Shadow Banking: Introduction & Implications

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Motivation

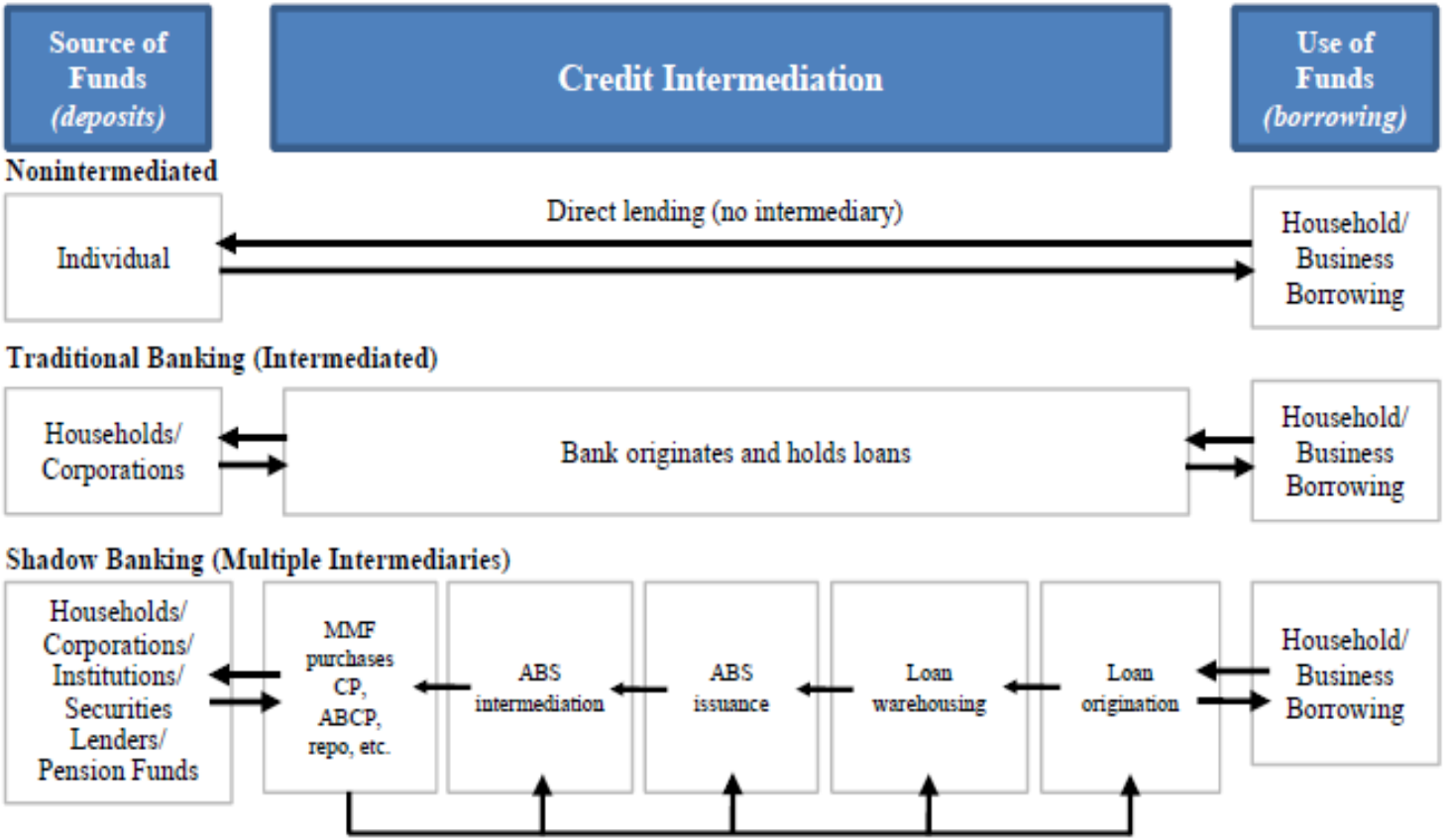
The shadow banking system is the least understood factor behind the global financial crisis of 2007/08:

- Global imbalances, savings glut, EM Current Account surpluses
- Search for yield and risk-taking/herding mentality
- Incomplete and inadequate banking supervision and regulation
- ***Emergence of the shadow banking system***

Scope

- To explain the basic functions of the banking system, i.e. maturity, liquidity and credit transformations
- Discuss the stabilising mechanisms of the financial system
- Discuss how these functions can be performed by institutions outside the formal banking sector creating a “shadow’ banking sector
- Present data on the rise and fall of the shadow banks

Three Levels of Credit Intermediation



NOTE: MMF is money market mutual fund, CP is commercial paper, ABCP is asset-backed CP, repo is repurchase agreement, and ABS is asset-backed securities. See Glossary for definitions.

Direct lending

The most straightforward form of lending but with substantial disadvantages:

- Huge screening costs of the creditworthiness of the borrower
- Huge monitoring costs of the risk-taking behaviour of the borrower
- No diversification benefits
- Substantial liquidity risks

Traditional Banking System

Traditional Banking: Originate to Hold

- The traditional idea of banking is that Banks bridge the gap between depositors and borrowers. They pool funds from those with excess supply and provide these funds to those with a shortfall.

- The added value of the banking system is linked to its ability to reduce the costs involved in screening and monitoring borrowers and by facilitating investments in a more diversified loan portfolio.

- The originate-to-hold model meant that banks would hold the loans extended to customers throughout the maturity of the loan.

Traditional Banking: 4 Functions

- Credit Intermediation-Pooling of Risks
- Maturity Transformation
- Liquidity Transformation
- Credit Transformation

Credit Intermediation-Pooling of Risks

- The major disadvantage of direct lending is increased credit risk due to the lack of credit diversification.
- Instead with banks as intermediaries, each depositor of a bank has an indirect claim on all the mortgages, business loans or credit card receivables owed to the bank rather than a claim on one specific mortgage or loan.

Maturity transformation

- Banks use short-term deposits to fund longer-term loans. Traditional deposits are a bank's liabilities, collected in the form of savings and checking accounts and redistributed as loans to consumers and businesses.

- Because short-term deposits are a bank's liabilities and long-term loans are its assets, there is an inherent risk in maturity transformation.

Liquidity Transformation

- Closely related to maturity transformation, liquidity transformation refers to the fact that a bank's assets are less liquid than its liabilities. Depositors' money (the liabilities that fund the assets) is available on demand at any time, while the loans (a bank's assets) have a longer, often fixed life.

- Most banks worldwide are required to hold only a fraction of bank deposits as cash on hand, available for withdrawal. This allows the banking system to create money after meeting the reserve requirements mandated by central banks.

- If all depositors simultaneously withdraw their funds, a bank is forced to sell assets to meet depositor demand. Such mass exits at fire-sale prices can cause bank insolvency as the value of assets declines below the value of liabilities.

