Essex EC248-2-SP
Lecture 8

Financial Innovations:
Off-Balance Sheet
Activities of Banks

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Plan of Talk

- **Introduction**

1. Financial Innovation: Rationale and Types
2. Off-Balance Sheet Activities
3. Financial Guarantees
4. Hedging
5. Financial Derivatives
6. Securitisation
7. Other Off-Balance Sheet Activities

- **Wrap-up**

Aims and Learning Outcomes

- **Aim**
  - Discuss the various off-balance-sheet activities of banks as a recent and expanding form of financial innovation
- **Learning outcomes**
  - Justify and analyse the process of financial innovation
  - Distinguish the main types of financial guarantees
  - Understand the role of hedging
  - Compare the principal financial derivatives
  - Describe the process of securitisation

Financial Innovation: Rationale and Types

- Occurs from the search for (increasing) **profits** as business objective of financial firms
- Especially when stimulated by **changes** in the financial environment, which may arise
  - in *demand* conditions
  - in *supply* conditions, and/or
  - from avoidance of (new) *regulation*
- *Accordingly*, ***one way*** **to classify** financial innovation is in **three types**
  - **(a.i)** response to *changes in* ***demand*** *conditions*: e.g., adjustable-rate mortgages, financial derivatives
  - **(a.ii)** response to *changes in* ***supply*** *conditions*: e.g., bank credit and debit cards, electronic banking, junk bonds, commercial paper, securitisation
  - **(a.iii)** response to *changes in financial* (or tax and other related) ***regulations***: e.g., money market mutual funds, sweep accounts
- An ***alternative*** **classification** is in **two types**, according to a rather *functional* criterion
  - **(b.i) electronic banking**
    - *retail* services: e.g., online banking, various smart cards, ATMs
    - *large-value* transfer systems: e.g., CHIPS, SWIFT
  - **(b.ii) off-balance sheet activities**
    - financial *guarantees*: e.g., standby letters of credit, bank loan commitments
    - financial *derivatives*: e.g., swaps, options, futures, forward contracts
    - (other) financial *services*: e.g., cash management, investment products, private banking, trust operations

Off-Balance Sheet Activities of Banks

- ***Increased* market risk** => increased volatility of *profits* due to
  - Sharp fluctuations in interest rates in industrialised countries in the 1980s
  - Low and stable interest rates, but turmoil in emerging markets in the 1990s
  - Hence, much more risk when doing business in global financial markets
- Banks may ***reduce* market (interest rate) risk by**
  - Dollar gap management and/or duration gap management *on B/S*
  - Insuring, hedging or transferring it, often by *off-B/S activities*
- **Off-balance sheet activities**: ***financial innovations*** that involve *commitments* related to *contingencies* and generate *fees* (from financial *services*) – claims do *not* appear on B/S until *exercised* (if at all)
  - 2 broad categories
    - **financial guarantees**

      commitments based on a **contingent claim**: an obligation by a bank to provide funds (lend funds or buy securities) **if** a *contingency* is realised
    - **derivative instruments**

      commitments "deriving" from an **underlying financial contract**
  - Transforming deposit/lending institutions into *risk management* institutions
  - Tremendous *growth* of off-balance sheet activities of large banks

Financial Guarantees: SLCs

- **Financial guarantee**

  the bank *stands behind* an obligation of an *account* partner to a third party

- ***Standby* letters of credit (SLCs)**
  - Obligate the bank – for an upfront and annual *fees* – to pay the beneficiary if the account party *defaults* on a financial obligation or performance contract
  - Comparable to an over-the-counter *put* option written by the bank (i.e., the firm can "put" the credit obligation back to the bank)
    - *financial* SLCs: *backup* lines of credit on bonds, notes, and commercial paper which serve as guarantee, e.g. issued by a city and repaid from project users
    - *performance* SLCs: guarantee completion of construction contracts before a given *date*; similar to surety bonds issued by insurance companies to insure against loss/damage
  - Considered as contingent *loans*, may be collateralised or backed by deposits
  - Contingent *risks* – liquidity risk (also called funding risk or quantity risk), capital risk, interest rate risk, and legal risk – are inherent in SLCs
  - *Material adverse change (MAC)* clause that enables the bank to *withdraw* its commitment if the risk of the SLC changes substantially

