ECOS2004

Lecture 1: Financial markets are where funds are transferred from those who have excess of funds to those who need it. It can be a source of amplifier of instability.

<u>The bond market and interest rates</u>
- A security (financial instrument) is a claim on the issuer's future income or assets.
- A bond is a debt security that promises to make payments periodically for a specified period of time. Principal is returned to lender at maturity. Here, the interest rate is the cost of borrowing or the price of credit affecting both household consumption and saving decisions as well as business investment decisions.

<u>The stock market</u>
- Common stock (equity) represents a share of ownership in a corporation. It finances businesses.
- A share of stock is a claim on the net earnings and assets of the corporation. Stock prices rise over time as prices are rising and incomes are rising, but it is volatile. It is an important factor in business investment decisions because it affects the amount of funds that can be raised by selling newly issued stocks to finance investment spending. A higher price means the firm can raise a larger amount of funds.

Note: A linear scale chart does not provide an accurate picture of volatility etc. Log scales are better as the slope of the line represents the rate of change of the variable.

<u>Financial institutions</u>
Institutions that borrow funds from people (households and firms) who have saved and that in turn make loans to other people.
- Banks: accept deposits and make loans.
- Financial innovation: the development of new financial products and services. It can make the financial system more efficient or can lead to:
- Financial crises: sharp declines in asset prices and the failures (or government rescues) of many financial and nonfinancial firms.

Money also referred to as money supply, is anything accepted as payment for goods and services or in the repayment of debts. It generates business cycles and the rate of money growth tends to decline before recessions. Monetary policy actions changes interest rates and asset prices and thus aggregate economic activity and the price level. The causation flows in both directions.

Inflation: The aggregate price level is the average price (a weighted index of prices) of goods and services in an economy. Money supply and the price level seems to have a positive relationship. In Australia, the CPI is the measure. RBA also focuses on the underlying measures of inflation, which remove short term volatility.

Monetary policy: Traditional monetary theory postulates that CBs conduct policy by controlling the money supply or the quantity of money in the economy. Central bank policy setters no longer think in those terms. Their actions set the short-term policy interest rate. Money and credit growth are endogenous responses to these actions and to broader economic conditions. In Australia, this has been explicit in policy statements since 1990. Monetary policy is the management of and interest rates and the central bank balance sheet.

Fiscal policy deals with gov. spending and taxation. Deficit must be financed by borrowing or money creation.

Foreign exchange market: where funds are converted from one currency into another. The foreign exchange rate is the price of one currency in terms of another currency. In a floating rate system, the market determines the foreign exchange rate. Dollar appreciation means imports increase and exports decrease and vice versa.

The international financial system has important effects on domestic economies:
- Effect of the exchange rate on domestic economy
- International transmission of financial stress
- Role of international financial institutions like the IMF

NB: Aggregate output = GDP = market value of all final goods and services produced in a country during the course of a year = Aggregate income: the total income of factors of production (land, labour, and capital) from producing goods and services in the economy during the course of the year.
- GDP deflator = nominal GDP/real GDP. This measures the aggregate price level.
- PCE deflator = nominal personal consumption expenditure / real PCE.

Financial System Overview

Financial markets perform the essential function of channelling funds from economic agents who have saved surplus funds to those that have a shortage of funds. These are critical for producing efficient allocation of capital which lends to higher production and efficiency. Consumers can schedule purchases better.

Direct finance: borrowers borrow directly from lenders by selling securities such as bonds or stocks.
Intermediated finance: an intermediary such as a bank facilitates between borrower and lender.

Structure of financial markets
- Debt instrument such as bonds or mortgages are short-term if its maturity term is less than a year and long-term if its maturity term is ten years or longer. In between, it is intermediate-term.
- Equities (dividends) are like common stock, often making periodic payments (dividends). Equity holder is a residual claimant; that is, the corporation must pay all its debt holders before it pays its equity holders. The advantage of holding equities is that equity holders benefit directly from any increases in the corporation's profitability or asset value because equities confer ownership rights on the equity holders.

