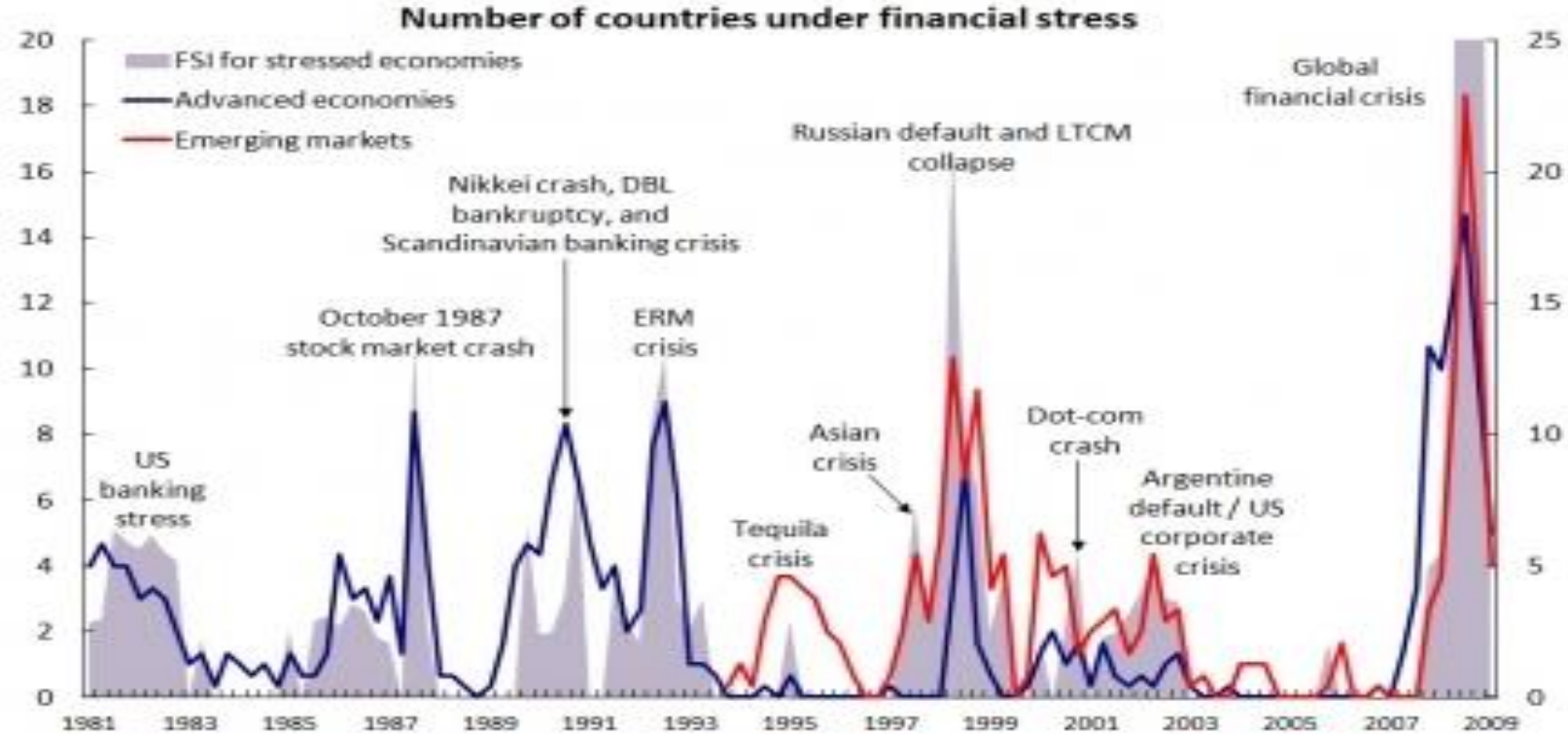
Durham University Business School

BANKING
&
FINANCIAL MARKETS

Ercument Aksak
Durham Business School
e.a.aksak@durham.ac.uk

Durham University Business School

History of Crises



A Living Subject

Largest US Bank Failures

Bank name	Bank failure date	Assets*
Washington Mutual Bank	Sept. 25, 2008	$307 billion
First Republic Bank	May 1, 2023	$212 billion**
Silicon Valley Bank	March 10, 2023	$209 billion**
Signature Bank	March 12, 2023	$110 billion**
IndyMac Bank, F.S.B.	July 11, 2008	$31 billion
Colonial Bank	Aug. 14, 2009	$26 billion
First Republic Bank-Dallas, N.A.	July 29, 1998	$17 billion