Financial Guarantees: Loan Commitments

- **Promise** by a *bank* to a *customer* to make a future loan(s) under certain *conditions*
- Most *commercial* and *industrial* loans are made under some form of loan commitment (informal or formal)
  - ***Line of credit*****:** *informal* commitment to lend funds to a client firm => *no* fee
  - ***Revolving loan commitment*****:** *formal* agreement to lend funds on demand to a client firm under the terms of the contract, MAC clauses may be used
    - customer pays the bank a commitment (or facility) *fee*
    - protect firms /borrowers/ from *availability* (of credit) risk and from *markup* (or *premium*) risk, by *fixing* it, but the bank /lender/ is exposed to interest rate risk
    - *funding* (or *quantity*, or *liquidity*) *risk* is the *major* risk
      - many borrowers taking down commitments *at the same time*
      - most likely to occur during periods of *tight credit*
- Some commitments are **irrevocable**, i.e., *unconditional* and binding

Financial Guarantees: NIFs

- NIFs = Note Issuance Facilities
- *medium-term* (2-7 years) *agreements* in which a bank **guarantees** the *sale* of a borrower's *short-term debt securities* (e.g. negotiable promissory notes) at or below *pre-determined* interest rates
- **synonyms** to NIFs
  - *revolving underwriting facilities* (RUFs)
  - *standby note issuance facilities* (SNIFs)
- if a borrower cannot readily obtain short-term funds, the bank will **buy** the securities
  - *bank* borrowers usually seek issue of CDs, called a *Roly-Poly CD facility*
  - *nonbank* borrowers seek issue of *Euronotes* (denominated in US dollars at par > $500'000 but sold outside of the US), called *Euronote* facilities or also *note purchase* facilities, *multiple component* facilities, *transferable* RUFs (TRUFs)
- contingent **risks** to banks here as *underwriters* (i.e., *arrangers* if a single bank or *tender panel* if a group of banks) are credit risk and funding risk

Financial Derivatives: Overview

- **Financial derivatives** = financial instruments
  - "derived" from an *underlying* (existing) financial instrument/contract
  - major types: swaps, forward contracts, futures, options, securitised assets
- **Most** derivatives *activities* are reported **on** the balance sheet
  - those with *positive* values are counted as assets
  - and those with *negative* values as liabilities
- But **some** derivatives *activities* are **off**-balance sheet
- *2 types* of **derivatives markets**
  1. *organised* exchanges: CBOT, CME, CBOE, TIFFE, Eurex, Euronext
  2. privately traded *over-the-counter* (OTC) market 24 hours a day
- *Regulators* (including the Commodity Futures Commission, SEC, Federal Reserve, OCC, and FDIC) are very concerned with **derivative exposures** of banks (e.g., liquidity, fraud, human risks)

Financial Derivatives: Swaps

- First **developed** in Europe in 1981, appeared in US in 1982
- **Agreement –** usually, b/n 2 counterparties – to *exchange* (swap)
  - *cash flows* (i.e. set of payments, not assets) based upon specified
  - *notional principal* (amount of money), maturity (period), and interest rates
- **Types** of swaps
  1. *Interest-rate* swaps: exchange of *interest* payments
     1. *Coupon* swaps: *fixed*- for *floating*-rate coupon payments

