CORPORATE FINANCE

LECTURE 1 – ESTIMATING THE CASH FLOWS AND NPV OF A PROJECT

Cash flows	Estimating the cash flows on an incremental basis **The value of a project depends on all the incremental (additional) cash flows after-tax that follow from project acceptance** • Cash flows are different to accounting profits which include income and expenses not yet received/paid as well as depreciation charges which are not cash flows at all • Important to include all incidental effects on the remainder of the firm's business such as existing products sales • Recognize after-sales cash flows to come later such as downstream activities on service and spare parts WORKING CAPITAL REQUIREMENTS – Showing profit as its earned 1. **Cash inflows** = *SALES – INCREASE IN ACCOUNTS RECEIVABLE* a. Accounts receivable = asset, money that is going to come in 2. **Cash outflows** = *COGS + Increase in inventory (INV) – Increase in accounts payable (AP)* *a.* Inventory = products ready for sale, working progress, working materials **Net cash flow** = *cash inflow – cash outflow =* ***[Sales – COGS] – [AR + INV – AP]*** **Net working capital = inventory + accounts receivable – accounts payable.** • Positive **[AR + INV – AP]** is an additional investment in networking capital (working capital) AND IS A CASH OUTFLOW ○ Negative is a inflow • All investments in working capital over the life of the project are recovered as cash inflow at the end of the project's life
Opportunity costs	Always include opportunity costs the loss of other alternatives when one alternative is chosen. These may be: • A resource used in a project even when no cash changes hands • E.g. a new operation will use an already acquired land that could otherwise be sold or used for another purpose – should use the greatest value of the possible alternative productive uses for the land. • the basis of "with or without"
Sunk costs, allocated overhead costs, inflation and salvage value	1. Sunk costs = cost that's already occurred a. Do not include, ignore past and irreversible sunks 2. Overheads = Accounts allocation of overhead costs a. Do not include, only include any changes in overhead that happens in the project 3. Salvage value = net of any taxes, can you sell any equipment, building, land at the end of the projects life? 4. Inflation = consistently account for inflation – discount cash flows at a nominal rate of return and real cash flows at a real rate

Separate investment and financing decisions	1. Analyse the project as if it were all **equity-financed** 2. If a project is partly financed by debt, we will neither subtract the debt proceeds from the required investment nor recognise interest and principal payments on the debt as cash outflows 3. Financing costs are recognised in the discount rate instead
Depreciation	• An allowable deduction against profit • Provides an annual *tax shield = (depn * tax rate)* • The tax shield is *implicitly* shown in the reduced amount of tax on operations recorded in the income statement • As depreciation is a noncash expense, it has to be added back to profit after-tax to arrive at the net cash flow • Straight-line depreciation only is used in CF:T&P
EXAMPLE	1. Capital cost of a new 4-year machine = $25,000 2. Salvage value of new machine in year 4 = $1,000 3. Current salvage of old machine = $2,000 4. Current book value of old machine = $5,000 a. Reducing tax to pay, so an inflow 5. Extra **initial** inventory = $1,500 a. Will go in at the beginning and come out at the end 6. Increase in working capital in year 1 to 3 are $500, $700 and $300 respectively 7. Existing warehouse space to install the new machine can be sold today for $10,000 after-tax and has no value in year 4 8. Increase in before-tax revenue = $8,500 p.a. 9. Increase in before-tax operating costs = $2,500 p.a. 10. Allocated overhead costs = $1,300 p.a. 11. Annual depreciation of old machine = $1,250 (4 years) 12. Annual depreciation rate of new machine on straight-line basis = 25% a. i.e. $25,000 * 0.25 = $6,250 13. Tax rate = 30% 14. Required rate of return = 10%

EXAMPLE TABLE

		Year 0	Year 1	Year 2	Year 3	Year 4
1	New machine	-25000				1000
2	Old machine	2000				
3	Tax effect on sale	900				-300
4	Working capital	-1500	-500	-700	-300	3000
5	Opportunity cost warehouse	-10000				
6	**Capital cash flow**	-33600	-500	-700	-300	3700

- Tax effect on sale of old machine in Year 0
  = tax rate * (book value – sale price) = 0.3 * (5,000 – 2,000)
  = 900
- Opportunity cost of existing warehouse = market value of $10,000 foregone
- Tax effect on sale of new machine in year 4
  = tax rate * (book value – sale price) = 0.3 * (0 – 1,000) = -300
- Recovery of working capital in year 4 = 1,500 + 500 + 700 + 300
  = +3,000
- Working capital is not taxable

		Year 0	Year 1	Year 2	Year 3	Year 4
7	Increased revenue		8500	8500	8500	8500
8	Increased costs		-2500	-2500	-2500	-2500
9	Increased depreciation		-5000	-5000	-5000	-5000
10	Profit before tax		1000	1000	1000	1000
11	Tax at 30%		300	300	300	300
12	Profit after tax		700	700	700	700
13	Increased depreciation		5000	5000	5000	5000
14	**Operating cash flow (12+13)**		5700	5700	5700	5700
15	**Total cash flow (6+14)**	-33600	5200	5000	5400	9400
16	Present value @10%	-33600	4727	4132	4057	6420
17	NPV =	-14263				

- Increased depreciation = new depreciation – old depreciation
  = 6,250 – 1,250
  = 5,000

Problem 1: investment timing decision

Work out when the project is at it's most valuable

- The most positive/highest NPV you can get
- NPV is the amount you are increasing the value of your firm by
- **10% -** *the net future value increase by 10 as it includes riskyness of the project and time value of it*

Year 4 is optimal for maximum NPV

$100 \times 1.1^{-4} = 68.3$

- You maximise the NPV of your investment if you

Start date, year	0	1	2	3	4	5
Net future value at start date *t*	50	64.4	77.5	89.4	100	109.4
Change in value from previous year (%)		28.8	20.3	15.4	11.9	9.4
NPV @ 10%	50	58.5	64.0	67.2	68.3	67.9

	commence the project as soon as the rate of increase in value drops below the cost of capital