In stock terms, the majority of corporate funding is equity rather than debt. Household borrowing comes mainly from banks. Australian entities can also issue securities offshore.

Primary and Secondary Markets: A primary market is a financial market in which new issues of a security, such as a bond or a stock, are sold to initial buyers often behind closed doors. A secondary market is a financial market in which securities that have been previously issued can be resold. Investment banks underwrite (facilitate the sale of) securities in primary markets. Brokers and dealers work in secondary markets. A corporation only raises capital in the primary markets. The secondary market makes securities more liquid, thereby helping the firm to issue new securities. The secondary market also determines the price of a security in the primary market.

Exchanges and Over the Counter Markets:
- Exchanges: Market with formal location. Includes stock exchange
- OTC markets: Dealers decentralized and linked electronically. Includes foreign exchange and most other markets other than equities and futures.

Money and capital markets: "Money markets" (more correctly, [short-term] securities markets) deal in short-term debt instruments (more liquid, smaller fluctuations in prices). "Capital markets" deal in longer-term debt and equity instruments with maturities of greater than one year e.g. stocks, mortgages, bonds, government securities.

Function of Financial Intermediaries
Indirect Finance: Lower transaction costs (time and money) with economies of scale and liquidity services. They also reduce exposure of investors to risk by risk sharing (asset transformation) and diversification.
They deal with asymmetric information problem of adverse selection (before the transaction): try to avoid selecting the risky borrower by gathering information about them. There is also moral hazard (after the transaction): ensure borrower will not engage in activities that will prevent him/her to repay the loan. Sign a contract!

Regulation of the Financial System: to increase the information available to investors, reduce adverse selection and moral hazard problems, reduce insider trading and related violations (mainly ASIC in Australia). There are:
- Restrictions on entry (chartering process).
- Disclosure of information.
- Restrictions on Assets and Activities (control holding of risky assets).
- Deposit insurance (avoid bank runs).
- Limits on Competition (mostly in the past)

In Australia, we have The Council of Financial Regulators (CFR). Comprises the Reserve Bank of Australia (RBA) (which chairs the Council), the Australian Prudential Regulation Authority (APRA); the Australian Securities and Investments Commission (ASIC); and the Australian Treasury. Meetings are chaired by the RBA Governor.

Lecture 2: Money and Interest rates

Money (a stock concept) is different from
- Wealth: total collection of assets (this is a stock but broader than money)
- Income: flow of earnings per unit of time (a flow concept)

Functions:
- Medium of exchange: Eliminates the trouble of finding a double coincidence of wants (reduces transaction costs). Promotes specialization in production/labor services. This must be: *easily standardized, widely accepted, divisible, easy to carry and not physically deteriorate quickly.*
- Unit of account: used to measure value in the economy, reduces transaction costs.
- Store of value: used to save purchasing power over time. Other assets (e.g. securities) also serve this function but money is the most liquid of all assets: it has fixed *nominal* value, but money loses *real* value (purchasing power) during periods of inflation.

Payments system:
- *Commodity money*: valuable, easily standardized and divisible commodities
- *Fiat money*: paper money (including coins) decreed by governments as legal tender.
- *Cheque*: an instruction to your bank to transfer money from your deposit account.
- *Electronic Payment* (e.g. online bill pay and electronic deposit transfers).
- *E-Money* (electronic money):
    o Debit card
    o Stored-value card (smart card)
    o E-cash

M1 (the most liquid assets) = currency + traveler's checks + demand deposits + other checkable deposits
M2 (adds to M1 other assets that are not so liquid) = M1 + small-denomination time deposits + savings deposits and money market deposit accounts + money market mutual fund (MMMF) shares (not counted in M).
M is the non-bank private sector's holdings for money. Bank's holding of deposits in other banks and treasury deposits should be excluded in the M measure.

In Australia:
Currency: notes and coin held by the non-bank public
M1: currency, plus "current deposits" (transferable deposits) with commercial banks
M3: currency, plus all bank deposits
Broad Money: M3 plus deposits with nonbank depository institutions (close to American M2).

