THE UNIVERSITY OF MELBOURNE

FNCE10002 Principles of Finance
Semester 1, 2019

Capital Budgeting II
Suggested Answers to Tutorial Questions for Week 9

Note that detailed answers to tutorial questions from Part II will only be provided in tutorials. The following abridged answers are intended as a guide to those detailed answers. This policy is in place to ensure that you attend your tutorial regularly and receive timely feedback from your tutor. If you are unsure of your answers you should check with your tutor, a pit stop tutor, online tutor or me.

While detailed answers to Part I appear below, if you are not sure of the answers to these questions please ask your tutor in the following week's tutorial.

Part I – Answers Submitted to Your Tutor

A. Problems

A1. The completed table is as follows.

Year	Cash inflows	Cash outflows	Net cash flows	Present value of cash flows
0	\$20,000 + \$12,500[a]	\$7,000 + \$35,000[b]	–\$9,500	–\$9,500
2	\$22,050	\$7,865	\$14,185	\$10,726
4	\$24,310	\$8,837	\$15,473	\$8,847
			NPV	**\$10,073**

[a] Present value of increased net cash flows from improvements.
[b] The initial outlay.

Cash flows in year 0

Tickets sold = $0.75 \times 400 = 300$.

Tickets sold at \$60 = $^2/_3 \times 300 \times 60 = \$12{,}000$.

Tickets sold at \$80 = $^1/_3 \times 300 \times 80 = \$8{,}000$.

Cash inflow from ticket sales = 12000 + 8000 = \$20,000.

Present value of increased net cash flows from improvements (given) = \$12,500.

Initial outlay = \$35,000.

Operating cost in year 0 = \$7,000.

Net cash flow in year 0 = 20000 + 12500 – 7000 – 35000 = –\$9,500.

Cash flows in year 2

Both ticket prices are increasing at the same rate of 5% p.a. while the operating cost is increasing at a rate of 6% p.a.

Cash inflow from ticket sales in year 2 = $20000 \times (1.05)^2$ = \$22,050.

Cash outflow from operating cost in year 2 = $7000 \times (1.06)^2$ = \$7,865.

Present value of year 2 net cash flow = $(22050 – 7865)/1.15^2$ = \$10,726.

Cash flows in year 4

Again, both ticket prices are increasing at the same rate of 5% p.a. while the operating cost is increasing at a rate of 6% p.a.

Cash inflow ticket sales in year 4 = $20000 \times (1.05)^4$ = \$24,310.

Cash outflow operating cost in year 4 = $7000 \times (1.06)^4$ = \$8,837.

Present value of year 4 net cash flow = $(24310 – 8837)/1.15^4$ = \$8,847.

Net present value in year 0

The net present value, NPV = 10726 + 8847 – 9500 = \$10,073.

A2. *Given:* Equipment cost, I_0 = \$7.2 million, Tax rate, t_c = 30%, Cost of capital, r_O = 9%.

Option A

Depreciation tax shield = (7.2/10)(0.3) = \$0.216*m*.

$$PV_0 = \left(\frac{0.216}{0.09}\right)\left[1 - \frac{1}{(1+0.09)^{10}}\right] = 1.386m.$$

Option B

Depreciation tax shield = (7.2/5)(0.3) = \$0.432 million.

$$PV_0 = \left(\frac{0.432}{0.09}\right)\left[1 - \frac{1}{(1+0.09)^{5}}\right] = 1.68m.$$

Option C

Present value of depreciation tax shield = (7.2)(0.3) = \$2.16*m*.

Part II – Submission of Answers Not Required

B. Short Answer Questions

B1. a) Interest expense should be ignored and should not be treated as a cash outflow.

b) If an investment is sold for more (less) than its book value, then the firm has a capital gain (loss).

c) Incremental cash flows matter because the project evaluator is looking at what will change if the project is accepted.

d) Sunk costs should not be included in a cash flow analysis. These are costs that have already been paid. Opportunity costs are relevant and should be included in the cash flow analysis.

e) Cannibalization is the "substitution effect" that frequently occurs when a firm introduces a new product.

B2. a) True.

b) False. The weighted average cost of capital reflects the optimal mix of debt, equity and other financing instruments used by the firm.

c) False.

C. Problems

C1. The incremental earnings (or net operating income) $25.2 million in year 1 and $61.6 million in year 2. The net after-tax cash flows (or free cash flows) are $35.2 million in year 1 and $65.6 million in year 2.

C2. a) Using the common terminal date of 4 years, the *NPV* of project A is –$73,813 and that of B is –$70,529.

b) Using the constant chain of replacement assumption and the perpetuity method, the *NPV* of machine A and its replacement is –$232,856 and that of B and its replacements is –$222,498.

C3. a) The costs of the capital components are as follows:

The cost of debt is the yield to maturity is given as 15%. The market price of the bonds is $88.65 and the market value of the bonds is $1,063,800.

The cost of preference shares is 16% and their market value is $875,000.

The cost of ordinary shares is 21% and their market value is $6,120,000.

The firm's weighted average cost of capital is 19.66%.

b) The revised r_E is 19.4% and the revised weighted average cost of capital is 18.45%.

c) STR can use the weighted average cost of capital if the project will not alter the firm's business or financial risk.