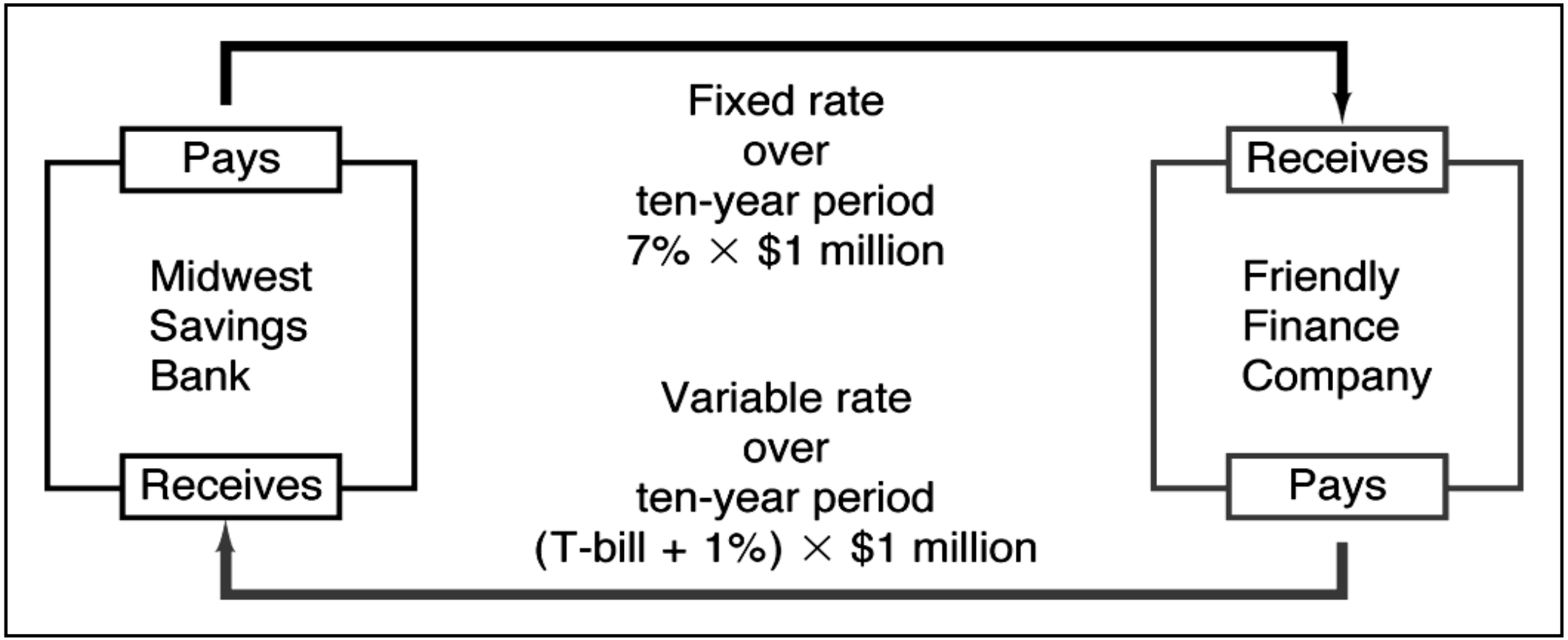
     "plain vanilla" interest-rate swap: the most common ("classic", "generic") type
     - No actual transfer of principal, *only* interest payments on debt contracts
     - Useful in managing interest rate *gap* problems in banks and nonbank firms

     2. *Basis* swaps: two different *floating* rates of interest

     3. *Cross*-currency swaps: 3 counterparties, whereby *interest* payments b/n A and B are *fixed* and b/n A and C are *floating* but in different *currencies*

     "plain deal" currency swap: 2 counterparties, *equal* interest payments but different currencies
  2. *Currency* swaps: exchange of payments in two different *currencies*
- Heavily **used** in the *OTC* market, with large banks dominating it

“Plain Vanilla” Interest-Rate Swap



1. **Notional principal of $1 million**
2. **Term of 10 years**
3. **Midwest SB swaps 7% payment for T-bill + 1% from Friendly Finance Co.**

Financial Derivatives: Hedges/Forwards

- **to hedge =** to engage in a financial transaction that *reduces or eliminates* risk
- **basic hedging principle**

  Hedging (risk) involves engaging in a financial transaction that **offsets** a *long* position by taking an additional *short* position, *or* **offsets** a *short* position by taking an additional *long* position

  ***long* position** = agree *to buy* securities at future date at a *predetermined* price

  Hedges by locking in future interest rate (hence, price) *if* funds coming in future

  ***short* position** = agree *to sell* securities at future date at a *predetermined* price

  Hedges by reducing price risk from change in interest rates *if* holding bonds
- **interest-rate forward contract, as a "classic" hedge**
  - future sale/purchase of a debt instrument: e.g., the 8s of 2023 TBonds
  - pricing and delivery occur at two points in time
  - ***pros***
    1. Risk-reducing (risk-eliminating)
    2. Flexible: parties free to agree on a suitable (nonstandardised) contract
  - ***cons***
    1. Lack of liquidity: hard to find counterparty
    2. Subject to default risk: requires information to screen good from bad risk