Assets rounded to nearest billion

***From the Federal Reserve as of Dec. 31, 2022*

**** This list only includes failures and does not include banks that were provided assistance.*

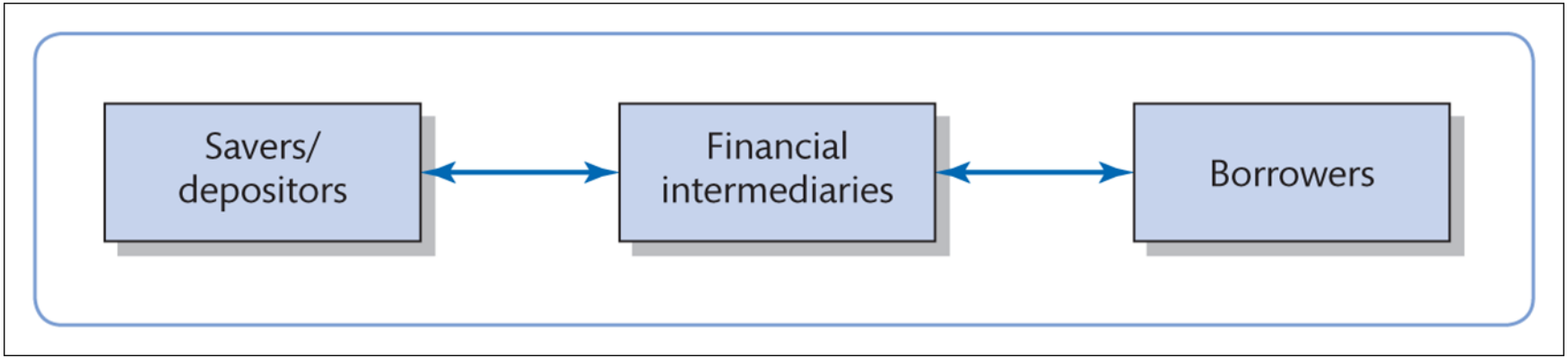
Module Delivery

- Module delivery - Lectures:
  - 2-hours lectures every week.
  - Every week the outline, delivery plan, and **all slides and supporting material will be uploaded** to Learn Ultra **before the lecture**.
  - **Theory & Frameworks: Pattern recognition.**
  - **Podcasts** based on the lecture material will be uploaded after the lecture.
- Module delivery - Workshops:
  - Small group teaching.
  - Attendance is compulsory.
  - **Focus more on the application and practical problems**

I. Banks and Markets

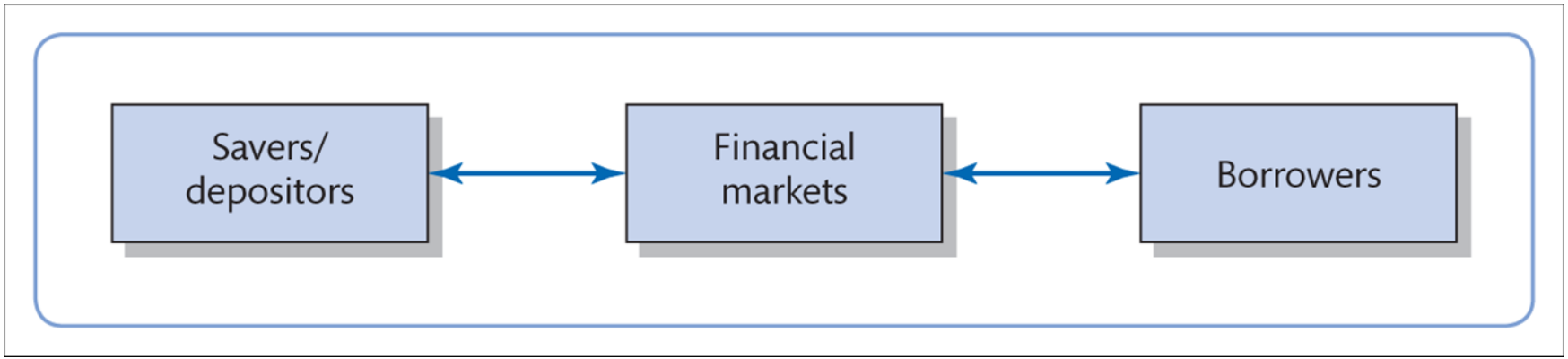
How do Funds Circulate?

