

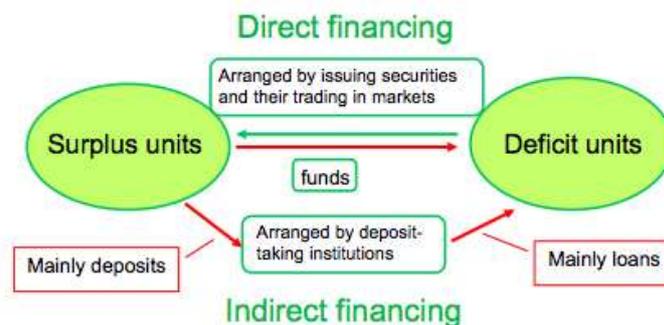
## 25556 – The financial system:

### Lecture 1:

- A financial system consists of financial institutions, markets and instruments that together provide financial services for the economy
  - Their major tasks are known as financial functions
- The way in which financial services are provided changes and improves over time – this is known as financial innovation
- 6 Main financial functions:
  1. **The settlement of transactions** – the arrangements that can be used to settle commercial transactions
  2. **The flow of funds** – the supply of funds from surplus to deficit units
  3. **Risk management (risk transfer function)** – helps to manage default and market risk
  4. **To overcome information asymmetry** – a situation where one party to a potential contract is better informed than the other party
  5. **To resolve incentive problems**
  6. **To pool funds**

#### **Settlement:**

- Settlement of financial transactions occurs when a buyer exchanges value (usually money) for a purchased item
  - Performed by payments system
- The settlement function is performed by the payments system
  - It comprises the instruments that are used to settle transactions
  - These include notes and coins and payment orders (such as the instructions made with debit cards) and the systems that enable them to be treated as money
- Owners of funds are called surplus units
- People who need funds are called deficit units
- There two basic methods:
  1. Direct financing where surplus units pay for securities issued by deficit units and this is mainly arranged through financial markets,  
or
  2. Indirect financing where financial institutions (mainly banks), raise funds from surplus units and supply funds to deficit units



#### **Risk:**

- Risk is the chance (or probability) that an expected return will not be achieved
  - Default risk is the chance/probability that financial obligations will not be met
  - Market risk is the probability of loss arising from random movements in a market variable (such as interest rates, exchange rates or share prices)
- Risk transfer is the use of contracts to manage risk exposure

#### **Information asymmetry:**

- Information asymmetry arises when one party to a potential contract is better informed than the other party

- Two problems can arise
  - Loans are made that should not have been made (if both parties had equal information),
  - Loans are **not** made that should have been made (if both parties had equal information)
- Information asymmetry is overcome through:
  - Including provisions in contracts (such as mortgages in home loans) that encourage truthful information disclosure
  - Restricting participation in the market to professional traders who are well informed about risks and potential returns, or
  - Financial regulations that require the more informed party to provide relevant information to the less informed supplier of funds

### Incentive problems:

- Incentive problems arise when the terms of a financial arrangement provide one party (or both) with an incentive to act irresponsibly. They can pose moral hazards
- Moral hazard is a situation where the 'self interest' of a party in a financial arrangement is in conflict with moral or ethical values

### Pooling:

- Pooling is the process of combining small amounts from many suppliers of funds for lending or investment purposes
  - Enhances the flow of funds

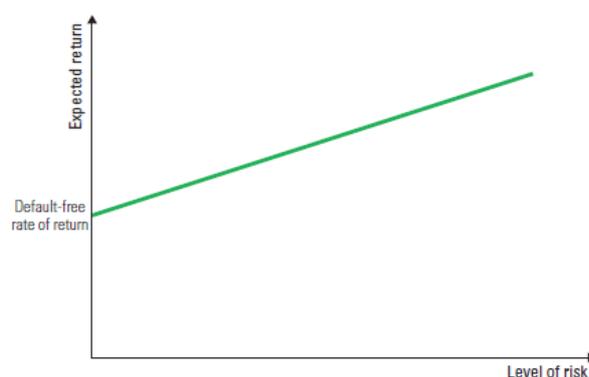
### Forms of finance:

- Debt and equity
- The level of the returns promised by the deficit unit to the surplus unit will reflect
  - the risks posed to the surplus unit
  - and the ease with which the surplus units can get their funds back
    - i. This is referred to as liquidity
- Debt finance:
  - Arranged through loan (interest, repayment date and security)
  - The three commonly used loan structures are:
    - i. The loan is repaid with interest on the agreed date
    - ii. Regular interest payments during the loan with the principal repaid at maturity (known as a term loan)
    - iii. Regular payments that cover interest and loan repayments (known as a reducible loan)

### Interest rates:

- An interest rate is both the return to the supplier of funds and the cost of debt funds to the borrower
- A fixed-rate applies for the full term of a loan whereas a floating-rate can change during a loan's term (such as monthly or quarterly)
- Interest rates can be viewed as the default-free rate plus a risk premium to compensate the risk of default
  - Borrowers pose credit risk (a form of default risk)
  - $R = r \text{ (default-free)} + r \text{ (risk premium)}$

Figure 1.3 The risk and return relationship



### Equity:

- Equity refers to the funds invested in a firm by its owners.
  - It is raised through a company issuing ordinary shares and can be increased through the company's retained earnings
  - Dividends are cash returns to shareholders
- It is referred to as 'risk capital' because its suppliers have the lowest payment priority, for example
  - Dividends can only be paid from earnings, which are the residual after a company has met its financial obligations
  - As they face greater risks, equity holders generally require higher expected rates of return than debt holders

	Advantages	Disadvantages
Debt	<ul style="list-style-type: none"><li>• Lower cost, partly because interest payments are tax deductible</li><li>• Leverage can increase return on equity</li></ul>	<ul style="list-style-type: none"><li>• Risk of insolvency</li><li>• Funding risk</li><li>• Potential loss of secured assets</li><li>• Forced asset sales may not achieve fair values</li></ul>
Equity	<ul style="list-style-type: none"><li>• Does not require repayment</li><li>• Not obligated to pay dividends</li><li>• Lowers risk of insolvency</li></ul>	<ul style="list-style-type: none"><li>• More expensive</li></ul>

### Two principals of finance:

- The risk/return trade-off
  - Expected returns are positively related with risk
  - Money has **time value** – which is the accumulation of interest over time.

### Main financial institutions:

- Banks (Authorised deposit-taking institutions = ADIs)
- Insurance companies
- Fund managers

### Banking:

- The main forms of banking services are:
  - Accept deposits, make loans and provide payment services for households (retail banking) and/or large companies (wholesale banking)
    - Most ADIs provide these services
  - Issuing securities and risk-transfer instruments and providing financial advice to large companies (these are the main forms of investment banking services;
  - They are provided by the larger ADIs as well as merchant banks (which are not ADIs and so are known as non-banks)

### Financing markets:

- Direct:
  - The **money market** that arranges trading in short-term 'discount' securities
  - The **bond market** that trades long-term securities known as bonds
  - The **share market** that arranges trading in corporate securities, such as shares

### Financial regulators:

- *RBA* – implements monetary policy, regulates payments system, overseas financial system stability
- *APRA* – Australian Prudential Regulation Authority – supervisor of financial institutions
- *ASIC* – Australian Securities and Investments Commission – enforces company and financial services law
- *Australian Treasury* – advisors the government

## Summary:

- Financial functions
  - ✓ settlement, flow-of-funds, risk transfer, overcoming information asymmetries, overcoming incentive problems, pooling of funds
- The basic forms of finance
  - ✓ debt and equity
- Australia's financial institutions and markets
  - ✓ ADIs, Insurance companies, fund managers
  - ✓ money, bond, shares, foreign exchange, futures and options markets
- Financial regulators
  - ✓ RBA (monetary policy, payments system and financial system stability)
  - ✓ APRA (prudential supervision)
  - ✓ ASIC (company and financial services law)