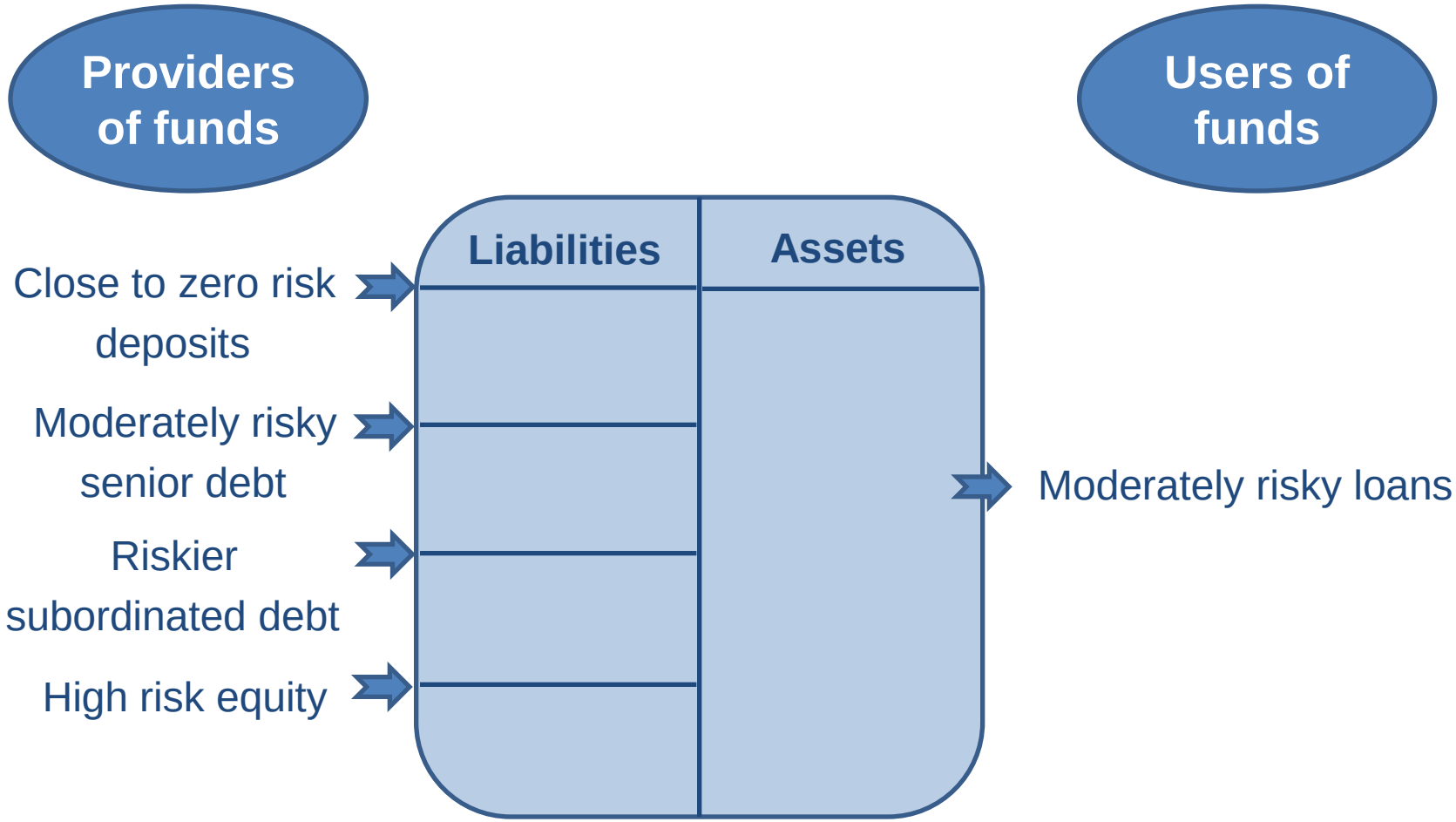
Credit Transformation

- While any individual loan carries risk specific to that transaction, a bank diffuses its overall risk exposure by lending to a large number of borrowers. Despite this diversification, the riskiness of a bank's assets usually exceeds that of its liabilities.

- The credit quality of the debt issued by an intermediary is enhanced by the priority of claims. Senior deposits are of better credit quality than the underlying loan portfolio because the intermediary's junior equity is available to absorb any losses.

- Taking on this credit risk is typically how banks earn a return above the cost of their liabilities, a concept known as net interest margin. Assuming banks hedge interest rate risk, they can earn the difference between their cost of funds (the weighted average rate paid on liabilities) and the weighted average rate at which they lend.

Credit Transformation



Source: Adair Turner et al. (2010), *The Future of Finance: The LSE Report*, London School of Economics and Political Science.

Banking (In)stability

Banking is potentially unstable for two reasons:

First, because maturity transformation is an inherently risky activity: if all the depositors want their money back simultaneously, they cannot have it.

As a result, entirely unregulated banking systems are susceptible to deposit runs which can be entirely rational for the individuals concerned, even if the bank is in some meaningful sense solvent.

Banking (In)stability

Second, because the volume of credit extended and money created can be subject to *strongly procyclical self-reinforcing cycles*, especially when credit is extended to buy assets which can go up in value such as residential or commercial real estate.

More credit lent drives up asset prices; higher asset prices tend to mean lower losses on credit extended; so banks have more equity capital to support further borrowing and the behaviour of both lenders and borrowers is influenced by the assumption that the good times will continue, that asset prices will continue to rise and the loan losses will remain low… until some shock in confidence occurs and the factors all operate in reverse direction.

Policy Tools

Because of these two features, entirely unregulated banking systems were inherently unstable. Banking was made potentially stable by four public policy interventions:

- Deposit insurance schemes, which removed the incentive to run from at least the covered deposits.
- Lender of last resort liquidity insurance provided by central banks.
- Prudential regulations which prescribed minimum required levels of equity capital and of liquid assets, thus limiting the extent of maturity transformation.
- Macroprudential tools - such as counter-cyclical capital buffers - which could deliberately lean against the power of the credit and asset price cycle.

Deposit Insurance

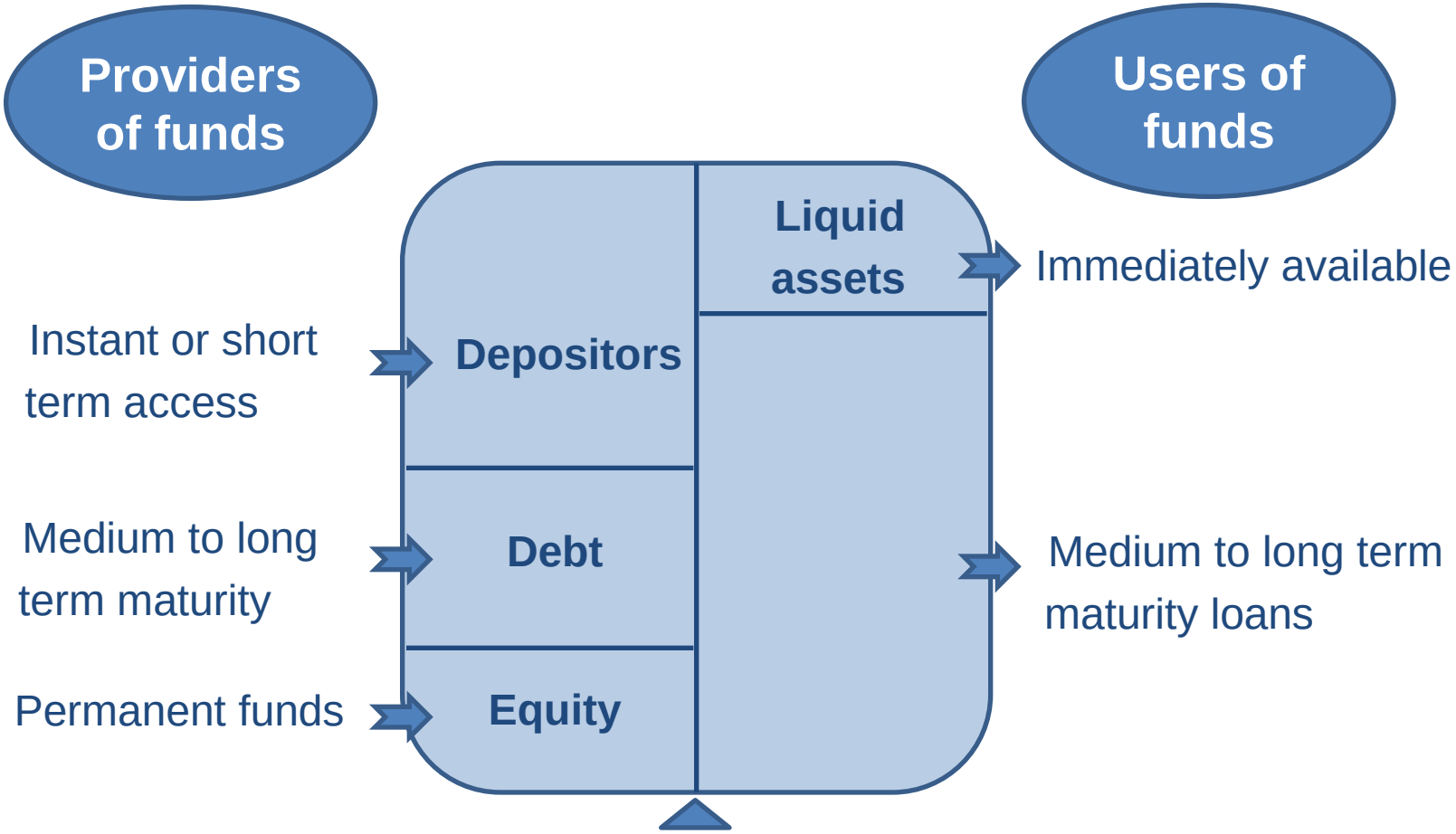
- At the first sign (or rumor) of trouble, depositors have every incentive to withdraw money from a potentially distressed bank. Because deposits were returned at par (one hundred cents on the dollar) until the bank became insolvent (or halted withdrawals), it paid to be the first person in line to retrieve money. In effect, there was a value transfer from late withdrawers to early withdrawers, incentivizing a rapid response to any concerns. Due to these incentives, the mere specter of insolvency could become a self-fulfilling prophecy.
- Thus, depositors panic and coordinated action increases the likelihood of systemic failure even though no single bank is large enough to collapse the system on its own.
- By offering deposit insurance authorities have significantly reduced the risk that depositors will withdraw funds in a panic

Lender of Last Resort

- While deposit insurance mostly mitigated the credit risk of bank depositors, it did not address liquidity needs that can arise from bank loans that have longer maturity and less liquidity relative to liabilities. To ensure ample liquidity during times of stress, banks have access to the Central Bank. Credit from CBs is available to generally sound depository institutions on a very short-term basis, typically overnight, at a rate above the MRO rate.