The intermediation function



How do Funds Circulate? (2)

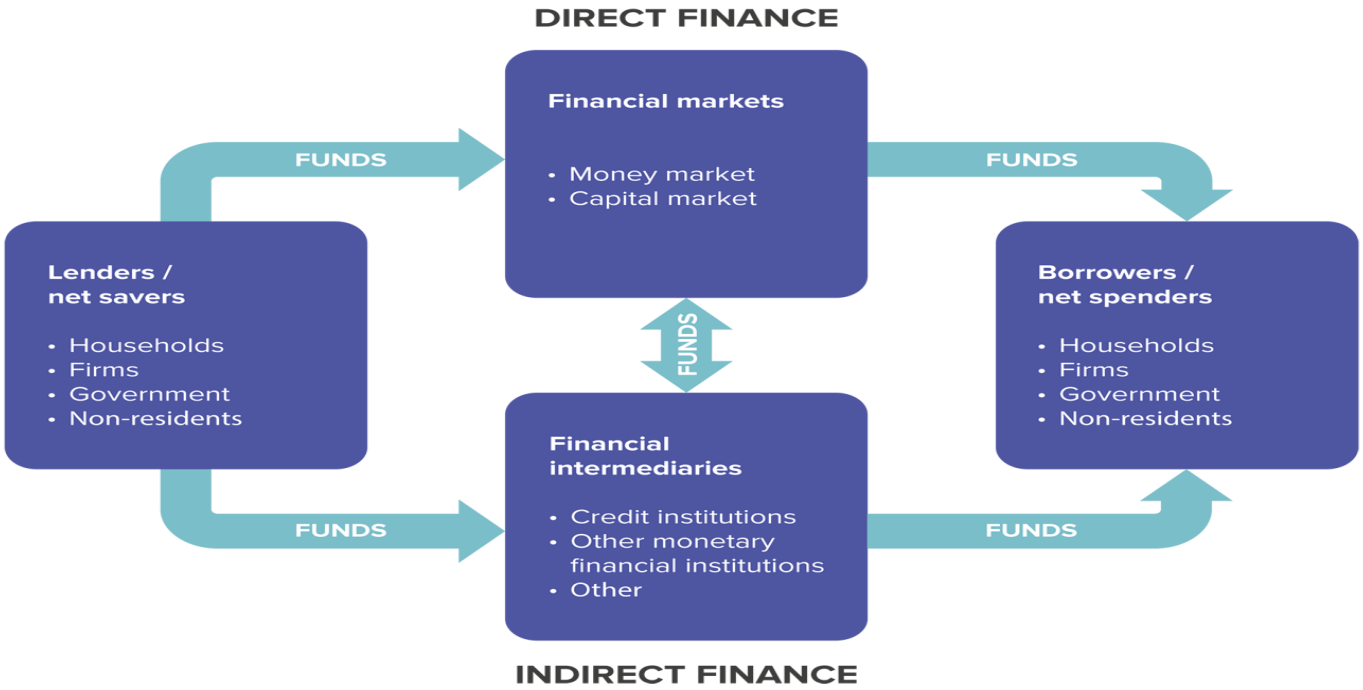
Direct finance



Banks & Markets: Introduction

- **Banks** are inextricably **linked to markets**.
- They obtain **funding from other banks via the interbank market**.
- Banks also manage their **short-term funding requirements by accessing money markets**.
- Traditionally banks have also been major operators in **trading short-term money market instruments.**
- Banks have also been the mainstay of the **foreign exchange market.**
- All this activity is undertaken so that **banks can manage their liquidity positions.**