Financial Derivatives: Futures

- **Developed** in 1975 at CBOT, to *overcome* deficiencies of forwards
- Futures **contracts** are, in essence, very *similar* to forward contracts
- But they *differ* in the following **features**
  - *Standardised* in terms of quantities ($ 100'000) and delivery dates (end-quarter)
  - Traded on *organised* exchanges like CBOT
  - Exchange *clearinghouse* as a counterparty to each contract: lowers default risk
  - *Margin* = a small commitment of funds ($2000 per contract): smooth performance
  - *Marking-to-market* at the end of each day: accounts for a *closing* price at the end of the trading day (*settlement* price) different from the contracted price earlier during the day: e.g. from 115 to 114 => buyer loses *1 point* = $1000, adds to margin, if below the maintenance margin requirement (lower than the initial one)
- **Success** of futures over forwards
  1. Futures *more liquid*: standardised, can be traded again, delivery of a range of TBonds with maturities longer than 15 years (not just a specific TB) permitted
  2. Delivery of a *range* of securities also prevents anyone "cornering" the market
  3. Mark to market and margin requirements: *avoids default risk*
  4. Don't have to deliver physically: *netting* (long and short position of same trader)

Financial Derivatives: *Standard* Options

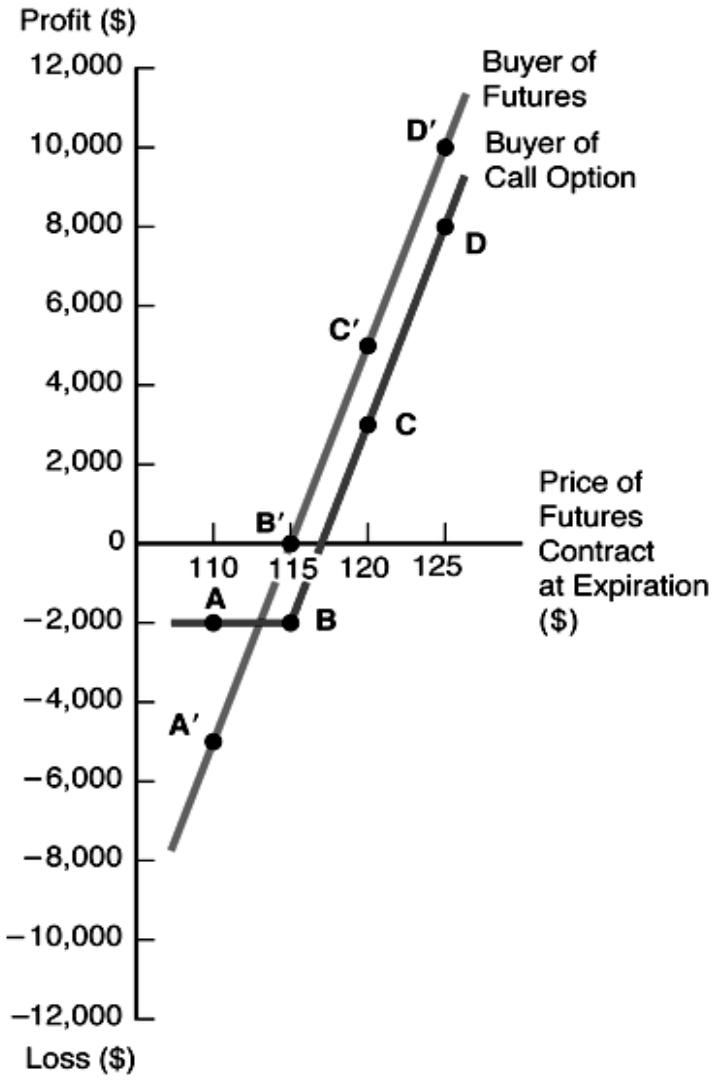
- **Right but not obligation** to buy or sell at a *specified* exercise ("strike") price *on* (*European* option) or *before* (*American* option) a *specified* expiration date
  - *Call* option = right to *buy*: option buyer (owner) pays "premium" to option seller (writer) for this right
  - *Put* option = right to *sell*: buyer pays "premium" to seller for this right
    - Seller of option **must** buy or sell as arranged in the option, so the seller gets a premium for this risk
    - The premium is the *price* of the option
    - The *Black-Scholes* option pricing model can be used to figure out the premium (or price) of an option
  - *Long* position: buyer, who gains if the price of the option increases
  - *Short* position: seller, who earns the premium if the option is not exercised (because it is not valuable to the buyer of the option)
- Hedging with (futures) options

