

Week Four Session One Tutorial Case Question Answers

Year	1	2	3	4	5
	\$000	\$000	\$000	\$000	\$000
Contributions	440	550	660	660	
Fixed costs	(240)	(260)	(280)	(300)	
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Taxable cash flow	200	290	380	360	
Taxation		(60)	(87)	(114)	(108)
CA tax benefits		60	45	34	126
Scrap value				30	
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After-tax cash flows	200	290	338	310	18
Discount values	0.909	0.826	0.751	0.683	0.621
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	182	240	254	212	11

	\$000
Present value benefits	899
Initial investments	800
Net present value	99

The net present value is positive and so the investment is financially acceptable. However, demand becomes greater than production capacity in the fourth year of operation and so further investment in new machinery may be needed after three years. The new machine will itself need replacing after four years if production capacity is to be maintained at an increased level. It may be necessary to include these expansion and replacement considerations for a more complete appraisal of the proposed investment.

A more complete appraisal of the investment could address issues such as the assumption of constant selling price and variable cost per kilogram and the absence of any consideration of

inflation, the linear increase in fixed costs of production over time and the linear increase in demand over time. If these issues are not addressed, the appraisal of investing in the new machine is likely to possess a significant degree of uncertainty.

Workings

Annual contribution

Year	1	2	3	4
	\$000	\$000	\$000	\$000
Excess demand (kg/yr)	400,000	500,000	600,000	700,000
New machine output (kg/yr)	400,000	500,000	600,000	600,000
Contribution (\$/kg)	1.1	1.1	1.1	1.1
Contribution (\$/yr)	<u>440,000</u>	<u>550,000</u>	<u>660,000</u>	<u>660,000</u>
Capital allowance (CA) tax benefits				

Year	Capital allowance (\$)	Tax benefit (\$)
1	200,000 ($800,000 \times 0.25$)	60,000 ($0.3 \times 200,000$)
2	150,000 ($600,000 \times 0.25$)	45,000 ($0.3 \times 150,000$)
3	112,500 ($450,000 \times 0.25$)	33,750 ($0.3 \times 112,500$)
4	$450,000 - 30,000 = 420,000$	126,000 ($0.3 \times 420,000$)

Working out the cost of capital if using after tax weighted average cost of capital.

$$11 \times 0.8 + (8.6 \times (1 - 0.3) \times 0.2) = 10\%$$

↑ Cost of equity 11%
 ↑ Finance of equity 80%
 ↑ before cost of debt 8.6%
 ↑ tax at 30%
 ↑ Finance of debt 20%

Capital allowances tax benefits

Year	Capital Allowances \$	Tax benefits \$
1	$800,000 \times 0.25 = 200,000$ machine cost reduced by 25% claims on machine	$200,000 \times 0.3 = 60,000$ tax rate
2	$600,000 \times 0.25 = 150,000$ reduced by 25% each year	$150,000 \times 0.3 = 45,000$
3	$450,000 \times 0.25 = 112,500$	$112,500 \times 0.3 = 33,750$
4	$450,000 - 30,000 = 420,000$	$420,000 \times 0.3 = 126,000$

Contribution working

Contribution is revenue minus variable expenses so we can work out a ratio to work it out fast if we want as we do in this question. So because selling price of fibre is \$8 per kg, but it costs \$5 (variable cost) per kg and also has \$1.90 (variable cost) per kg. So $\$8 - 5 - 1.90 = \$1.1$ per kg ratio contribution.

Contribution of excess demand of buying new machine

	Year 1	Year 2	Year 3	Year 4
Excess demand (kg/yr)	400,000	500,000	600,000	700,000
New machine output (kg/yr)	400,000	500,000	600,000	600,000
Contribution (\$/kg)	1.1	1.1	1.1	1.1
Contribution (\$/yr)	440,000	550,000	660,000	660,000

<u>Year</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>Σ</u> \$'000
Contribution	440	550	660	660	
Fixed costs	(240)	(260)	(280)	(300)	
Taxable cash flow (tax cash flow worked out by contribution minus fixed costs)	200	290	380	360	

Starts at 240 and increases by 20 each year after operation

Taxation (Tax is paid one year in arrears at 30% annually so you have taxable cash flow by 30% (0.3))	(60)	(87)	(114)	(108)	
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Capital Allowances tax benefits (In arrears that is why not in year one)	60	45	34	126	
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Scrap value				30	
After-tax cash flow	200	290	338	310	18

Discount at 10%	0.909	0.826	0.751	0.683	0.621
Present value of cash flows	182	240	254	212	11

Present value benefits of cash flow

899

Initial investment
Net present value

800
99

Net present value + so the investment is acceptable