Direct & Indirect Finance



Innovations in Intermediation

- **Innovation is result of search for profits**. A change in the financial environment will stimulate a search for new products and ideas that are likely to increase the bottom line.
- There are generally **three types of changes** we can examine:
  1. **Response to Changes in Demand Conditions**
  2. **Response to Changes in Supply Conditions**
  3. **Avoidance of Existing Regulation**

Banks' Responses

- **Loss of** cost advantages in raising funds and income **advantages** in making loans causes **reduction in profitability in traditional banking:**
- **Reaction?**
  1. **Expand lending into riskier areas (e.g., real estate)**
  2. **Expand into off-balance sheet activities**
- Creates **problems for U.S. regulatory system.**
- **Similar problems** for banking industry **in other countries.**

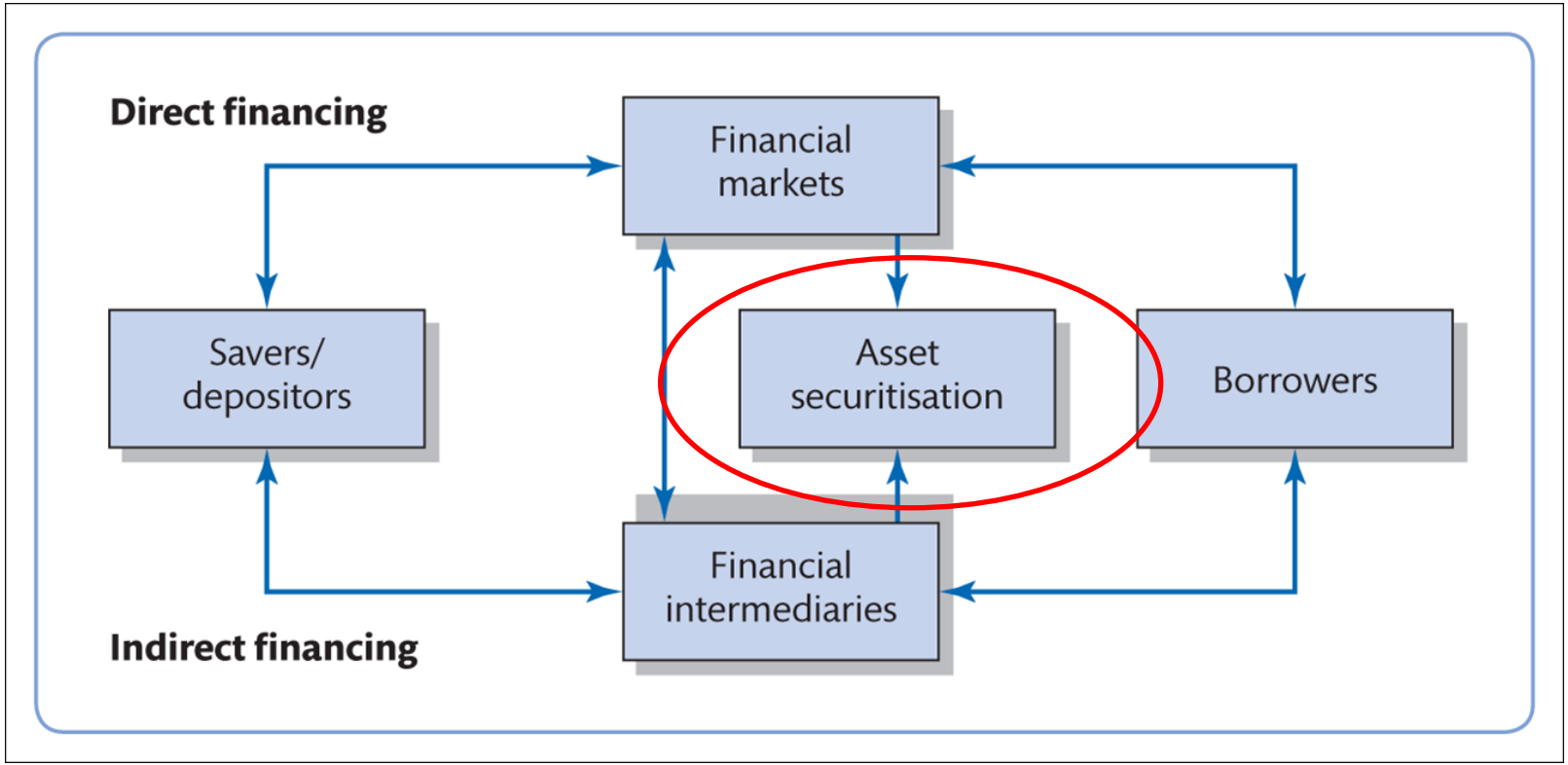
More Recent Developments

- **Banks' involvement in markets has increased dramatically.**
  - **Deregulation and consolidation**: The trend towards **universal banking.**
  - **Technological advances & financial innovation**: Easier to price and trade a broader array of complex financial products.
  - Increasing dependence on financial markets for **risk management (hedging) purposes**.
  - Emergence of **a complex web of interdependence between banks and markets.**

Shadow Banking

- **A distinct form of financial intermediation.** All activities related to:
  - **Credit intermediation**
  - **Liquidity** and
  - **Maturity transformation** that take place **outside the regulated banking system**.
- Examples:
  - **Mortgage-backed securities** (MBS) and **asset-backed securities** (ABS).
