iGave Development Office

CV4107 Engineering econs & finance

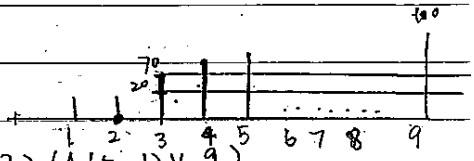
1a) Project A

$AW_A = -290000(A/P, 12\%, 9) + 60000 + 20000(F/A, 12\%, 4)(A/F, 12\%, 9)$

$= -290000(0.18768) + 60000 + 20000(4.7793)(0.06768)$

$= \$2042.06$

Project B



$AW_B = -270000(A/P, 12\%, 9) + 50000 + 20000(F/A, 12\%, 7)(A/F, 12\%, 9)$

$+ 5000(F/G, 12\%, 7)(A/F, 12\%, 9)(P/G, 12\%, 7)(P/F, 12\%, 1)(A/P, 12\%, 9)$

$= -270000(0.18768) + 50000 + 20000(10.0890)(0.06768) + 5000(2.2107 \cdot 11.6443)(0.06768)$

$= \$21693.98$

Project C

$AW_C = -320000(A/P, 12\%, 9) + 80000 + [10(P/F, 12\%, 2) + 10(P/F, 12\%, 4) + 10(P/F, 12\%, 6) + 10(P/F, 12\%, 8)][(A/P, 12\%, 9)]$

$= -320000(0.18768) + 80000 + (10(0.7972) + 10(0.6355) + 10(0.5066) + 10(0.4039))(0.18768)$

$= \$19946.80$

∴ Select Project B.

Assumptions: 1) Service provided by alternatives are needed for LCM of years or more (repeatability)

2) Alternatives will be repeated over each life cycle of the LCM.

3) Cashflow estimates will be the same in every life cycle.

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1b) Cost of capital is the sum required to commence a project. It is dependent on the funding decisions made by the companies.

Two general funding methods:

① Debt financing
- Borrowed from external sources

② Equity financing
- Uses company's own funding.

If debt financing is adopted, cost of capital results from the interest charged on borrowing

If equity financing is adopted, cost of capital stems from the opportunity cost of missed alternatives.

If both methods are used, weighted average cost of capital can be calculated (proportional to % of each financing method).

1c) Effective interest = $(1.02)^2 - 1 = 4.04\%$

Amt needed in 2021 (start) for perpetuity = $100000 + \frac{100000}{0.0404} = 2575247.53$

Amt available in 2016 (start) = $3000000(F/P, 4\%, 5) - 100000(F/P, 4\%, 2) - 10000(F/P, 4\%, 1) - 100000 - 1000000$

$= 3000000(1.2167) - 100000(1.0816) - 100000(1.0400) - 100000 - 1000000$

$= 2337940.$

$\therefore 2337940.(r)^5 = 2575247.53$

$r = 1.01952$

$y = r - 1 = 1.952\%$

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2a) Investment A :

$ROR = \frac{500000(12.5) + 200000(7.5)}{700000} = 11.07\%$

Investment B :

ROR = 10.5%

(select A.)

2b) Incremental cost

First cost : $30000 - X$

return : 4000

For B to be more attractive,

① ROR < MARR

② PW/AW < 0. at MARR.

$\therefore -(30000 - X) + 4000(P/A, 10\%, 5) < 0.$

$-30000 + X + 4000(3.7908) < 0$

$X < 14836.80.$

Since this is a revenue investment, check against do-nothing incremental cost.

First cost : X

return : 6000

For B to be more attractive, PW > 0,

$-X + 6000(3.7908) > 0$

$X < 22744.80.$

$\therefore X < 14836.80.$ #

i) Straight line

ii) $SOYD = \frac{5 \cdot 6}{2} = 15.$

n	Depreciation	BV
0		50000
1	8000	42000
2	8000	34000
3	8000	26000
4	8000	18000
5	8000	10000

n	Depreciation	BV
0		50000
1	13333.33	36666.67
2	10666.67	26000
3	8000	18000
4	5333.33	12666.67
5	2666.67	10000

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3a iii) DB ; DR = 20%

a iv) DR = $\frac{2}{5}$ = 40%.

h	Depreciation	BV
0		50000
1	10000	40000
2	8000	32000
3	6400	25600
4	5120	20480
5	4096	16384

h	Depreciation	BV
0		50000
1	20000	30000
2	12000	18000
3	7200	10800
4	800	10000
5	0	10000

Loss on disposal = 6384.

3b)

Year	Before Tax CF	Depreciation	TI	Tax	Net CF
0	-600000		-600000	+12000	-588000
1	240000	183333.33	56666.67	-19833.33	+220166.67
2	220000	146666.67	73333.33	-25666.67	+194333.33
3	200000	110000	90000	-31500	+168500
4	180000	7333333	106666.67	-37333.33	+142666.67
5	160000	36666.67	123333.33	-43166.67	+116833.33
SV	50000				+50000.

$PW = -588000 + \frac{220166.67}{1.15} + \frac{194333.33}{1.15^2} + \frac{168500}{1.15^3} + \frac{142666.67}{1.15^4} + \frac{116833333}{1.15^5} + \frac{50000}{1.15^5}$

$= \$7425.99 > 0$.

∴ It is worthwhile.

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4a). A financial manager as the title suggests, makes financial decisions for a company. He helps to make informed choice on investment decisions through evaluation of economic worth. He also helps to obtain the most worthwhile fundings to finance projects that the management intends to embark on. In the case of a public listed company, he exerts his influence over the stocks and shares of the company too.

Four major financial decisions:

(1) Capital Rationing Decision : How much funds available for investment
How to obtain funds — through internal funds / borrowed funds

(2) Financing Decision: What financial instruments to use — Shares, bonds etc
Loans — long term / short term.

(3) Investment Decision: Identify profitable investments
Depends on funds available
Acceptance based on rate of return.

(4) Capital Market Decision: Individuals and organisations with cash and are willing to invest

* Not very sure how the answer should be like, check w the profs!

4b) Financial Assets: Means of transferring funds
Exchange & transfer of funds to induce economic growth.

Financial Market : A place where financial instruments / assets can be sold / exchanged

Examples of financial assets: stocks, preferred stocks, bonds.

→ reduced risks

→ reduced ROI

* Check with profs again!

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40) interest = 0.5 × 10% × 120000 = 6000 semiannually [BOND]

required ROR = 0.5 · 8% = 4%

$P = 6000 (P/A, 4\%, 30) + 120000 (P/F, 4\%, 30)$

$= 6000 (17.2920) + 120000 (0.3083)$

$= 140748.$

$P = \frac{7000 (1 + 0.02)}{0.06} = 119000.$ [STOCKS]

∴ Select Bond!

Good luck.

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