- These occasional short-term advances of credit are a backup rather than a regular source of funding, as evidenced by their above-market pricing. The discount window as a liquidity backstop contributes to the central bank's function as lender of last resort.

Traditional Banking



Source: Adair Tuner et al. (2010), *The Future of Finance: The LSE Report*, London School of Economics and Political Science.

Shadow Banking System

A paradigm shift in Banking: Originate to Distribute

- Higher liquidity and capital demands by regulators meant that the pace at which banks could expand their balance-sheets (i.e. the pace at which the banks could grow) was severely constraint. Furthermore returns on equity where lower than investors' expectations.

- The "novel" idea that emerged in the '90 that allowed banks to circumvent this constraint was for banks to act simply as originators and servicers of new credit without retaining the exposure till maturity. This new banking model was named "originate to distribute" .

Originate to Distribute (OtD)

- According to this model banks are now intermediates between borrowers and investors instead of depositors.
- The transfer of assets to third-party investors is achieved via the issuance of Asset Backed Securities (ABS).
- The brilliant idea is that ABS were tranched allowing banks to perform the liquidity and credit transformations off-balance sheet.

The Catalyst for OtD: Securitisation

- Most people view securitization as a “technique” that allows banks to achieve higher returns and lower capital charges. In a nutshell, Securitization allowed Banks to stop holding the loans extended to customers until maturity. Instead loans could be “sold” or “transferred” to third party investors, according to the originate-to-distribute principle.

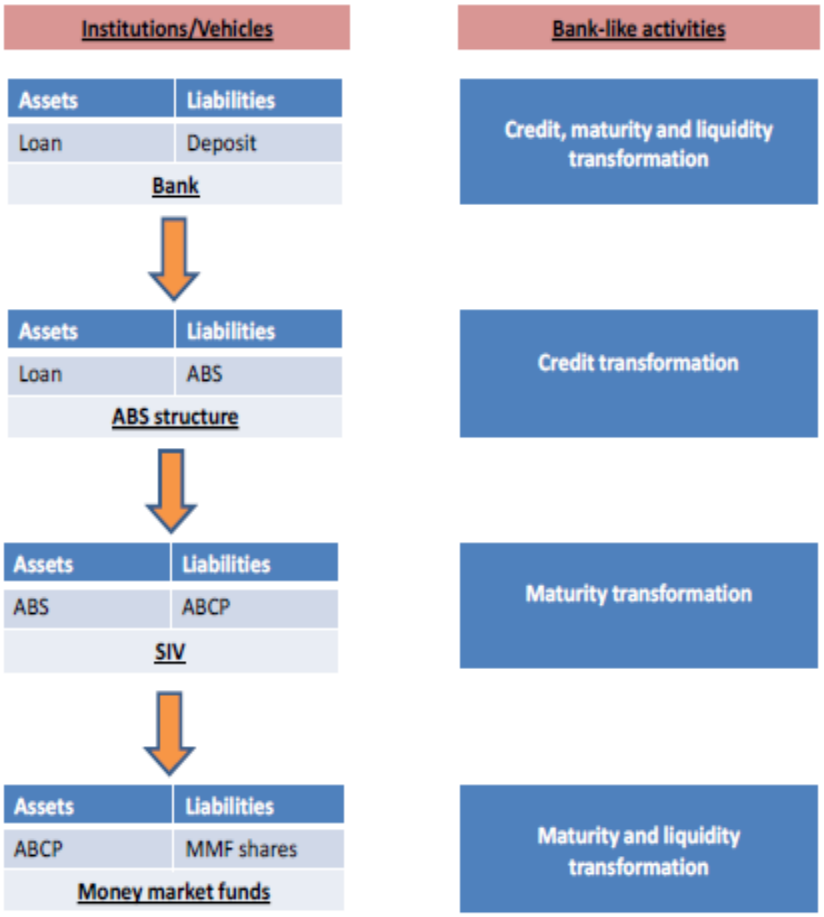
- Securitization revolutionized that Banking industry in ways that nobody had ever imagined. Without securitisation the creation of the Originate-to-Distribute banking model would have been impossible

The Set-up of the Shadow Banks

- A banking institution identifies a pool of loans which – via securitization techniques – transfers ("sells") to a bankruptcy-remote Structured Investment Vehicle (SIV). The SIV in turn funds the purchase of the loans through the issuance of Asset Backed Securities (ABS). The process can stop there with the ABS being sold to final investors.

- Nevertheless some investors prefer (or are restricted) to invest in short-term securities (such as T-Bills) rather than longer-term securities like ABS. To satisfy investors with a preference to short-term instruments a Conduit pools ABS and funds the purchase through the issuance of Asset Backed Commercial Paper (ABCP). The ABCP is placed with Money Market Mutual Funds which in turn raise the cash via selling shares to the retail public.

Process of Shadow Banking



Key Features of Shadow Banks

- Similar functions to the “official” banking sector, i.e. Maturity, Liquidity and Credit Transformation

So

- Similar risks of “bank runs” and “liquidity crunches”

But no official regulation and no official “backstops”

Implications of Shadow Banking

- So Shadow Bank is every financial institution that performs “bank-like” credit intermediation, which includes credit, liquidity and maturity transformation, without the strict regulatory and supervisory monitoring regarding capital and liquidity buffers and without the classic safety mechanisms of Deposit Insurance and LOLR

- As they are not subjected to the same regulatory requirements as banks and also do not have access to public safety nets, they are particularly exposed to runs

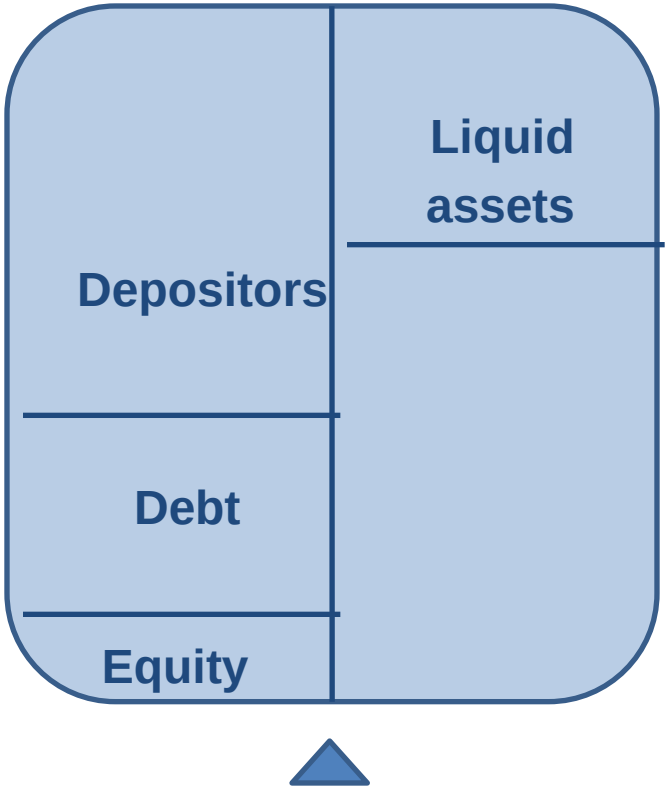
Private Sector "Back-Stops"

- Use of collateral to mitigate counterparty and credit risk
- Bankruptcy remote structures
- Liquidity lines and credit guarantees to mitigate "run-risks"
- Multiple Rating Agencies assessments

BUT

Value of the Guarantee = Strength of Guarantor

Official Sectors Backstops More reliable than Private sector's guarantees



- ***Deposit insurance, L.O.L.R***
- ***Basel III, Macroprudential Reg***

Source: Adair Tuner et al. (2010), *The Future of Finance: The LSE Report*, London School of Economics and Political Science.

Two Definitions

- According to Pozsar et al. (2010), the shadow banking sector can be defined as "***financial intermediaries that conduct maturity, credit, and liquidity transformation without access to central bank liquidity or public sector credit guarantees***".

