BUSS207

Assignment 4

1. WACC = $(.7/1.7)(.06) + (1/1.7)(.16) = 11.88\%$
   project discount rate = $11.88\% + 2.00\% = 13.88\%$
   NPV = $-$ PV(cost) + PV (inflows); PV (inflows)= $[\$6M/(.1388 - .03)] = \$55,147,059$
   The project should only be undertaken if it's the present value of all cost is less than $55,147,059.

2.
   A: Payback = $2 + (\$5,000 / \$10,000) = 2.50$ years

   B: Payback = $3 + (\$12,000 / \$500,000) = 3.024$ years
   Using the payback criterion and a cutoff of 3 years, accept project A and reject project B.

   The followings are the cash flows from each project in present value terms.

Year	Cash Flow A	Cash Flow B
0	-$50,000.00	-$70,000.00
1	$28,301.89	$7,547.17
2	$13,349.95	$17,799.93
3	$8,396.19	$25,188.58
4	$7,920.94	$396,046.83

Therefore,

   A: Discount Payback = $2 + (\$8,348.17 / \$8,396.19) = 2.99$ years
   B: Discount Payback = $3 + (\$19,464.32 / \$396,046.83) = 3.05$ years

   Using the discount payback criterion and a cutoff of 3 years, accept project A and reject project B.

3. Terminal value of inflows = $2,862*(\text{FVIF}_{8\%, \text{3yrs}}) + 5,700*(\text{FVIF}_{8\%, \text{1yrs}}) = \$9,761.30$

   PV(Cash outflows) = $504 + 6,070*(\text{PVIF}_{8\%, \text{2yrs}}) + 1,000*(\text{PVIF}_{8\%,\text{4yrs}}) = \$6,443.08$

   Find the discount rate that satisfies the following:

   PV(Cash outflows) = PV(Terminal value of inflows), or
   $\$6,443.08 = \$9,761.30 \,(\text{PVIF}_{k\%,\text{4yrs}})$
   $k = 10.94\%$

   Since the MIRR is greater the cost of capital, we should take the project.

4. PV of cash inflows = $C_1/(k - g) = \$40,000/(.14 - .07) = \$571,428.57 > 0$

NPV of the project = –$650,000 + $571,428.57 = –$78,571.43 < 0 so don't start cemetery business.

PV of cash inflows = $C_1/(k – g)$ = $40,000/(.14 – .07) = $571,428.57 > 0

NPV of the project = –$650,000 + $571,428.57 = –$78,571.43 < 0 so don't start cemetery business.

5. The $6 million cost of the land 3 years ago is a sunk cost and irrelevant; the $9.25M appraised value of the land is an opportunity cost and is relevant.

    a. Assuming that the firm will need to raise all $14.9 million by the retained earnings, CF_0 = -$24.15 (= opportunity cost of land + building cost + initial operational cost)

    b. Since the company will use the retained earnings, using CAPM, WACC = Ks = 0.05 + 1.4(0.08) = 16.2%. But the project is riskier than the overall company. So WACC* = 16.2% + 2% = 18.2%

    c. Since the company is using the straight line method, the annual depreciation amount will be ($14M - $5M)/5 years = $1.8 M per year.

    d.

Year	1	2	3	4	5
Unit Sale	10,000	10,000	10,000	10,000	10,000
Sales ($10,400 per unit)	$ 104,000,000	$ 104,000,000	$ 104,000,000	$ 104,000,000	$ 104,000,000
-COGS	$ (85,000,000)	$ (85,000,000)	$ (85,000,000)	$ (85,000,000)	$ (85,000,000)
-Depr.	$ (1,800,000)	$ (1,800,000)	$ (1,800,000)	$ (1,800,000)	$ (1,800,000)
Fix Costs	$ (350,000)	$ (350,000)	$ (350,000)	$ (350,000)	$ (350,000)
EBT	$ 16,850,000	$ 16,850,000	$ 16,850,000	$ 16,850,000	$ 16,850,000
-Tax (35%)	$ (5,897,500)	$ (5,897,500)	$ (5,897,500)	$ (5,897,500)	$ (5,897,500)
Net Income	$ 10,952,500	$ 10,952,500	$ 10,952,500	$ 10,952,500	$ 10,952,500
+Depr	$ 1,800,000	$ 1,800,000	$ 1,800,000	$ 1,800,000	$ 1,800,000
OCF	$ 12,752,500	$ 12,752,500	$ 12,752,500	$ 12,752,500	$ 12,752,500

Additional Terminal Cash flow = $5,000,000 (salvage value) - $0 (Tax on salvage value) + $9,250,000 (Recovery of opportunity cost) = $14,250,000

    e.

Year	Cash Flow	
0	–$24,150,000	IRR = 49.68% => Take it!
1	$12,752,500	NPV = $21.73M => Take it!
2	$12,752,500	discount rate = WACC* = 18.2%
3	$12,752,500	
4	$12,752,500	
5	$27,002,500 (= 12,752,500 + 14,250,000)	

Or alternatively, if you consider $900,000 of additional operational cost as a part of NWC, we will be able to recover this amount at the end of project's life. Thus Terminal Cash flow will be $15,150,000. Then

Year	Cash Flow	
0	–$24,150,000	IRR = 49.98% => Take it!
1	$12,752,500	NPV = $22.12M => Take it!
2	$12,752,500	discount rate = WACC* = 18.2%
3	$12,752,500	
4	$12,752,500	
5	$ 27,902,500 (= 12,752,500 + 15,150,000)	