



FOUNDATIONS OF FINANCE

BFC1001

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Notes

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What is Finance?

Finance: The **raising of money** (capital).

- **Capital:** Money that is used for investment
- **Equity:** Owners' money
- **Debt:** Borrowed money

- How to finance:
 1. Existing funds of owners (**Equity**)
 2. Sharing ownership – selling part of the business to the public (**Equity**)
 3. Borrow money (**Debt**)

Investment: The **making** of money, using capital.

- Capital raised is used to buy assets that make money (generate a return)
- Assets bought depend of the type of business being run

Capital Budgeting: The process of **using capital to buy assets**.

Investment and Financing Decisions

- **Investment Decisions** – Assets
- **Financing Decisions** – Liabilities/Debt, Equity

Cost of Capital: How much (%) needs to be paid for debt and equity.

Weight Average Cost of Capital (WACC): Measure of the cost of capital, using a **weighted average** of debt and equity costs.

Capital Structure: Partition of capital between debt and equity.

→ Assets bought must earn a return that is greater than RROR (required rate of return)

$$\rightarrow E(R)_{\text{Assets}} > RROR_{\text{Capital}}$$

Flow of Funds

Flow of Funds: Where capital is transferred from **surplus** units to **deficit** units in an economy.

- Important as it enables money to be transferred from those who have excess capital to those who need it
 - e.g. People who need to take out a loan to start a business

- A well functioning and developed financial system allows for the efficient flows of funds

Three ways for the flow of funds to occur in an economy:

1. Direct transfer between surplus and deficit units
2. Indirect transfer using an investment bank
3. Indirect transfer using a financial intermediary (apart from an investment bank)

Components of the Financial System of an economy:

1. **Financial Institutions:** Business that **facilitate** the flow and transfer of funds by **providing intermediation**.
2. **Financial Instruments:** Primarily types of debt and equity that are **vehicles** for the flow/transfer of funds.
3. **Financial Markets:** Where financial instruments are **created and traded**.

Efficient flow of funds means:

- Capital is **not mispriced**
 - Price paid for capital is appropriate, not severely over/under capital's fair value
- Surplus and deficit units have **liquidity**
 - Ease with which money is able to be taken out / spent
 - Deficit units are able to raise the capital they need and surplus units have enough capital to meet deficit units they need
- There is **sufficient depth** of financial markets
 - Sufficient participants and money such that the market still holds in the case of the failure of individual participants

Financial Intermediation vs Direct Financing

Intermediation: The use of a **third party** to bring together surplus and deficit units – allows the preferences of both parties to be met.

Key benefits:

- **Asset** transformation – Turning deposits into loans
- Credit **risk** transformation and diversification – Low risk deposits turned into higher risk loans and different types of loans
- **Liquidity** transformation – Short-term debt (deposits) used to fund long-term assets (loans)
- Economies of **scale** – The larger banks are, the cheaper intermediation becomes

Direct Financing: Where deficit and surplus units **seek each other out** and enact the flow of funds between them without the use of an intermediary.

Key benefits:

- **Saves on the cost of intermediation**
- Allows **access to non-standard/unique products** not offered by intermediaries
- Deficit units can issue finance that is **unique to their specific funding requirements** instead of relying on a "cookie-cutter" product – allows for **greater flexibility** in funding

Disadvantages:

- Difficulty in **matching** preferences between surplus and deficit units
- Higher **risk** of liquidity and marketability of direct finance instruments
- Higher search and transaction **costs**
- Difficulty in **assessing** risk

Financial Markets

Primary market: Where financial securities are **created**.

Secondary market: Where financial securities are traded **after creation**.

Public market: A central marketplace **open to the public** where buyers and sellers meet to trade.

Private market: Where buyers and sellers transact **without open advertisement and inclusion** of the public.

Money market: **Short term** financial instruments (<12 months).

Capital market: **Long term** financial instruments (>12 months).