- Buiter (2008): "***The shadow banking sector consists of the many highly leveraged non-deposit-taking institutions that lend long and illiquid and borrow short in markets that are liquid during normal or orderly times but can become very illiquid when markets become disorderly. They are functionally very similar to banks but are barely supervised or regulated. They hold very little capital, are not subject to any meaningful prudential requirements as regards liquidity, leverage or any other feature of their assets and liabilities***."

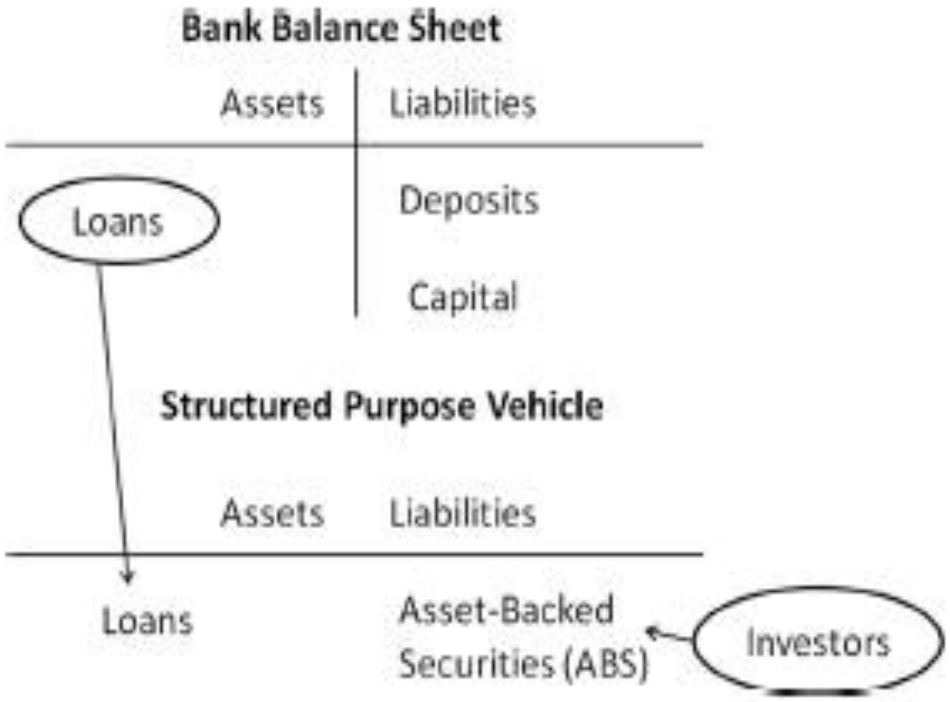
A more Generic Definition of Shadow Banking

- ***All financial activities and all financial intermediaries – expect traditional (regulated) banking institutions – which require a private or public backstop (safety net) to operate are part of the so-called shadow banking system***

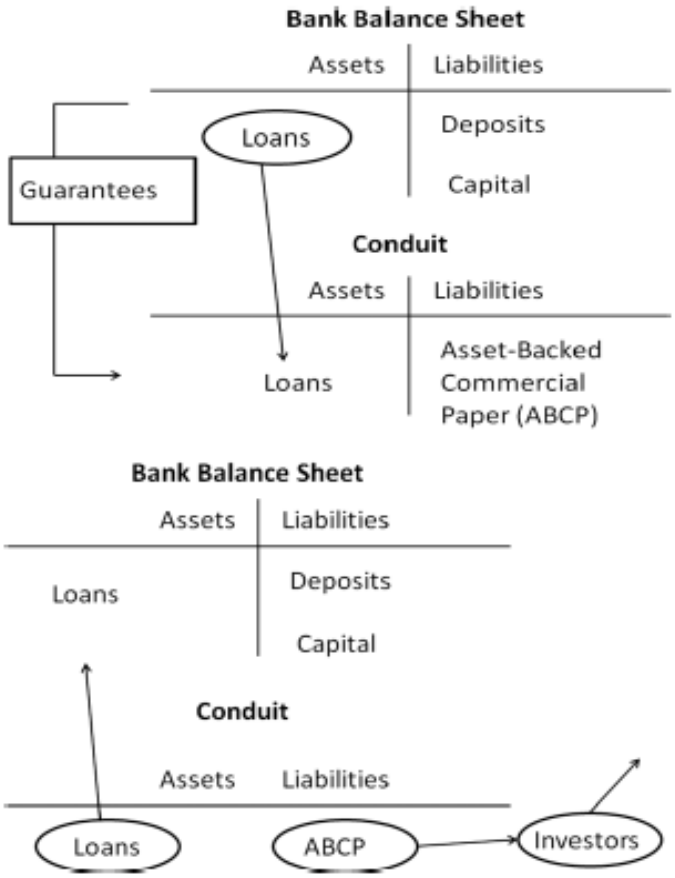
Some Examples of Asset Backed Structures

Asset Backed Commercial Paper

- The loans are transferred to an SPV which finances the purchase of the loans from the Bank by issuing ABCP



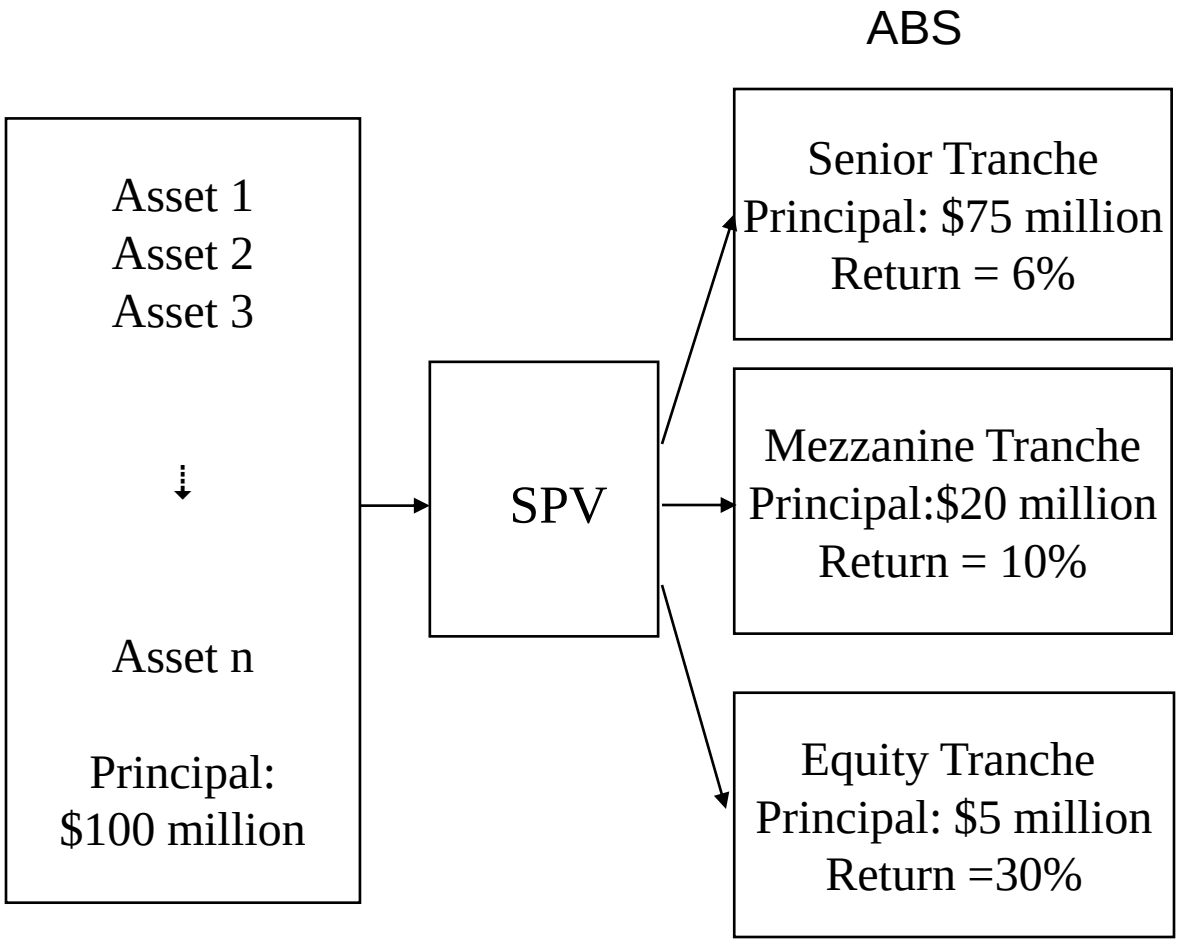
To protect outside investors against roll-over risk, the financial institution that manages the conduit typically provides credit guarantees to outside investors which promise to pay off maturing ABCP in case the conduit is unable to do so. From an investor's perspective, the combination of credit guarantees and conduit's assets substantially reduces the default risk of asset-backed commercial paper.