## Lecture 2:

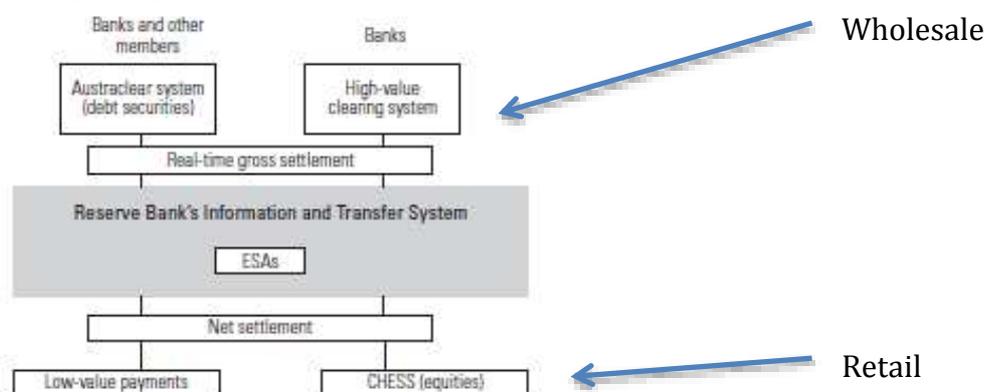
### The settlement function:

- It is performed by the payments system
- It has evolved from
  - barter to
  - precious metal to
  - coins and notes to
  - **payment orders**
- There are two main systems for processing payment orders
  - Deferred net settlement (**DNS**), which processes retail payment orders
  - Real-time Gross Settlement (**RTGS**), which processes wholesale payment orders

### Who are the participants?

- DNS – processes and settles payment orders by individuals and firms
  - accept deposits (from individuals and businesses) on which payment orders (such as debit cards as opposed to notes and coins) can be drawn
  - The RBA and its Payments System Board, which is responsible for the stability and efficiency of the payment system
  - Exchange settlement accounts (ESA), which each ADI has with the RBA, and the funds in them (ES funds), are settled by 9am the next morning.
- RTGS – processes payment orders used to settle large financial market transactions and to transfer funds between ADIs and the RBA
  - Financial market dealers and the markets' clearinghouse
  - RBA and its computer software known as RITS
  - The ES funds in the ESAs of ADIs

Figure 2.1 The wholesale payments system



Source: RBA (March 2004), 'The Australian high-value payments system', *Financial Stability Review*, p. 40.

- **Value of payments** – Retail: \$55b, Wholesale: \$165b
- **Number of payments:** - Retail: 24mill (excluding cash), Wholesale: 30,000

**ESAs:**

- These are accounts each ADI has with the RBA
- They handle payments between ADIs
  - ADIs transfer funds between themselves (meaning between their ESAs) when settling their customers' payment orders
    - In both the DNS and RTGS systems
    - Payments between ADIs and the RBA
- An ESA can not be overdrawn
  - This means they must always have a positive balance
  - The balance earns the **cash rate** less 25 basis points (bps)
- ES funds represent cash since they can be used to instantly settle payment orders

**Retail payments system:**

- It comprises notes & coins and payment orders that are used to settle transactions
- Payment orders are instructions that draw on funds held with ADIs
- The main retail payment orders are
  - **Direct entries** (credits and debits) – payment orders that automatically debit charges to an account or automatically credit payments to a credit card
  - Debit and credit cards
  - Cheques
- Each must be **authorised** and **verified**
  - You authorise your ADI to settle your payment order (with funds in your account) once the ADI has verified your instruction
- All retail payment orders that require an inter-ADI transfer are processed via the DNS system

**DNS:**

- Each business day around 24 million payment orders are used to settle transactions
  - They mostly require funds to be transferred between ADIs (where the payer and payee have different banks)
- They are cleared after they have been deposited
  - This requires each ADI to agree on the net transfers of ES funds between each other
- The net amounts agreed to are settled at the start of the next business day at the RBA by the transfer of the cleared net amounts of ES funds (i.e. settlement is deferred until 9am the next morning). This is therefore known as deferred settlement.
- Thus DNS exposes 'receiving' ADIs to settlement risk
  - The risk that a 'paying' ADI will not meet its net ES funds transfer obligation

Paying bank	Receiving bank			Total payments
	Alpha	Beta	Delta	
Alpha		70	85	155
Beta	60		50	110
Delta	80	75		155
Total receipts	140	145	135	420
Total payments	155	110	155	
Multilateral net settlement	-15	35	-20	Payments equal receipts

\$35 settles payment orders worth \$420

### Main payment orders:

- Direct entries
  - They are pre-authorised and verified bulk payment orders and so are the cheapest form of payment order
- Direct credits- transfer into a depositor's account that have been pre-authorised and verified.
  - Payments to an account holder, such as salary payments
- Direct debits – transfer from a depositor's account
  - Payments from an account, such as loan payment deductions
- Handle the largest amount of payments because of their low processing cost and reliability

### Debit card:

- Issued by ADIs to enable them to access funds in their deposit account to settle transactions.