  Buy *same* number of put option contracts as would sell of futures

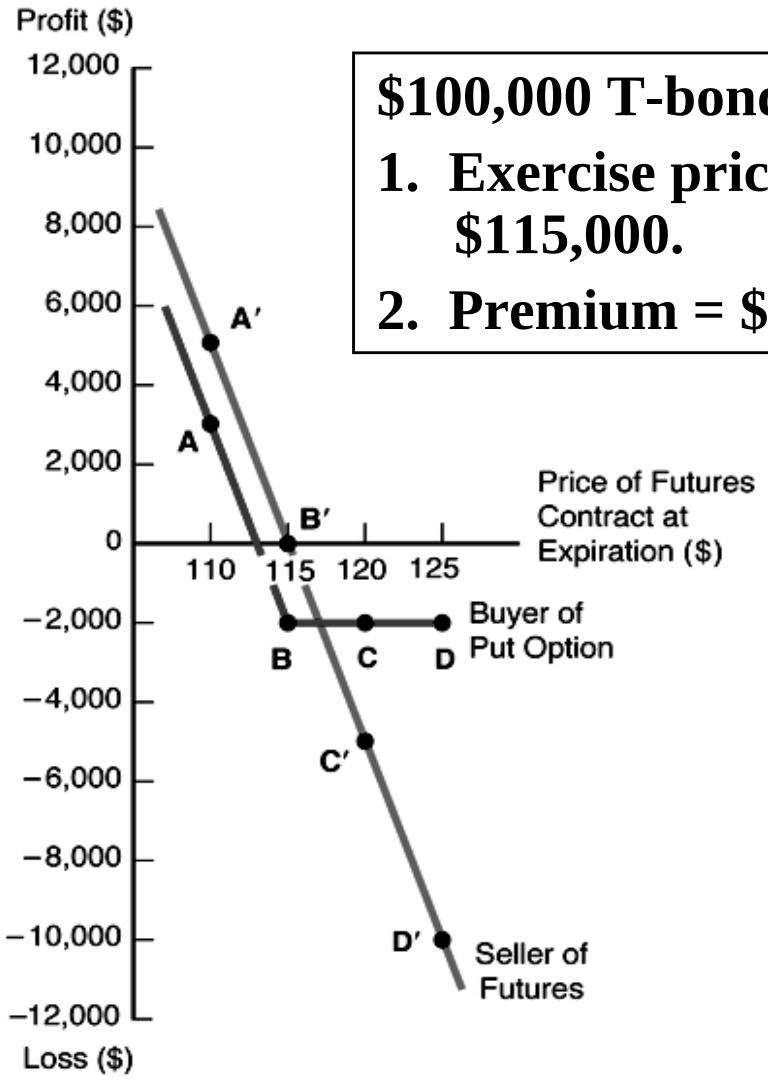
  Disadvantage: pay premium

  Advantage: protected if $i \uparrow$, gain if $i \downarrow$

Profits and Losses: Options vs Futures



(a) Profit or loss for buyer of call option and buyer of futures



(b) Profit or loss for buyer of put option and seller of futures

$100,000 T-bond contract,

1. **Exercise price of 115, $115,000.**
2. **Premium = $2,000**

Financial Derivatives: *OTC* Options

- *Nonstandardised* contracts, unlike exchange-traded options
- *No clearinghouse* to act as a safety net
- **Types**
  - **Floor-ceiling agreements**

    Ceiling agreements (*caps*): Sets the *max* interest rate on a loan to protect the *customer* from interest rate risk. The bank pays the firm the interest above this ceiling. As such, the bank is the writer of a call option in interest rates (or, alternatively stated, a put option in prices).

    Floor agreements: Sets a *min* lending interest rate on a loan to protect the *bank*. The bank is a buyer of a put option in interest rates in this case (or, alternatively stated, a call option in prices).