  - **Collateralised debt obligations** (CDOs) and **asset-backed commercial paper** (ABCP).

Modern Financial Intermediation



II. Modern Securitisation Process

US Mortgage Market Problems

- Long-term (since World War II) **rising US property values** – but had **developed into property 'boom'** from 02 to 07 (11% per year).
- **Higher interest rates contribute from 2007 to house price corrections and falls.** Rise in mortgage defaults – 2nd. Qtr., 2007 saw record of foreclosure procedures.
- Particular feature of recent housing boom was **expansion of mortgage loans to high risk borrowers (sub-prime).**
- Decent return for lenders (typically 2% more than fixed rate prime lending), taken into account risk, but **under the normal assumption that property values would continue to rise (which proved false).**

Sub-Prime & Securitisation

- Much (80%) of this **poor quality debt was included in bigger packages of collateralised securities** (or ‘asset-backed securities, ABSs; or ‘collateralised debt obligations’, CDOs) **of variable risk which were sold on to the market.**

BUT

- **Exact exposure of financial institutions to particular types of debt remained opaque.**

Sub-Prime & Securitisation (2)

- In general **securitisation relates to the pooling of credit-risky assets (typically mortgage loans, but later extended to other types of credit** with some form of **predictable cash flow**).
- These assets are **sold to a special purpose/ investment vehicles (SPV/ SIV) which issue securities (usually fixed income instruments) to finance the purchase of assets.**
- The **risk of the portfolio could further be improved by various credit enhancement techniques** (third party guarantees, overcollateralization etc).
- Securities **are rated by Rating Agencies.**