Impact of ABCP

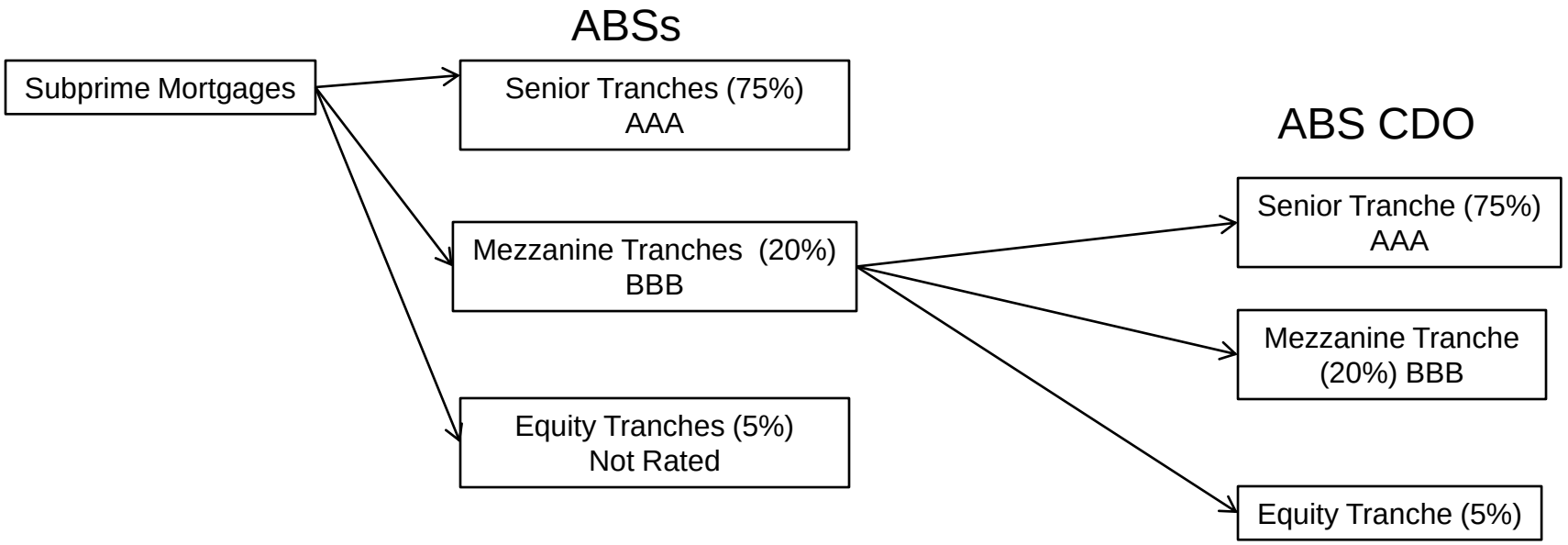
- Money market Funds & Mutual Funds are the main investors in ABCP.
- Regulations prevent money market funds from purchasing long-term assets such as mortgage-backed securities. However, the availability of asset-backed commercial paper provided money market funds with an opportunity to invest in such securities indirectly. According to some, the growth of the asset-backed commercial paper market was fuelled by demand from money market funds, which eventually spurred the rise in housing prices before the financial crisis.
- *As a result, the asset-backed commercial paper market enabled transforming short-term assets into long-term assets—a function which is typically reserved for* ***financial institutions operating under strict bank regulations****.*

Asset Backed Securities (Simplified)



A "waterfall" defines the precise rules for allocating cash flows to tranches

ABS CDOs or Mezz CDOs (Simplified)



How much of the original portfolio of subprime mortgages is AAA?

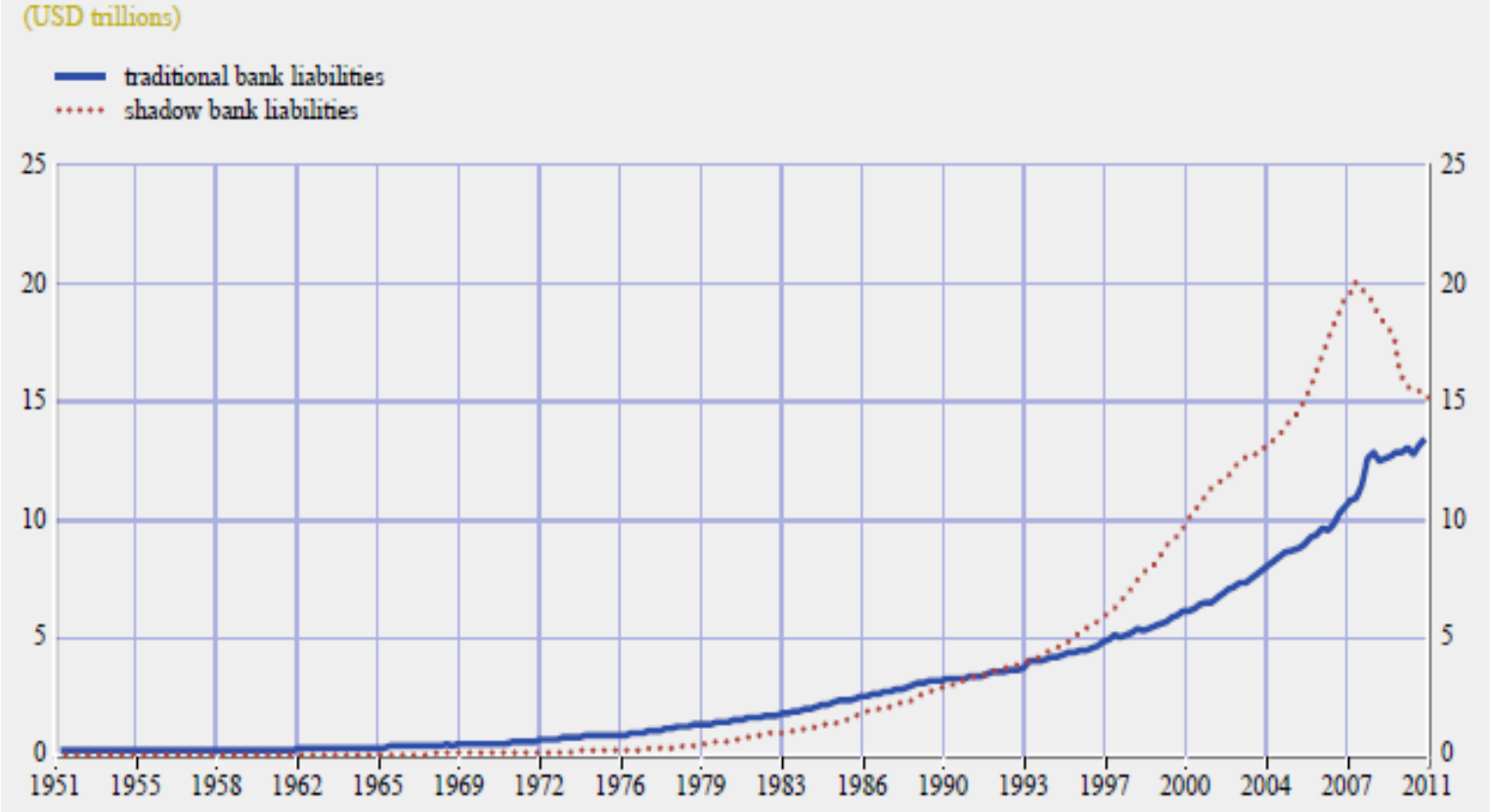
Impact of Asset Backed Securities

- The Bank identifies a pool of mortgages or other assets that wants to "sell" to outside investors. These mortgages are "pooled" and transferred to a bankruptcy remote Structured Purpose Vehicle. The SPV funds the purchase of these loans by issuing ABS to investors. The ABS will be serviced by the interest and principal payments made by the original home owners.