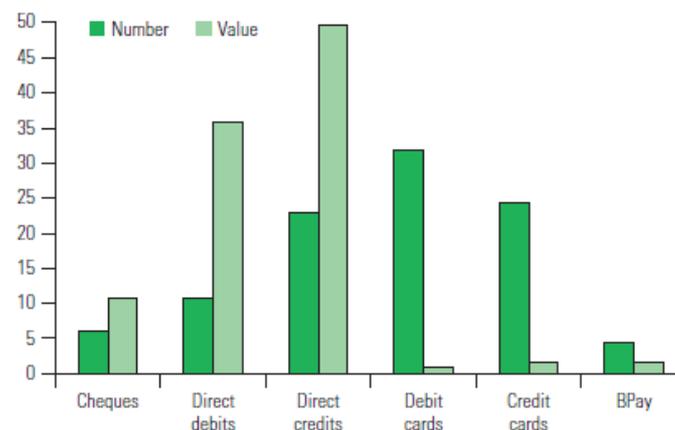
### Credit card:

- Issued by credit card companies:
  1. Credit card transaction
  2. Deposited by merchant
  3. Merchant paid by card company's bank
  4. Customer is billed
  5. Bill paid
  6. Interest is charged if unpaid

### Cheques:

- A written instruction to a drawer's ADI, authorised by the drawer's signature
- Cleared and settled (via DNS) **prior to their verification**
  - Funds are credited once deposited, but access to funds is delayed until verification
  - Depositor faces the risk that a cheque fails verification and deposit is reversed

Figure 2.4 Retail payment orders, number and value of payments, 2008–09, %



Source: RBA, Payments Systems Board (PSB), 2009, p. 7.

### Explanation for the above pattern:

- Direct transfers are 85.5% of value
  - Largely replaced cheques
  - Lower cost than cheques
  - More convenient
- Cards are widely used but low value
  - Choice between cards influenced by interchange fees
  - Since reform in 2003, debit cards have grown relative to credit cards

### **The wholesale system:**

- The processing of wholesale payments arising (mostly) from trades in the foreign exchange and debt markets
  - Trades are made when two traders agree on the price and quantity of the traded security
  - Payment is made at a specified later date (several days later) thus the amounts due are known in advance of the payment day
  - The value of individual trades is commonly \$10m
- There are 30,000 wholesale trades worth around \$165 billion each business day
- Each market's clearinghouse notifies the RBA of the paying and receiving ADI for each trade and they are fed into RTGS which arranges them in a settlement queue
- The payments in the queue are processed throughout the day
- Each ES transfer is made individually:
  - **Clears** – does the payer have sufficient ES funds? If yes
  - **Settlement** is by the immediate transfer of ES funds between the payer's ESA and the receiver's ESA

### **RTGS problems:**

- **Intra-day liquidity pressures**
- ADIs must have sufficient ES funds to meet their RTGS obligations throughout the day
  - The total amount of each ADI's payments and receipts from trading is known since the trades were made several days previous
- But during the day the sequence of each ADI's receipts and payments is not known at the start of the day and so may cause intra-day liquidity pressures
  - When an ADI's payments are scheduled before its receipts causing it to temporarily be short of ES funds

### **Solution to RTGS problem:**

- The RBA provides two 'safety values'
- 1. The RBA allows ADIs to acquire additional ES funds through **intra-day repos (repurchasing agreements)**
  - This is the RBA's purchase of a parcel of an ADI's securities (the payment adds to each ADI's ES funds) on the condition the ADI purchases them back later in the day
  - The RBA does not charge interest for the intra-day loan
- 2. Auto-offset process
  - RTGS can adjust the settlement queue if this overcomes a liquidity pressure
- The two processes enable RTGS to settle \$165 billion in payments daily with (usually) less than \$1 billion in ES funds