Interest rates (the yield to maturity)
Present value: dollar paid to you in a year is less valuable than a dollar paid to you today. Reason: dollar deposited today can earn interest and you are constraining yourself opportunity to spend next year.

Credit market instruments:
- Simple loan with interest rate and maturity (commercial loans)
- Fixed-payment loan with principal and interest (mortgages)
- Coupon bond with fixed interest payment, maturity date and face value (US treasury bonds)
- Discount bond (zero-coupon bond) bought at price below face value and face value repaid at maturity

Simple interest rate: interest payment / amount of loan.
$\quad$ If \$100 deposited for n years; \$100 x $(1+i)^n$
$\quad$ Therefore, $PV = \frac{CF}{(1+i)^n}$ discounting the future cash flow

Yield to maturity: the i that equates PV of the total cash flow payments received from a debt instrument with its value today. For simple loans, the simple interest rate is the yield to maturity.

- Fixed payment loan: the same cash flow payment every period throughout the life of the loan.

$$LV = \frac{FP}{1+i} + \frac{FP}{(1+i)^2} + \frac{FP}{(1+i)^3} + \ldots + \frac{FP}{(1+i)^n}$$

LV = loan value, FP = fixed yearly payment

- **Coupon bond**: when the coupon bond is priced at its face value, the yield to maturity equals the coupon rate. The price of a coupon bond and the yield to maturity are negatively related. The yield to maturity is greater than the coupon rate when the bond price is below its face value.

$$P = \frac{C}{1+i} + \frac{C}{(1+i)^2} + \frac{C}{(1+i)^3} + \ldots + \frac{C}{(1+i)^n} + \frac{F}{(1+i)^n}$$

P = price of coupon bond, C = yearly coupon payment, F = Face value

- **Consol or perpetuity**: a bond with no maturity date; does not repay principal but pays fixed coupon payments forever.

$P_c = C/i_c$ or $i_c = C/P_c$ (as i increases, P_c falls)

- **Discount bond**: the yield to maturity equals the increase in price over the year divided by its initial price. Yield to maturity is negatively related to the current bond price. For any one year discount bond

$$i = \frac{F-P}{P}$$

F = face value of the discount bond, P = current price of the discount bond

Distinction between interest rates and rate of returns

The rate of return is the amount of each payment to the owner plus the change in the security value, expressed as a function of its purchase price. The return will not necessarily equal interest rates.

The return equals the yield to maturity only if the holding period equals the time to maturity. A rise in interest rates is associated with a fall in bond prices, resulting in a capital loss if time to maturity is longer than the holding period. Even if a bond has a substantial initial interest rate, its return can be negative if interest rates rise.
The more distant a bond's maturity, the greater the size of the percentage price change associated with an interest-rate change. The more distant a bond's maturity, the more negative is the rate of return that arises from an increase in the market interest rate. This is because the more years until a bond matures, the more years its initial interest rate (i.e., coupon payment/original bond price) is low in relation to the market rate, and so the lower is the price that new buyers will be willing to pay for that bond.

Hence: the yield (and hence price) of a bond today depends on the expected yield and price tomorrow

Maturity and the volatility of bond returns: interest-rate risk: Prices and returns for long-term bonds are therefore more volatile than those for shorter-term bonds. Long term debt instruments have substantial interest rate risk. There is no interest-rate risk for any bond whose time to maturity matches the holding period. (But there is still an opportunity for cost/gain if the market yield changes during that period.

Real interest rate: adjusted for changes in the price level so more accurately reflects the cost of borrowing. *Ex ante real interest rate* is adjusted for expected changes in the price level. (this is the driver of decision makers). *Ex post real interest rate* is adjusted for actual changes in the price level.

Fisher equation: $i = i_r + \pi^e$

While generally true, there are spikes in the short term, so it does not follow this exactly and expectations lag can occur, so correlation may be distorted.