- The ABS are "structured", meaning that they are "tranched" so that each trench enjoys a different degree of seniority and hence riskiness relative to all other trenches and different to the riskness of the original mortgages. *This is a form of "credit transformation" that usually happens only* ***on balance sheet****.*

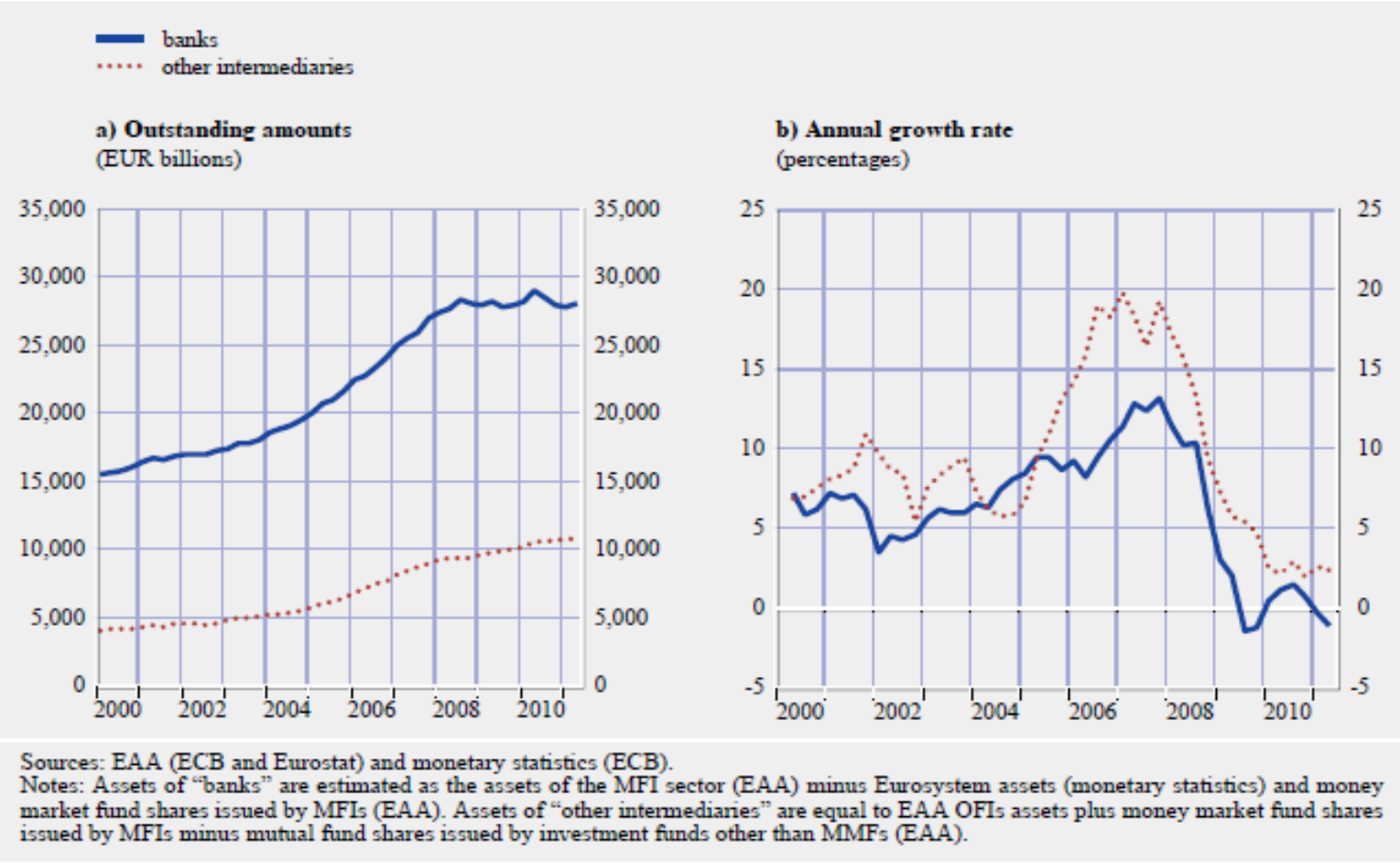
Rise and Fall of the Shadow Banking System

Growth in the US Shadow Banking



Source: Flow of Funds Accounts of the United States compiled on the basis of the definitions from Pozsar et al., (2010).

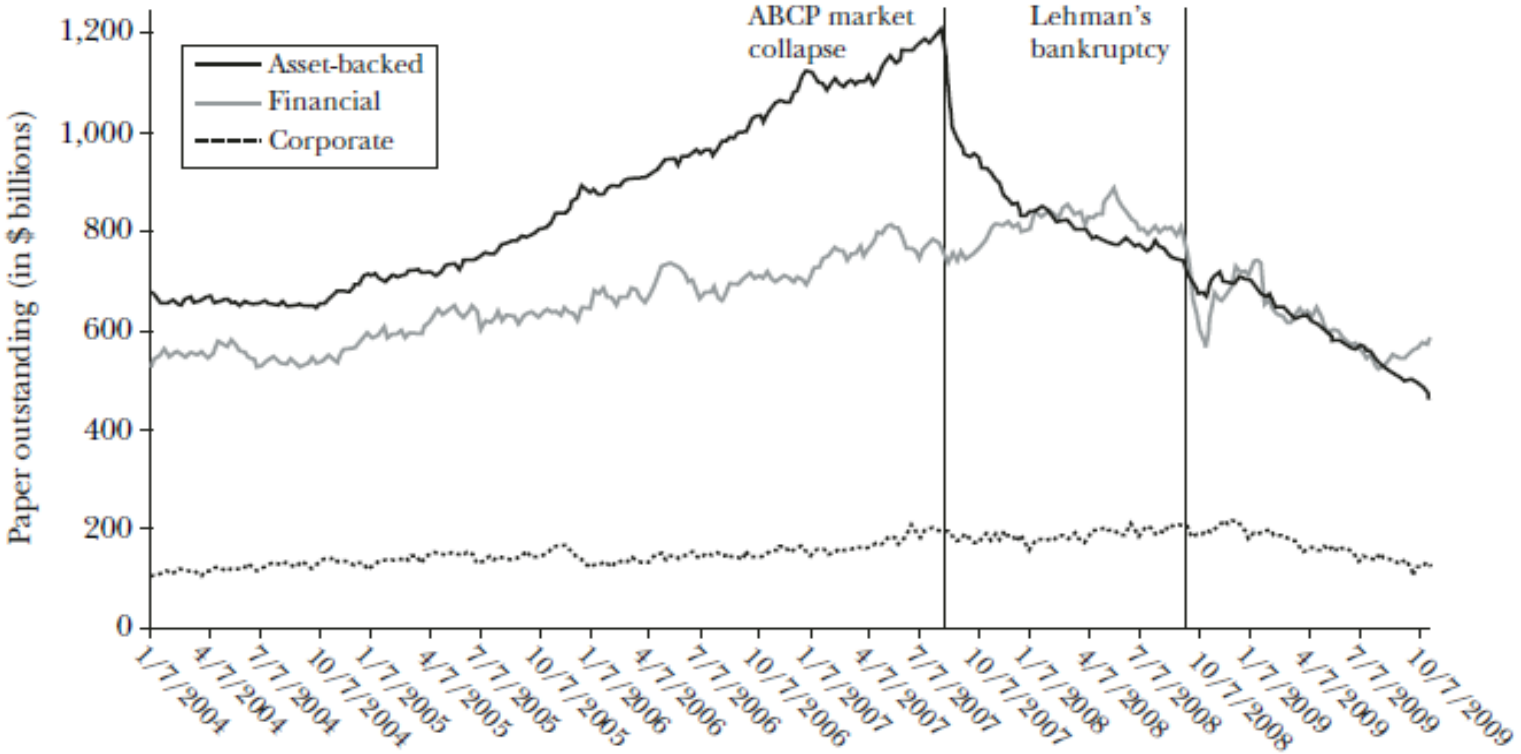
Growth in the EU Shadow Banking



Sources: EAA (ECB and Eurostat) and monetary statistics (ECB).
Notes: Assets of "banks" are estimated as the assets of the MFI sector (EAA) minus Eurosystem assets (monetary statistics) and money market fund shares issued by MFIs (EAA). Assets of "other intermediaries" are equal to EAA OFIs assets plus money market fund shares issued by MFIs minus mutual fund shares issued by investment funds other than MMFs (EAA).