    Interest rate collar: Combines a cap and floor agreement to set *max and min* interest rate limits on a loan.
  - **Credit risk derivatives**

    Credit option: for example, an investor buys an option that pays the loss in bond value due to an agency rating downgrade on a bond

    Total return swap: for example, bank A swaps payments on a risky loan portfolio for a cash flow stream tied to LIBOR plus some compensation for the credit risk premium that it has given up (i.e., credit risk transfer)

Financial Derivatives: FRAs and Synthetic Loans

- **FRAs** = Forward Rate Agreements
  - OTC *interest-rate* futures contract for bonds or other financial asset
  - *Not* traded on organised exchanges as financial futures contracts are
  - *Tailored* to meet needs of parties involved
  - *Not* marked to market daily, so little liquidity risk, as with futures contracts
- **Synthetic loans**: use *interest-rate* futures and options to create synthetic loans and securities
  - Suppose a *firm* believes interest rates will fall in the near future
  - It borrows $30 million for 120 days on a *floating* rate basis (repriced every 30 days at the CD rate plus 4 percentage points)
  - But the *bank* would prefer to make a *fixed* rate loan in this interest rate environment
  - To convert the variable rate loan to a fixed rate loan, the bank could buy T-bill *futures*
  - If interest rates fall, and T-bill prices rise, the gain on the futures position would *offset* the lower interest earnings on the cash loan position

Financial Derivatives: Securitisation

- Definition
  issuance of a debt instrument in which the promised payments are derived from revenues generated by a defined pool of loans
  i.e., packaging of loans into large pools and issuance of securities to investors who earn returns based on repayments on the loans
- Evolution
  - initially (since 1985 in US): home loans, auto loans, credit-card receivables, computer leases, mobile home loans, and small business loans
  - more recent (since 1998 in US) securitisation of collateralised commercial and industrial loans
    - *collateralised loan obligations* (CLOs)
    - *commercial mortgage-backed securities* (CMBSs)
- Allows banks to
  - *transfer loan risks* into the financial marketplace: reduce credit risks, gap risk, improve diversification, and provide stable, low-risk service revenues
  - *earn service revenues* for being loan originator, loan packager and/or loan service company
- Securitised assets are counted as **off-B/S items only if**
  they have been **transferred *with recourse***,
  i.e. the *bank* is still exposed to *risk* associated with the underlying asset
    - securitised home loans are *not* off-B/S assets: mortgage-backed
    - securitised credit card loans can *still* expose the bank to credit risk: if credit payments fall below some predetermined level, it is obliged to repurchase

Other Off-Balance Sheet Activities (I)

- **Loan sales**
  - Banks can sell loans to a third party as a source of funds: for a *fee* the selling bank often continues to service the loan payment
  - With or without recourse sales, where *recourse* means the selling bank *retains* some of the credit risk
  - Allow banks to make loans *without relying on deposits* and converts traditional lending to a quasi-securities business
  - On the other hand, other buying institutions become *more like banks*
- **Cash management**

  Lock box services (post office boxes to *collect customer revenues*) earn *fee* income
- **Networking**

  linkages between firms based on *comparative advantages*, otherwise known as a **strategic alliance**

  E.g., a bank may *refer* a customer to a brokerage firm and earn part of the customer fee

  Also, placement of *branch offices* in supermarkets and other retail stores

Other Off-Balance Sheet Activities (II)

- **Trade finance**
  - *Some* international aspects of trade finance are off-balance sheet

    Commercial letters of credit: a letter of credit issued by a bank as a guarantee that the bank's customer will pay a contractual debt => banks bear credit risk and documentary risk (i.e., complexity of intl commerce)
  - *Acceptance participations*

    Bankers' acceptance: a bank accepts a time draft (bill of exchange) normally covering the sale of goods and agrees to pay its face value at maturity

    Acceptance participations: some banks then sell acceptance participations for all or part of the draft
- *Some* ***foreign exchange*** **trading/hedging** activities are off-B/S
- ***Advisory*** **and** ***management*** **services** that earn service *fees*: fairly riskless

Concluding Wrap-Up

- **What have we learnt?**
  - What drives the process of financial innovation and which are its main types
  - Why off-balance sheet activities emerged and developed
  - How financial guarantees differ from hedging strategies
  - What the principal financial derivative instruments are
  - How to compare related types of futures and options
  - What is meant by securitisation
- **Where we go next:** to nonbank finance and electronic money as forms of financial innovation