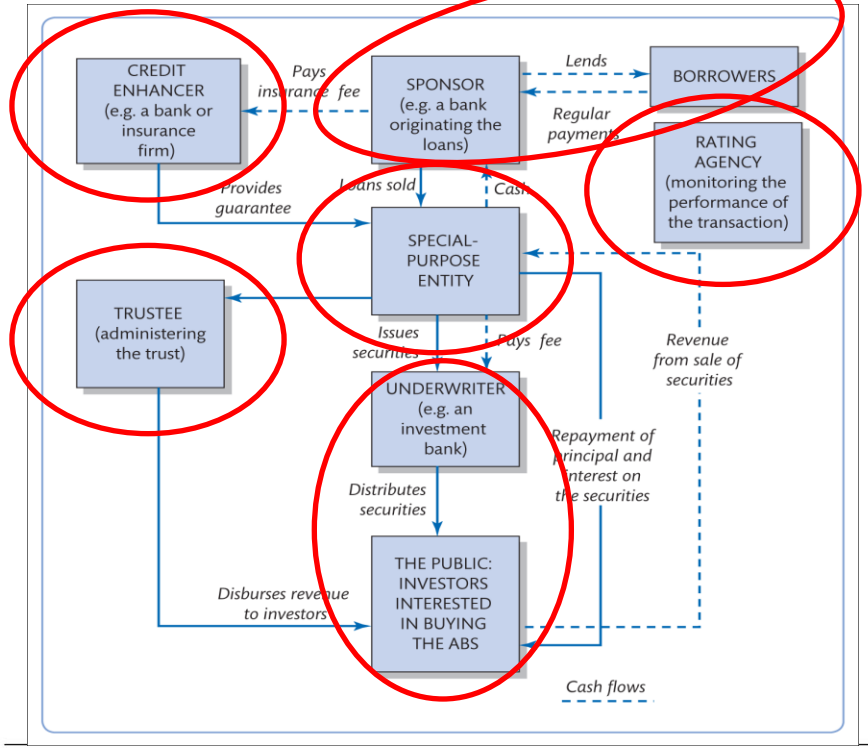
Securitisation Participants

- **7 main participants:**

1. **Originator:** the institution (bank) seeking to securitise its assets;
2. **Sponsor:** the institution that initiates the securitisation process. Sometimes the same as the originator; sometimes an agent earning a fee.
3. **Special Purpose Vehicle (SPV):** entity created with **the sole purpose of the transaction**. The SPV acquires the assets and issues its securities to investors; it is also called **'securitised product issuer'**;
4. **Underwriter:** an investment bank that markets, distributes and sells the securitised products issues by the SPV.
5. **Trustee:** impartial third party that monitors the whole deal;
6. **Custodian:** a party that holds the assets on behalf of the purchaser of the securitised products;
7. **Servicer:** a party that collects cash flow on assets and distributes it to either SPV or custodian.

Creation of an ABS Security

Creation of an ABS Security: Participants & Functions



- **Five stages:**
  - **Stage 1** - The originator makes the mortgage (or other types of) loans.
  - **Stage 2** - The **SPV** buys the mortgages (or other loans) from the originator in what is known as a **'true sale'**.
  - **Stage 3** - The **cash received from investors who buy the (credit-rated) securities issued by the SPV** is then passed **back on to the originator via the SPV**.
  - **Stage 4** - The SPV also **appoints a servicer to collect interest and principal payments** on the underlying loans.
  - **Stage 5** - **Two other key parties** to the transaction are **the trustee, who performs the function of ensuring that money is transferred from the servicer to the SPV and that investors are paid** in accordance and **the credit enhancer (or swap counter-party)**.

Structured Investment Vehicles

- SIVs proliferated in recent years; all major banks participating.
- They are the **means by which banks seek arbitrage gains between high yielding collateralised debt obligations and cheap rates on short-term commercial paper.**
- They **borrow short; lend long.**
- SIVs are **opaque**, **invest in complex securities** & do **not need be on bank's balance sheet.**
- They **purchase collateralised securities** (including sub-prime debt).

Structured Investment Vehicles (2)

- They raise money in Asset Backed Commercial Paper (ABCP) market (Short-term loans - few days to a few months duration (average maturity: 90 days).
- ABCP market **worth about $1,200b. by summer 2007** (3 times that of 2002).
- They are **called asset backed because they are backed by a pool of mortgages or other loans as collateral**.
- **If default? Owners of the asset-backed securities have the power to seize and sell the underlying collateral assets.**

Structured Investment Vehicles (3)

- If the originator (the bank making the loans) goes bust, there is **no recourse to the collateral (the underlying assets) held by the SPV** and **the servicer ensures that payments on the underlying assets continue to be made** and investors that have bought the securities from the SPV still **receive interest and principal payments**.