Wholesale market: A **direct** and **private** market where **large fund flow transactions** occur between government/institutional/corporate surplus and deficit units.

Retail market: Primarily an **intermediary market** where surplus and deficit units are individuals, households and small businesses involve **small transactions**.

Rates of Return

Rate of return: The percentage earned on the capital invested.

- Needs to be **quantified** over a time period

- Risk-free and risky
 - All risky assets should earn **$E(R) > \text{risk-free } E(R)$**

Opportunity cost of funds: The rate of return on the next-best investment alternative to the investor.

Nominal interest rate: The quoted interest rate and interest rate paid on debt securities without an adjustment for any loss in purchasing power.

Real risk-free interest rate: The interest rate on a fixed-income security that has no risk in an economic environment of zero inflation.

Premium: A rate of return above a benchmark.

Inflation premium: Rate of return added to compensate for inflation.

- Higher inflation = higher inflation premium

Risk premium: The rate of return for bearing risk – total premium for all risks taken.

- **$\text{Risk Premium} = E(R)_{\text{Asset}} - R_f$**

Default-risk premium: Rate of return added to compensate for default-risk (risk of borrower defaulting – not making debt repayments).

- Higher default-risk = Higher default-risk premium

Maturity-risk premium: Rate of return added to compensate for assets that have longer terms to maturity.

- The longer it takes to receive money back, the more risky the investment is

Liquidity-risk premium: Rate of return added to compensate for assets that cannot be quickly converted into cash at a reasonably predictable price.

Expected Rate of Return: What is **forecasted** to be earned (%) on assets.

Required Rate of Return (Hurdle Rate): **Minimum** percentage needed to be earned on capital invested.

Value, Time and Money (Annuity Financial Math)

Annuities

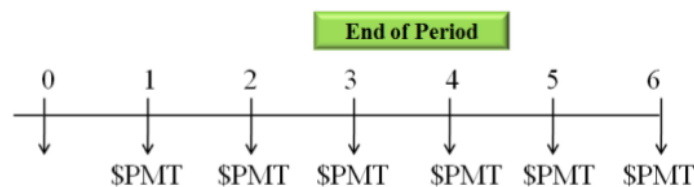
Annuity: Any financial contract that calls for **equally spaced and level cash flows** over a **finite number of periods**.

- When valuing annuities, rather than discounting/compounding each cash flow individually, a single formula can be applied for ease of understanding and calculation (as each cash flow is the same and equally spaced over time)

Ordinary Annuities

Ordinary Annuity: An annuity structured so that cash payments are paid or received at the **end of each period**.

- Most annuities are ordinary annuities
- Also called – Annuity in Arrears or a Deferred Annuity
- Assume ordinary annuity unless otherwise stated – 1st cash flow occurs **1 period after the start** of the annuity
- A **fixed amount** of money is paid/received at **fixed intervals** of time for a **fixed period** of time



Valuation of Ordinary Annuities

$$PV = \frac{PMT}{i} \left[1 - \frac{1}{(1+i)^n} \right] \quad FV = \frac{PMT}{i} [(1+i)^n - 1]$$

FV = Future value of the annuity

PV = Present value of the annuity

PMT = Cash flow received/paid under the annuity

n = Number of payments/periods

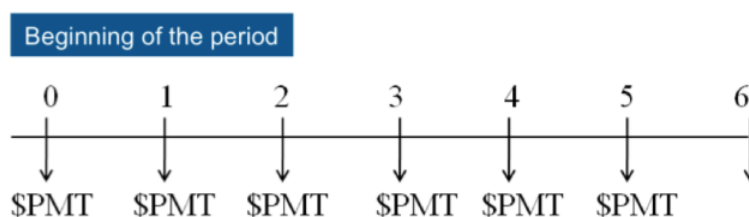
i = Per-period discount rate (PV) or compound rate (FV)

→ PV of Ordinary Annuities is for **time period before the 1st payment**

Annuity Dues

Annuity Due: An annuity structured so that cash payments are paid or received at the **start of each period**.

- Also called an Annuity in Advance
- 1st cash flow occurs at the start of the annuity



Valuation of Annuity Dues

$$PV = \frac{PMT}{i} \left[1 - \frac{1}{(1+i)^n} \right] \times (1+i) \quad FV = \frac{PMT}{i} [(1+i)^n - 1] \times (1+i)$$

FV = Future value of the annuity

PV = Present value of the annuity

PMT = Cash flow received/paid under the annuity

n = Number of payments/periods

i = Per-period interest rate

→ PV of Annuity Dues is for **time period of the 1st payment**

Annuity Applications

Deferred Annuities

Deferred Annuity: An annuity that does not start in Y_0 but in the **future**.

Equivalent Annual Annuities

Equivalent Annuity: Used to evaluate annuities with **uneven lives**.

Calculating Equivalent Annual Amounts (EAAs):

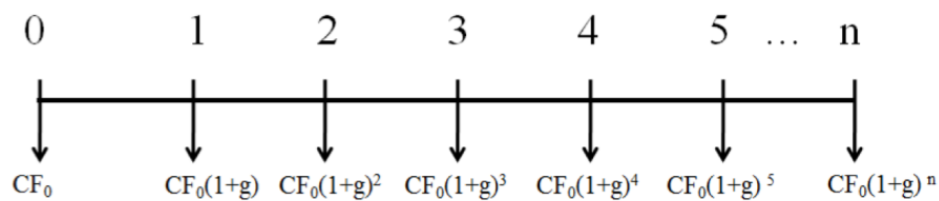
Ordinary Growth Annuity: $EAA = \frac{PV_{Annuity} \times i}{\left[1 - \frac{1}{(1+i)^n} \right]}$

Growth Annuity Due: $EAA = \frac{PV_{Annuity} \times i}{\left[1 - \frac{1}{(1+i)^n} \right] (1+i)}$

$PV_{Annuity}$ = Present value of annuity
 i = Interest rate per period
 n = Number of payments/periods

Growth Annuities

Growth Annuity: An annuity structured so that the **cash flow increases** each period at a **constant growth rate**.



Growth Annuity Formulae:

Ordinary Growth Annuity: $PV = \frac{CF_0(1+g)}{(i-g)} \left[1 - \left(\frac{1+g}{1+i} \right)^n \right]$

Growth Annuity Due: $PV = CF_0 + CF_0(1+g) \left[\frac{1 - \left(\frac{1+g}{1+i} \right)^{n-1}}{i-g} \right]$

CF_0 = Cash flow in Period 0
 i = Interest rate per period
 g = Constant growth rate per period
 n = Number of payments/periods

Perpetuities

Perpetuity: An annuity where the cash flow continues for an **indefinite period**.

○ $n = \infty$

Perpetuity Formulae:

Ordinary Perpetuity: $PV = \frac{PMT}{i}$

Perpetuity Due: $PV = PMT + \frac{PMT}{i}$

PMT = Cash flow per period
 i = Interest rate per period

- As with annuities, the ordinary perpetuities formula establishes PV one period before the first cash flow, while the perpetuity due formula establishes PV at the same period as the first cash flow
- As with annuities, perpetuities can also be deferred

Growth Perpetuities

Growth Perpetuity: A perpetuity is where the **cash flow increases each period** at a **constant rate for infinity**.

Growth Perpetuity Formulae:

Ordinary Growth Perpetuity: $PV = \frac{CF_0(1+g)}{(i-g)}$

Growth Perpetuity Due: $PV = \frac{CF_0(1+g)}{(i-g)} \times (1+i)$

CF_0 = Cash flow in Period 0 – note $CF_0(1+g) = CF_1$

i = Interest rate per period

g = Constant growth rate per period

Annuity Learning Map

