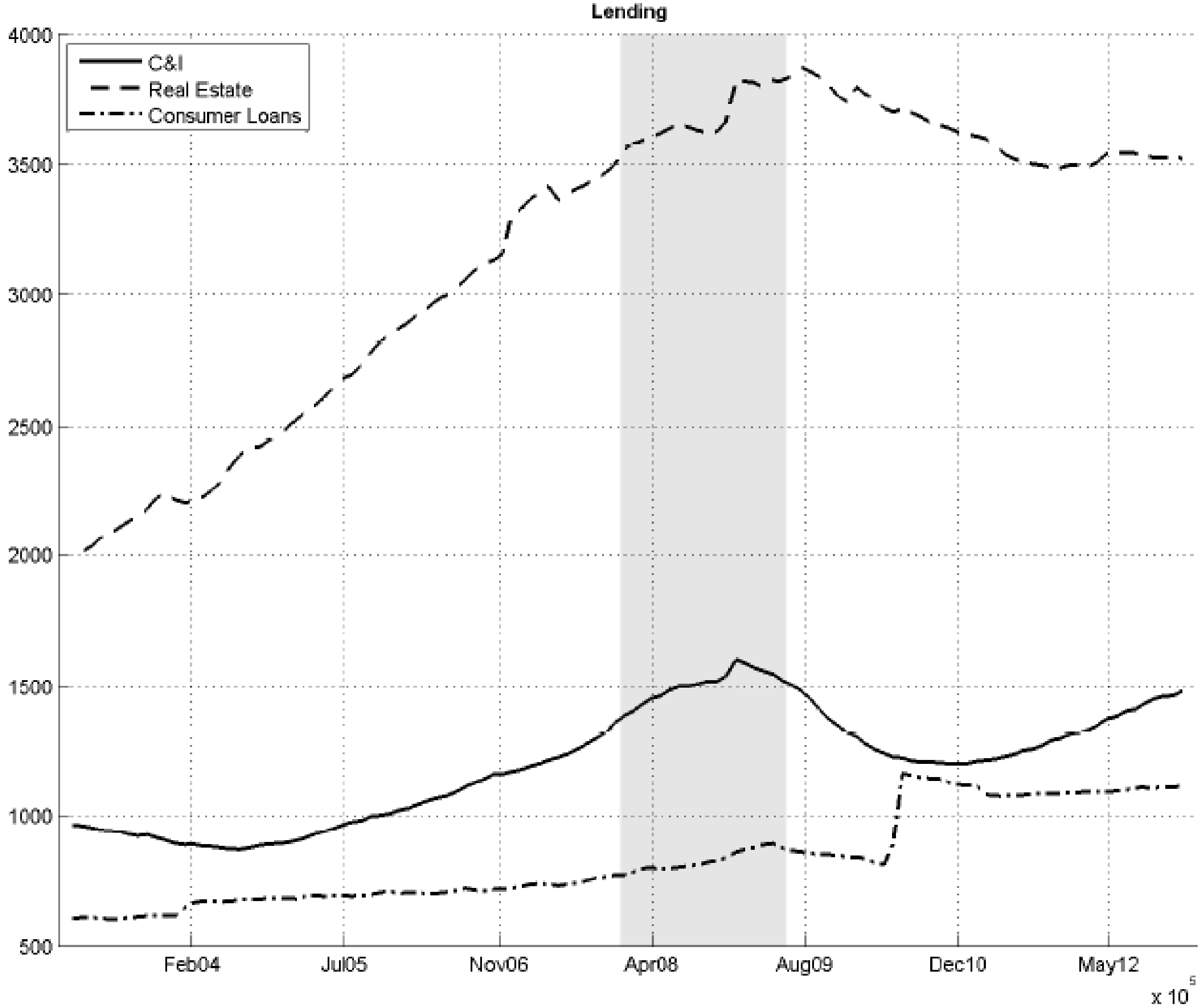


Without FED OMO

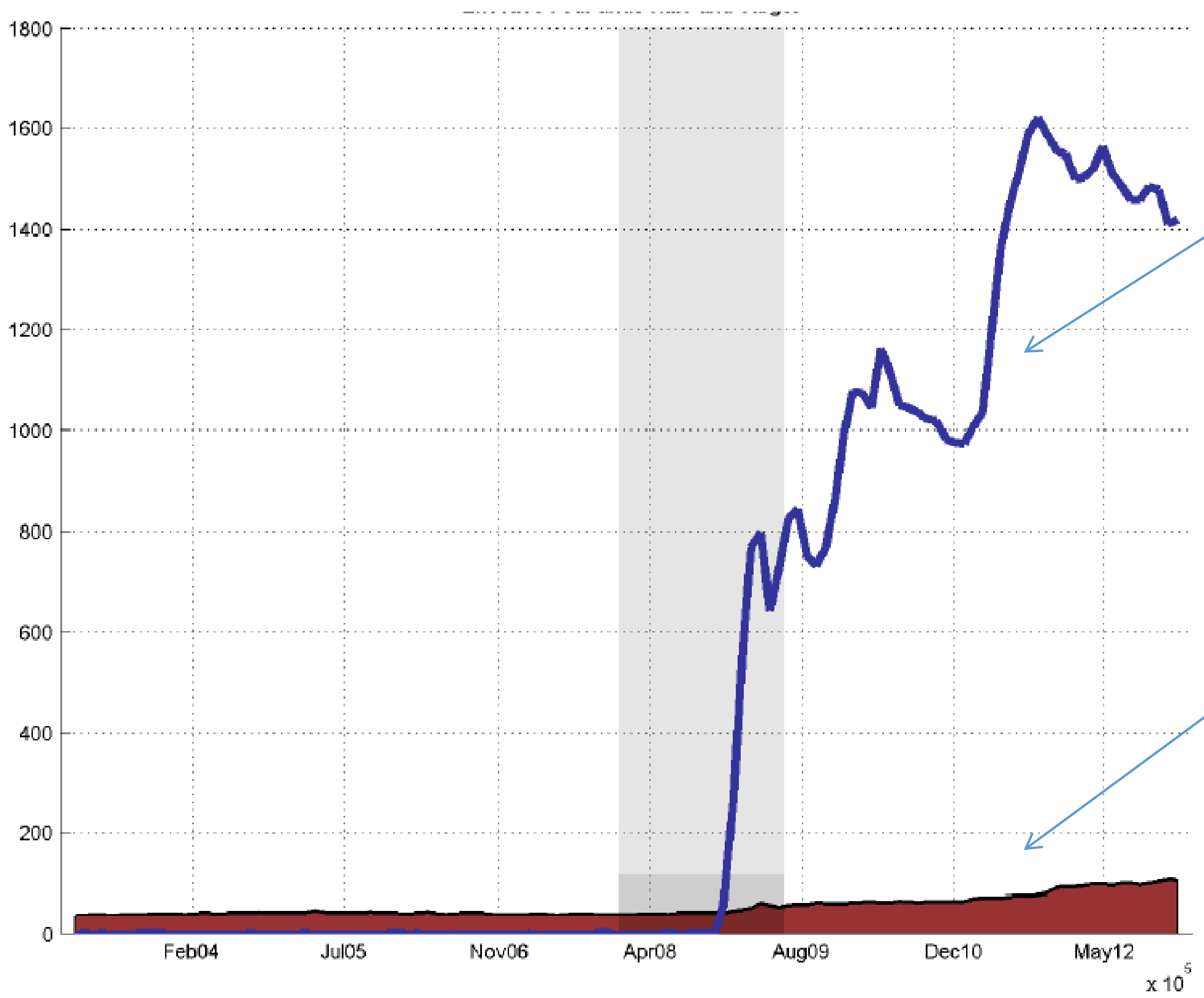
- Before withdrawal banks will make more loans
    - There are more reserves to buffer withdrawal
- After withdrawal, interest will be lower
    - Some other bank will have more reserves

- 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


Fed Balance Sheet
The size and composition of assets on the Federal Reserve's balance sheet, in millions.
US Treasury Securities
$1,675,034
Federal Agency Debt Securities
$105,909
Mortgage-backed Securities
$827,052
Direct Bank Lending
$34
Funds related to rescue of Bear Stearns and AIG
$37,790
Central Bank Liquidity Swaps
$2,301
Term Asset Backed Securities Loan Facility (TALF)
$9,591
Commercial paper/money market facilities
$0
Repurchase Agreements
$0
Other Credit
$144,780
Total (Dec 7, 2011): $2,802,491
Source: Federal Reserve