- In theory investors do **not have to worry about the risks the bank is taking in its lending activity**, all they have to worry about is t**he credit quality of the underlying assets held in the SPV**.

Structured Investment Vehicles (4)

- As the regulators classified such **SPVs as 'bankruptcy remote'** they were viewed as **legal structures that held low-risk pools of diversified mortgages (or loans)** and as such were **seen to be corporate structures containing high-quality collateral**.

- **Typical SIV assets = The size of large bank**

Structured Investment Vehicles (5)

- Contingency arrangements with (often parent) **banks to provide lines of credit when liquidity unavailable in the market**.
- Normally the sponsoring bank grants a credit line to the vehicle called a **“liquidity backstop”**.
- This **liquidity backstop usually provides 100% cover for ABCP of SIVs**.

Structured Investment Vehicles (6)

- Thus, **the strategy of SIVs exposed banks to funding liquidity risk**:
  - Investors might suddenly **stop buying asset-backed commercial paper, preventing these vehicles from rolling over their short-term debts.**
- During **anxiety over sub-prime market and collateralised securities**, and restriction in market liquidity, **many SIVs drew heavily on their bank's credit.**
- **Other financial vehicles – 'conduits' – differ in detail but similar in principle and effect.**

Credit Quality

- While the credit quality of individual loans in the underlying pool of assets may be low, the credit quality (and therefore the credit rating) of the overall portfolio held in the SPV can be increased by pooling the portfolio of risky assets so as to gain various diversification benefits.

Credit Enhancement

- In addition, the risks of the portfolio could further be improved by **various credit-enhancement techniques:**

1. **Over-collateralisation:** Holding a larger pool of assets than securities issued,
2. **Third-party guarantees:** Insurance cover to protect the value of assets,
3. **Subordination:** The process of prioritising the order in which mortgage loan losses are allocated to the various layers of bonds so that the lower-rated junior bonds serve as credit support for the higher-rated senior bonds.
4. **Excess spread:** Originators, namely banks, inject cash into the SPV that will bear certain early losses.

Tranching

- Tranching of the liabilities of the SPV **allow that different types of securities with varying risk and maturity features** can be offered to meet varying investor demand.
- Typically **three tranches:**
  - **Senior:** Debt. Least risky with the highest credit ratings, typically AAA and AA
  - **Mezzanine:** Debt. Rated usually BBB and below
  - **Unrated:** Equity. The **most risky tranche** of the securitisation deal and is commonly **retained by the originating bank on its balance sheet**.
- **While all tranches are backed by the same assets, if some of these go bad (default) the highest risk tranche the first to suffer losses.**

Sub-Prime & CDOs

- Collateralized debt obligations (CDOs) **form a new stage of the securitization process.**
- **CDO issuers purchased different tranches of Mortgage Backed Securities (MBS) and pooled them together with other ABS.**
- While **in an MBS the underlying pool of assets was actual mortgages**, in the case of **CDOs the assets were securities that received mortgage payments**.
  - **CDOs**, therefore, can be viewed as **re-securitised securities**.
  - So-called **'two-layer'** or **'double leveraged'** securitisations in which **structured products were used to fund other structured products.**

Sub-Prime & CDOs (2)

- Collateralised **securities packages credit rated by S&P, Moody's, etc. and sold on to world's financial institutions.**
- The creation of CDOs **made even more difficult to evaluate the risk and prices of these instruments** when the subprime market collapse.
- Attraction of collateralised and structured products? **Product can be tailor-made to meet requirements** (e.g. degree of risk, maturity) of investor by varying mix of products.
- **Theoretically, the varied mix should reduce risk, for a given return.**

Sub-Prime & CDS

- A **credit default swap (CDS)** is **insurance against default on a financial instrument**, usually some kind of securitized bond.
- Typically, the **holder of debt will buy a CDS** from an investment or insurance company, such as AIG, **to shift the risk of default to a third party**.
- Buyers receive pay-outs from sellers on a credit event of a particular entity, and in return pay premiums to sellers.
- However, **buyers do not have to have an interest in the entity**, and such **"naked" CDS** have become an **efficient way of shorting** bonds.