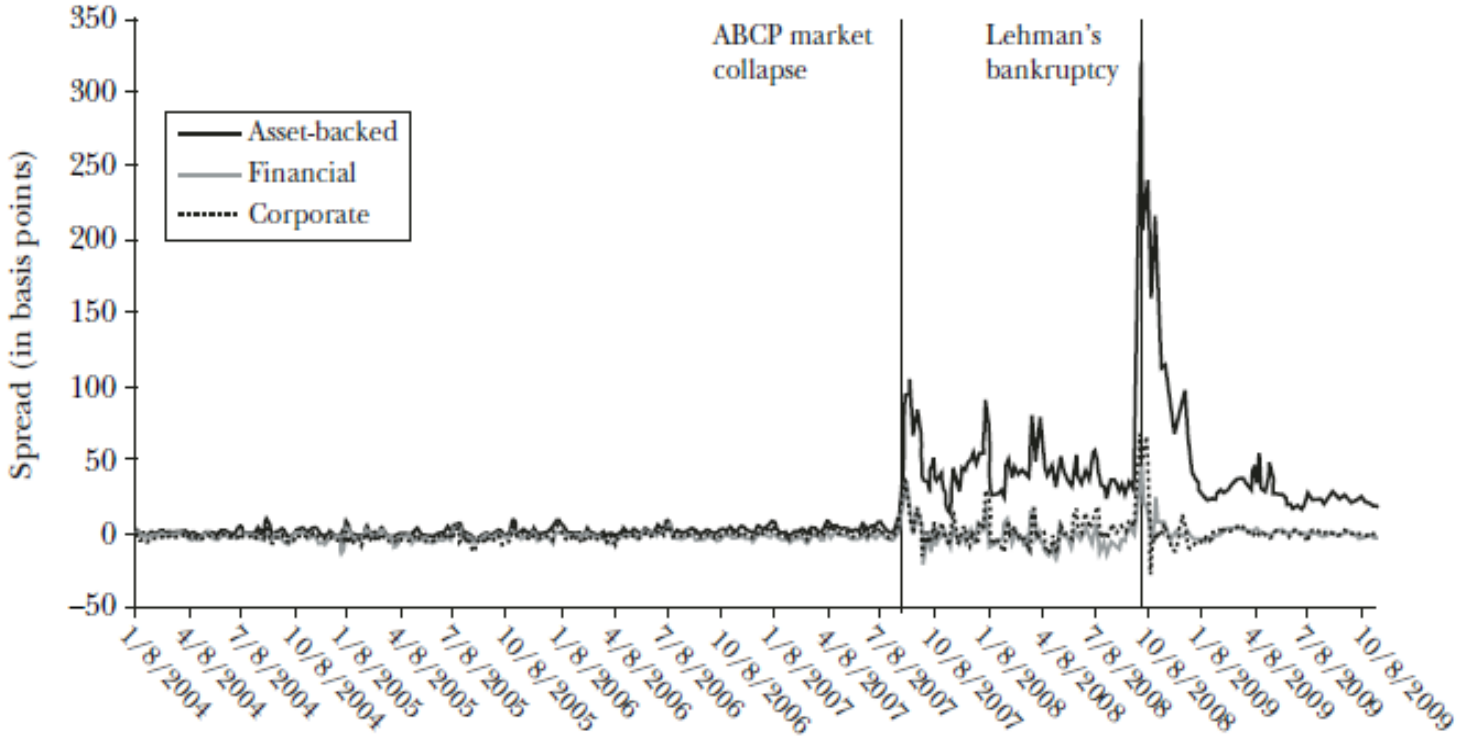
The Rise and Fall of ABCP

Commercial Paper Outstanding, January 2004–October 2009

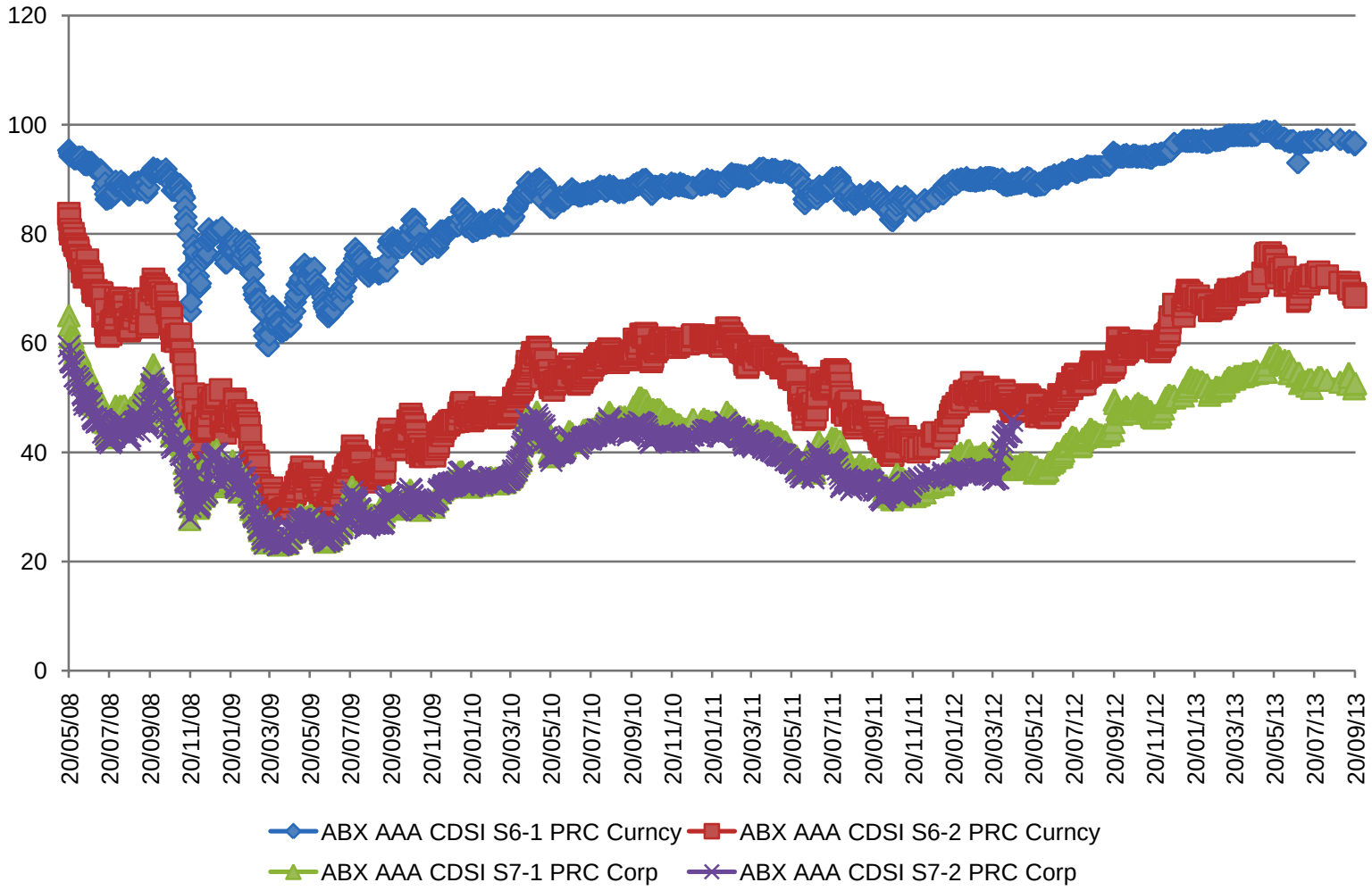


Pricing of ABCP

Overnight Commercial Paper Spreads (Net of Fed Funds Rate), January 2004–October 2009