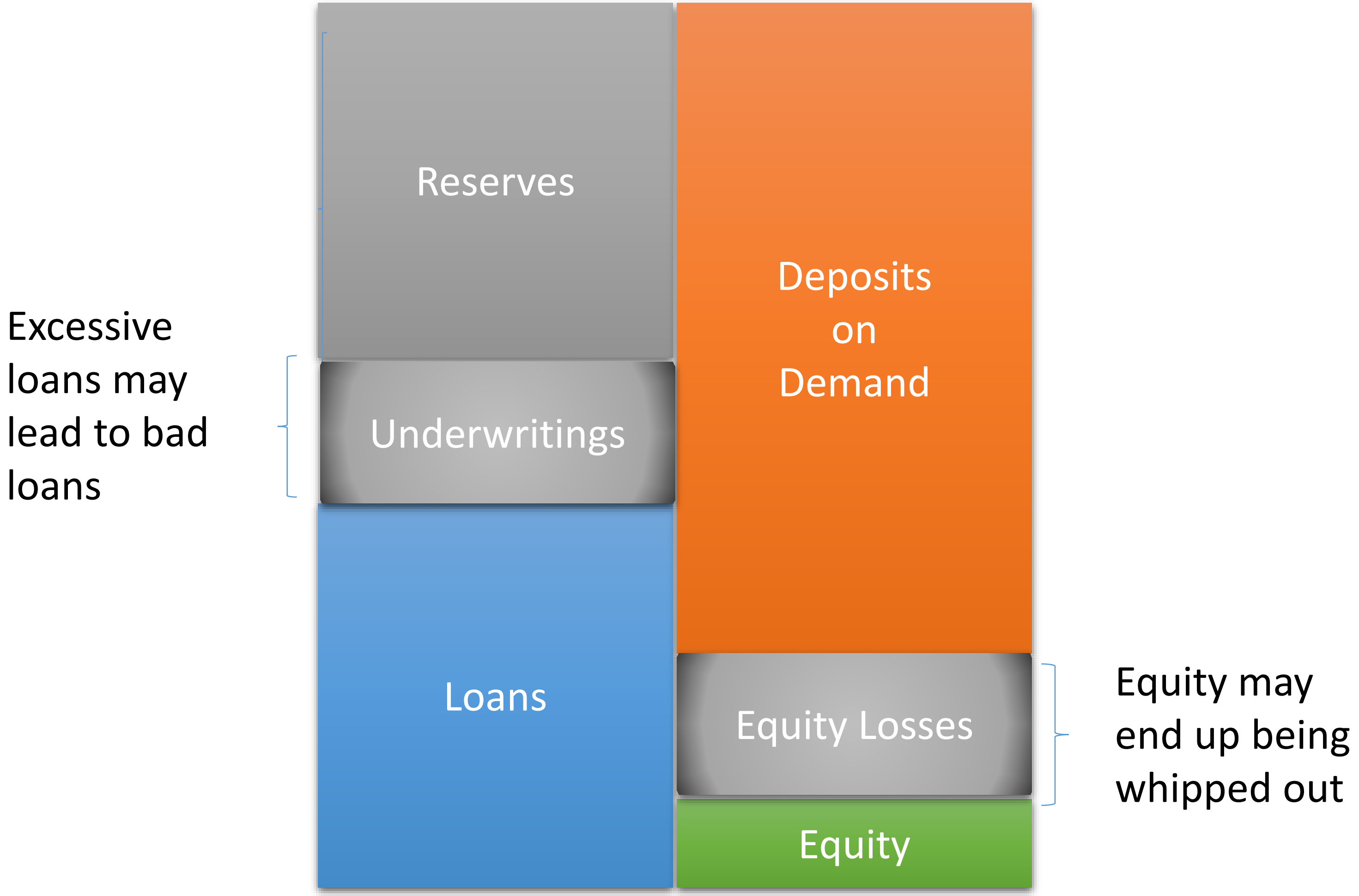
Lending
4000
3500
3000
2500
2000
1500
1000
500
C&I
Real Estate
Consumer Loans
Feb04
Jul05
Nov06
Apr08
Aug09
Dec10
May12
x 10^5



Banks are keeping reserves and not making loans

(top excess reserves, bottom required Reserves)

Credit Risk
(Solvency Risk)



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

- 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