Sub-Prime & CDS (2)

- When the probability of default is low, the cost of the CDS is similarly low.
- **By lowering the risk of these insured bonds with default insurance, the market price of the bonds would increase.**

Sub-Prime & CDS (3)

- Between 1995 and 2009 the amount of CDSs exploded, along with the marketing of securitized mortgages.
- By their peak in 2008 there were app. **$62 trillion of CDSs outstanding** (the **global GDP is app. $60 trillion**).
- Since most players in the market did not anticipate the collapse of the real estate and mortgage bond markets, **few saw great risk in the CDSs** being issued around the world.
- One reason for the growth was that there was **no real regulatory restraint**.

Sub-Prime & Crisis

- From early to mid-2007, **a wave of defaults accumulated in the US** Subprime mortgage market and property prices began to fall.
- **As the value of the collateral declined, investors realized that their investments were rapidly evaporating.**
- The complexity of the structured products meant that became **almost impossible to value the securities as it was virtually impossible to accurately value the underlying collateral.**
- **Securities that had been rated as low risk and investment grade by the rating agencies became speculative and unsaleable.**
- **Liquidity dried up:** Near bankruptcy and $182 billion bailout of AIG.

Sub-Prime & Crisis (2)

- **EU Task Force (2010):**
  - No conclusive evidence that developments in the CDS market cause higher funding costs for member states.
- **Calice, Chen & Williams (2013):**
  - Prior to the crisis, spreads of bond yields determined CDS spreads, but **during the crisis CDS spreads led bond yields**.
  - For Ireland, Greece, Portugal and Spain, **the transmission effect from the CDS market to bond spreads was large and significant**.
  - **"Explosive trends"** emanating from the CDS market, without official intervention, would have resulted in complete sovereign debt **market failure**.

Sub-Prime & Crisis (3)

- **Aizenman, Hutchison & Jinjarak (2013):**
  - Actual CDS spreads were even **higher than those predicted**,
  - Ratios ranging from Ireland 1.3, Italy 1.4, Spain 1.9, Portugal 2.8 and Greece 3.3.
  - ***"The extraordinarily high CDS spreads in [the peripheral economies] in 2010 may be attributed to excessive pessimism and an overreaction to the fiscal deterioration"*** (though theoretically it might instead reflect future fundamentals).
- Buyer pressure excessive in relation to the economic fundamentals on CDS spreads can have explosive effects **necessitating intervention - bail-outs, support or purchases of sovereign bonds**.

The Role of Credit Rating Agencies

- Role of CRAs (e.g. Moody's, Standard & Poor, Fitch) has been **widely criticised.**
- **To assure investors** that the ABS or MBS are of a high quality, the **SPVs require the credit-rating agencies to rate these securities to reflect the credit risks of the pools of assets backing these securities**.
- While the credit **quality of individual loans in the underlying pool of assets may be low**, the credit quality (and therefore **the credit rating**) **of the overall portfolio** held in the SPV can be increased by **pooling the portfolio** of risky assets so as to gain **various diversification benefits**.

The Role of Credit Rating Agencies (2)

- They **focused on the value of specific products & failed to take account of the dangers of a systemic problem** (e.g. a general fall in house prices).
- In reality **CDOs spread risk to many institutions, rather than offsetting risk.**
- Criticism of banks' internal risk assessment - they **should not have accepted CRAs' ratings so readily.**

The Role of Credit Rating Agencies (3)

- Brunnermeier (2009) suggests that:

  'Structured products seemed …attractive to investors who took ***credit ratings at face value & ignored the fact that structured products receive a more favourable rating compared to corporate bonds****…[and that] rating agencies collect the highest fees for structured products up front.'*

- Acharya and Richardson (2009):

  'we believe that the rating ***agency' role in marketing asset-backed securities can be overestimated as a factor in the crisis, because, in fact, investors were not the chief purchasers of these securities: banks themselves were'****.*

QUESTIONS?

THANK YOU!