### **How do banks manage their ES funds?**

- ADIs have to maintain a positive balance in their ESA
- But the level of their payment system obligations can vary unexpectedly from day to day
  - So they leave funds overnight in their ESA even though they earn 25bps less than the cash rate
- If ADIs have insufficient funds in their ESA they can borrow overnight funds from the RBA
  - But they have to pay the cash rate plus 25bps for them

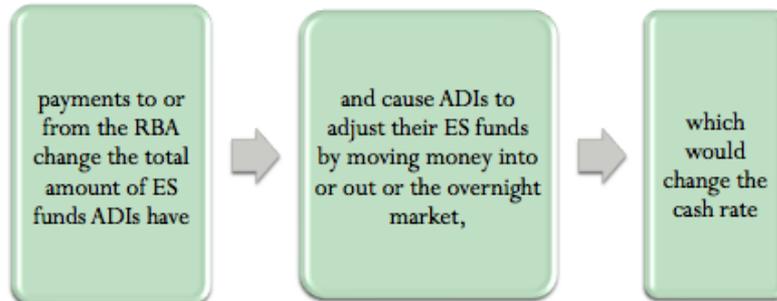
### **Inter-bank overnight market:**

- This is the market for reserves of ES funds
  - It is part of the money market where funds are lent and borrowed on a daily (meaning overnight) basis
  - The cash rate is paid on funds in the overnight market
  - And funds can be transferred between this market and ESAs
  - So ADIs hold most of their ES reserves in this market
    - See Figure 2.7 (inter-bank lending)

- ADIs also hold money-market securities that can be sold to increase their ESA balance, or purchased to lower the balance

#### Payment to and by RBA:

- Recall transfers between ADIs do not change the total amount of ES funds, but



- The RBA is the government's banker and so collects payments by the private sector to the government
  - Such as income tax and GST payments by firms and individuals
- The RBA makes payments on behalf of the government
  - Such as pensions, payments for purchases by the government of goods and services
- The RBA does not participate in the multi-bank net clearing process
- So payments to it come out of ESA balances without being re-deposited with other ADIs
  - Also payments by the RBA are not drawn on funds held in other ADIs
- Consequently its payments each day adds to the daily total of ESA funds and payments to it reduce the daily total of ESA balances
  - Total ES funds is known as the financial system's 'liquidity'

#### Consequences of RBA payments:

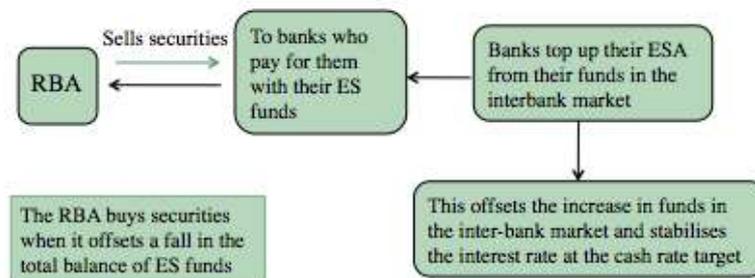
- On any day when payments by the RBA exceed payments to the RBA the financial system's liquidity increases
- This involves two steps
  - First, 'excess' ESA balances are created and
  - Second the excess is moved by ADIs into the overnight market (to earn the cash rate)
- The increase in supply of overnight funds places downward pressure on the cash rate (potentially causing it to fall below the RBA's target rate)
- Net payments to the RBA reduces ESA balances and ADIs will draw on their reserves of ES funds in the overnight market (reducing supply of these funds) placing upward pressure on the cash rate (potentially causing the rate to exceed the RBA's cash rate target)

#### Should the cash rate change daily?

- No!
- So the RBA has to take action to keep the cash rate in line with the target rate; its monetary policy setting
- The RBA uses **market operations** (MO) to prevent unintentional changes to the cash rate
- It does this by **buying or selling securities** – usually through repurchase agreements
- Figure 2.9 shows MO sterilises (i.e. offset) the impact of payments (such as tax) to the RBA

### RBA (direct) market operations:

- When RBA payments increase financial system liquidity it sells securities to avoid a drop in the cash rate:



### Summary:

- The payment system
  - ✓ system for settling retail and wholesale payments
- The retail payment system
  - ✓ deferred net settlement of retail payment orders
  - ✓ direct entries have replaced cheques as the main form of payment order
- The wholesale payment system
  - ✓ Real-time gross settlement; avoids settlement risk but supported by intra-day liquidity arrangements
  - ✓ settles foreign exchange and debt market trades
- Managing ES balances
  - ✓ ADIs hold liquid reserves in inter-bank market
  - ✓ RBA payments/receipts alter aggregate ES balances
  - ✓ DMO to control cash rate

### Australian ADIs:

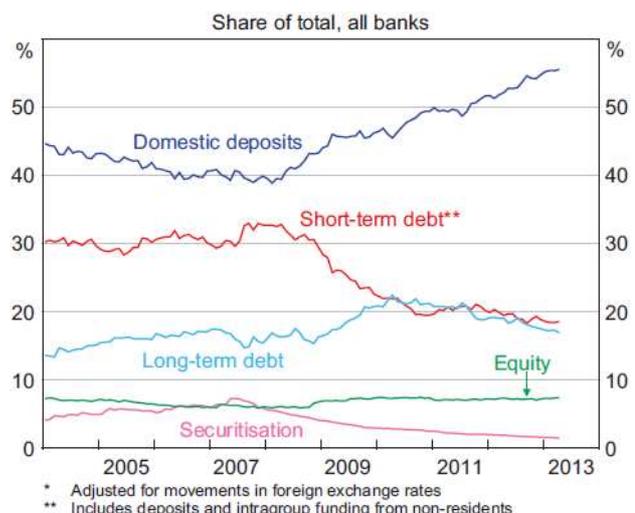
- AUS owned banks – big 4 + others
- Foreign owned subsidiary banks – retail and wholesale
- Branches of foreign banks - wholesale
- Building societies – provide retail banking services
- Credit unions – provide retail banking services

### Indirect financing:

- ADIs increase the flow of funds by managing the mismatch between the preferences of depositors and borrowers
- They transform:
  - Many small deposits into fewer larger loans
  - Short-term deposits into long-term loans
  - The risk accepted by depositors from that posed by borrowers to that posed by the ADI
- Two major sources of funds are:
  - Deposits (getting larger)
  - Financial markets (domestic and overseas) – amounts are declining

### Sources of bank funding:

- Domestic deposits (getting larger)
- Short-term debt (getting rapidly smaller)
- Long term debt (increasing slightly)
- Equity (remaining stable)



### Main uses of funds:

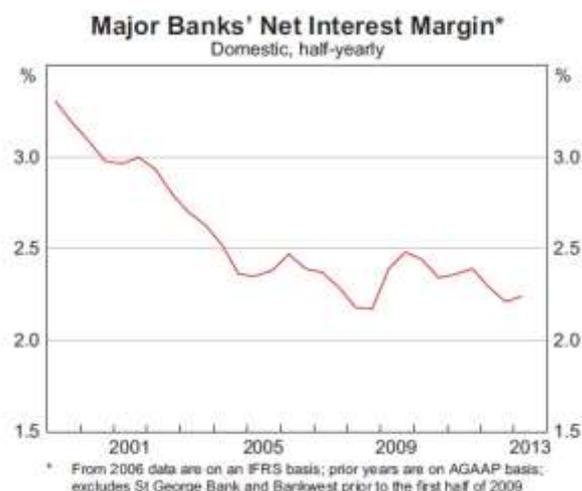
- Loans and advances (60%)
- Other assets
- Securities

### Main forms of income:

- Net interest income:
  - Interest income less interest expense
- Fee income:
  - Paid by business and households for the financial products and services they use
- Trading commissions and spreads:
  - On direct financing activities.

### Banks net interest margin:

- As shown in Figure 3.4, banks have lowered their net interest-rate margin over the past decade
- The main reasons include
  - Improved operating efficiency (their margin has to cover the banks' costs)
  - Banks have increased the average rate they pay on deposits (see Figure 3.5)
  - Banks have applied charges for services previously provided free to depositors
    - Hence the growth in bank fee income
  - Banks have lowered their rates on housing loans due to competition from mortgage originators (prior to the GFC, which forced these firms out of business)
- Bank margins rose slightly following the GFC because
  - They faced less competition in lending markets
  - They increased their holdings of liquid assets on which they earn less interest (but which reduces their liquidity and funding risks)



### Lecture 3:

### How banks raise funds: Figure 3.2:

