Specialisation: Assumptions

1. Competitive markets

2. Capital (money) and flow (relatively) easily

3. Frictions (e.g. government taxes) are small relative to the power of most good ideas

4. But with increasing incorporation of real world issues (especially in Courses 3 and 4)

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MODULE 1: TIME VALUE OF MONEY

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1.1 TIME VALUE OF MONEY (TVM) (12.12)

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Some Terminology (language of finance)

PV = Present Value ($)

FV = Future Value ($)

n = # of Periods (#)

r = Interest rate (%) > 0 (assumption)

1.2 SIMPLE FUTURE VALUE (FV) (14.47)

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FV = PV \* (1 + r)

for one period (n = 1)

1.3 SIMPLE FV (10:06)

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FV = PV \* (1 + r) ^n

1.4 SIMPLE FV: EXAMPLE (19:54)

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NO NOTES

1.5 SIMPLE PRESENT VALUE (PV) (15:58)

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PV = FV / (1 + r)^n

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MODULE 2: TIME VALUE OF MONEY - APPLICATIONS

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2.1 FV OF ANNUITY: CONCEPT

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A special case of multiple payments: annuities:

C (cash flow) or PMT (payment)

2.2 FV OF ANNUITY: EXAMPLE 1

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MODULE 3: DECISION MAKING

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3.1 DECISION CRITERIA: NPV

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**Properties of a good decision criterion:**

1) makes sense? (benefits exceed costs) [TVM]

2) unit of measurement [$]

3) benchmark [NPV > 0]

4) easy to communicate

5) easy to compare different ideas/projects

6) easy to calculate

7) others?

**Net Present Value (NPV)**

To compute NPV, compute PV of all future cash flows and then sum them.

3.5 DECISION CRITERIA: IRR

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Internal rate of return (IRR) is measured in %/period \*e.g. %/year.

IRR = (FV – PV)/PV == Profit / Investment

IRR has no value on its own; it is a valuable measure when compared against the market interest rate r.

If IRR > r, then internal business will return a profit. If IRR == r, no profit; otherwise, do not invest in business because market performs better (invest in the market instead)

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MODULE 4: DECISION MAKING & CASH FLOWS

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4.2 CASH FLOWS: A TEMPLATE

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Cash flows from project/operations

+ Revenues = price x quantity (P x Q)

price = market price

- Costs of goods sold (P x Q) of inputs (can be thought of as opposite of renvenues)

- Selling, general and admin costs

- Depreciation

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= Operating profits

- Cash Taxes on operating profits

= Net operating profits after tax

+Depreciation

- Capital Expenditures (capex) (fixed cost) (comes from balance sheet B/S)

- Increases in working capital (B/S)

= Cash flows from operations

capex comes from balance sheet whereas everything else comes from income statements

4.4 CASH FLOWS: IMPORTANT PRINCIPLES

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1) Calculate incrementally (delta cash flow = A1 – B1, …, An – Bn)

2) Do not forget importance of year 0 and the last year of the chosen timeline for the project.

**Year 0 capital = expenditure (capex) + working capital**

would like to deduct all capex in year 1 as depreciation to minimise tax (due to TVM). But can't do that, so account for this as decpreciation over project using straight line / project duration.

Example: capex = 10M

project over 10 years

depreciation = 1M/year

Working capital = cash + inventory + account receivables (acc rec (AR)) – acc payables

AR – things sold on credit and person hasn't paid

The higher the working capital, the less efficient the operation (business). Good companies like walmart minimise working capital.

Dell – “my business is working capital (inventory) management.”

Working capital is a stock, so measure its changes.

4.5 CASH FLOWS: IMPORTANT PRINCIPLES II

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1) Depreciation (made up) similar non-cash items

2) Capital = capex + working capital (from balance sheet B/S so have to think about changes (Delta))

3) Do not mix financing with operations

Operations is concerned with assets (chas flows and market rate).

Financing is concerned with liabilities (equity + debt).

4) Include the effects of inflation/deflation

5) Do not compare projects with unequal lives

e.g. bonds have finite life, stocks have infinite life.

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Cash flows from project/operations

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+ Revenues - Costs of goods sold - Selling, general and admin costs - Depreciation

= Operating profits

- Cash Taxes on operating profits

= Net operating profits after tax

+ Depreciation - Capital Expenditures (capex) - Increases in working capital (B/S)

= Cash flows from operations