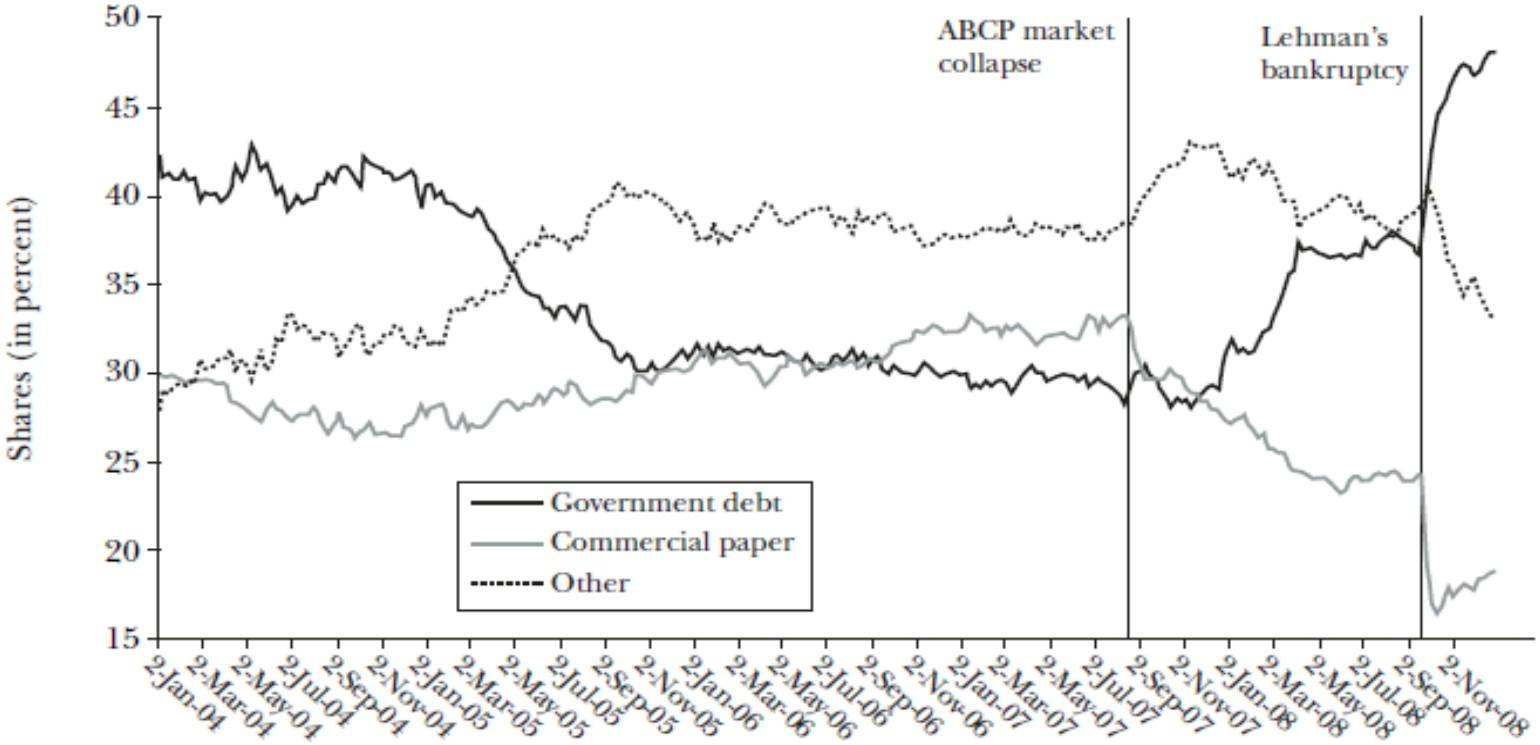


Subprime Mortgage AAA-Tranche Pricing



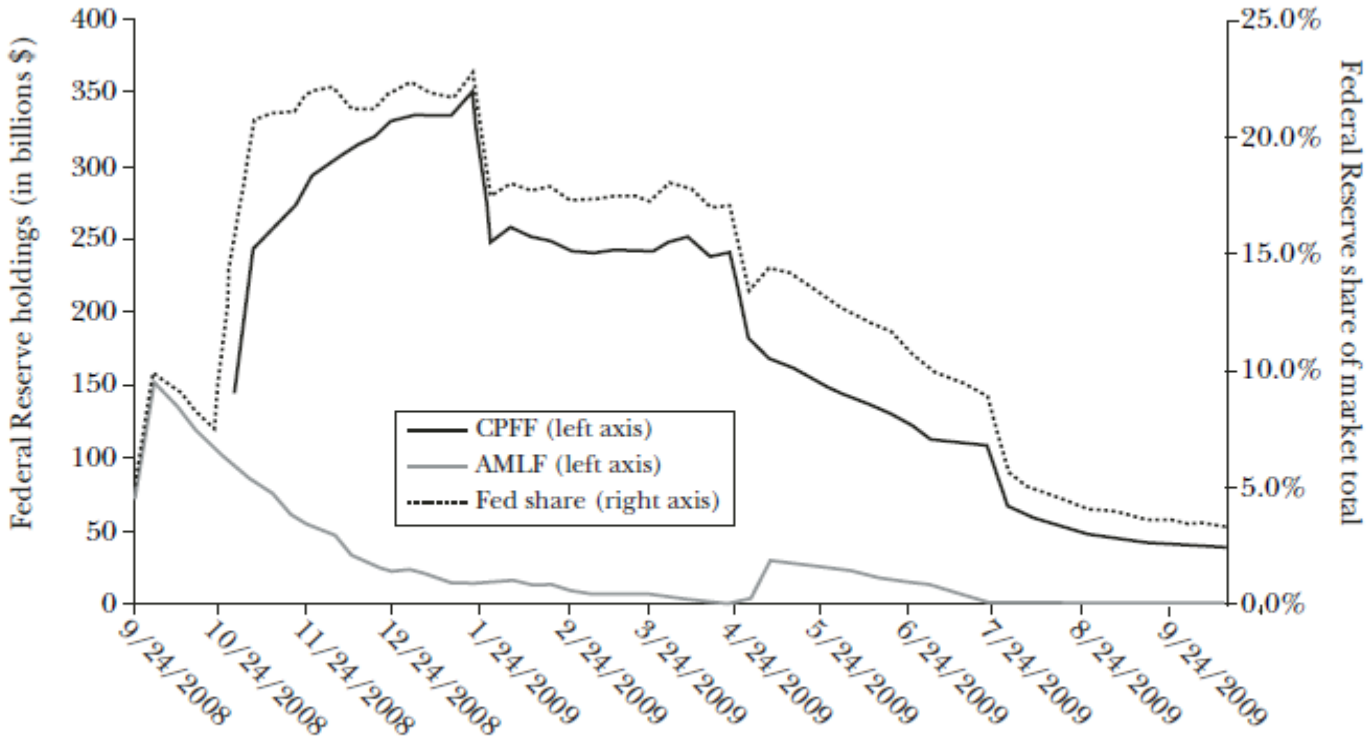
Money Market Funds' Flight to Quality

Money Market Funds' Asset Shares in Total Holdings, January 2004–December 2008



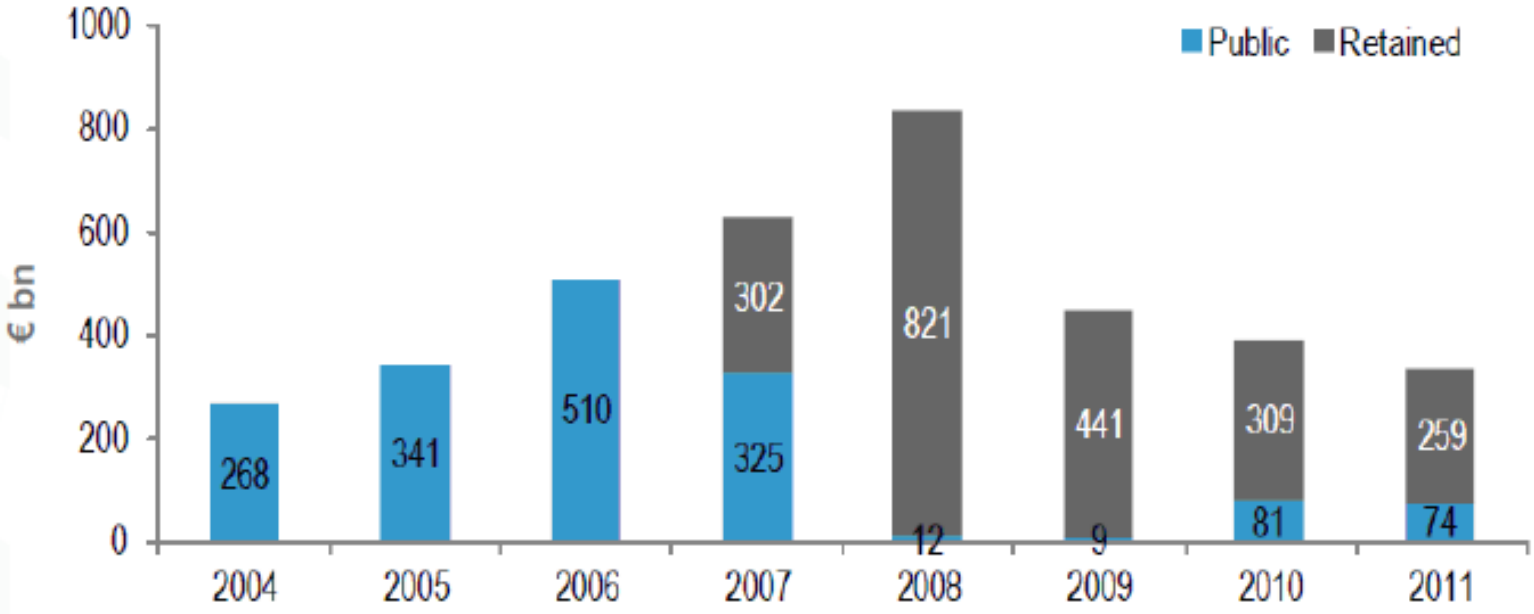
The US Fed as a LOLR for the Shadow Banking System

Holdings of Commercial Paper by Fed Funding Facilities: September 2008–October 2009



Source: Based on Federal Reserve Board and New York Federal Reserve data.
Note: The CPFF the Commercial Paper Funding Facility. The AMLF is the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility.

European securitisation issuance volumes



End of Lecture