FI 410   **Dr. Anup Agrawal**
Intermediate Financial Management

Test 1 (Practice)

Instructions: Answer all questions. Show all work. There is partial credit for method.

1. a. Calculate the net present value of the following project for discount rates of 0, 50, and 100%:

Cash Flows ($)

C0	C1	C2
-6,750	+4,500	+18,000

b. What is the IRR of the project?

2. A project requires an initial investment of $100,000 and is expected to produce a cash inflow before tax of $26,000 per year for five years. Company A has substantial accumulated tax losses and is unlikely to pay taxes in the foreseeable future. Company B pays corporate taxes at a rate of 35% and can depreciate the investment for tax purposes on a straight-line basis over the project life. Suppose the opportunity cost of capital is 8%. Ignore inflation. Calculate the project's NPV for each company.

3. You are given the following information for Golden Fleece Financial:

Long-term debt outstanding	$300,000
Current yield to maturity (r debt)	8%
Number of shares of common stock	10,000
Price per share	$50
Book value per share	$25
Expected rate of return on stock (r equity)	15%

Calculate Golden Fleece's company cost of capital. Ignore taxes.

4. Consider two mutually exclusive projects, both requiring an initial investment of $9,000 and a cost of capital of 10%. Project A generates cash inflows of $6,000, $5,000 and $4,000 in years 1, 2 and 3, respectively. Project B generates an annual perpetuity of $1,800 starting in year 1 (i.e., $1,800 per year forever). Suppose the forecasted cash flows for projects of this type are overstated by 8% on average (i.e., the forecast for each cash flow from each project should be reduced by 8%). But a lazy financial manager, unwilling to take the time to argue with the projects' sponsors, instructs them to use a discount rate of 18%.

a. What are the projects' true NPVs?

b. What are the NPVs at the 18% discount rate?

c. Does the short-cut method of using an 18% discount rate lead to a wrong decision? Explain briefly.

5. The authorized share capital of the Alfred Cake Company is 100,000 shares. The equity is currently shown in the company's books as follows:

Common stock ($.50 par value) $40,000

Additional paid-in capital   10,000

Retained earnings   30,000

Common equity   80,000

Treasury stock (2,000 shares)   5,000

Net common equity $75,000

a. How many shares are issued?
b. How many are outstanding?
c. Explain the difference between your answers to (a) and (b).
d. How many more shares can be issued without the approval of shareholders?
e. Suppose that Alfred Cake issues 10,000 shares at $2 a share. Which of the above figures would be changed?
f. Suppose instead that the company bought back 5,000 shares at $5 a share. Which of the above figures would be changed?

6. You need to choose between making a public offering and arranging a private placement. In each case the issue involves $10 million face value of 10-year debt. You have the following data for each:

• A public issue: The interest rate on the debt would be 8.5%, and the debt would be issued at face value. The underwriting spread would be 1.5%, and other expenses would be $80,000.

• A private placement: The interest rate on the private placement would be 9%, but the total issuing expenses would be only $30,000.

a. What is the difference in the proceeds to the company net of expenses?

b. Other things being equal, which is the better deal?

c. What other factors beyond the interest rate and issue costs would you wish to consider before deciding between the two offers?

FORMULAE

1. a. $NPV = C_0 + C_1/(1+k) + C_2/(1+k)^2 + \ldots + C_T/(1+k)^T$,

where   k = cost of capital

C_t = Cash flow at time t

T = project life (number of periods)

b. IRR = k, at which NPV = 0.

c. Profitability Index, PI = (Investment + NPV) / Investment

d. Equivalent annual cost, EAC = Investment / $PVA_{T,k}$

where $PVA_{T,k}$ = PV of an annuity of \$1 per year for T years at a discount rate k.

2. CAPM: $E_i = r_f + \beta_i (E_m - r_f)$,

where E_i = Expected return on asset i

E_m = Expected return on the market portfolio

r_f = the riskfree rate

β_i = the systematic risk of asset i

3. $\beta_{asset} = (D/V)\ \beta_{debt} + (E/V)\ \beta_{equity} + (P/V)\ \beta_{Pfd}$

where   V = market value of the firm = D + E + P

D = market value of debt

E = market value of equity

P = market value of preferred stock

4. Value of a right, $p_r = (p_b - p_o)/(n+1)$,

where p_b = stock price before the rights issue

p_o = offer price

n = number of shares needed to buy one new share

5. Stock price after the rights issue, $p_a = p_b - p_r$

6. Under cumulative voting, the number of shares, n, needed to elect d directors, when there are D directors to be elected and N shares outstanding, is

$$n = [Nd/(D+1)] + 1$$

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Solutions to Test 1 (Practice)

1. a. $NPV_{0\%} = \$15,750$ $NPV_{50\%} = \$4,250$ $NPV_{100\%} = 0$

b. $IRR = 100\%$

2. $NPV_A = -100 + 26\ PVA_{5,8\%} = \$3.8105\ K$
$\quad\quad\quad\quad\quad\quad\quad \hookrightarrow 3.9927$

$NPV_B = -100 + 26\ PVA_{5,8\%} - .35(26-20)\ PVA_{5,8\%} = -\$4.5742\ K$

3. $k_{co.} = k_D \cdot \dfrac{D}{V} + k_E \cdot \dfrac{E}{V} = 8\left(\dfrac{300}{300+500}\right) + 15\left(\dfrac{500}{800}\right) = 3 + 9.375$
$\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad = 12.375\%$

4. a. $NPV_A = -9 + .92\left[6\ PV_{1,10\%} + 5\ PV_{2,10\%} + 4\ PV_{3,10\%}\right] = \cancel{\$2.9762\ K}$
$\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad \$2.5847\ K$

$NPV_B = -9 + \dfrac{.92(1.8)}{.1} = \$7.56\ K$

b. $NPV_A = -9 + 6\ PV_{1,18\%} + 5\ PV_{2,18\%} + 4\ PV_{3,18\%} = \$2.11\ K$

$NPV_B = -9 + \dfrac{1.8}{.18} = \$1\ K$

c. The short-cut method suggests that project A should be preferred, when its true NPV is lower than that of B.

5. a. $\dfrac{80}{5} = 40K$ ~~b. 40-2=~~

5. a. $\dfrac{40}{.5} = 80K$ **b.** $80 - 2 = 78\ K$

c. 2,000 shares were bought back and are held as Treasury stock.

d. $100 - 80 = 20\ K$

	e.	**f.**
	$K	
Common stock	45	40
+ Addn'l. paid-in capital	25	10
+ Retained earnings	30	30
= Common equity	100	80
− Treasury stock	5	30
= Net common equity	95	50

6. a. Net Proceeds $_{Public}$ = 10,000 − 150 − 80 = $9,770 K

   " $_{Pvt.}$ = 10,000 − 30 = $9,970 K

   ∴ Net proceeds of pvt. placement are higher by $200 K

   b. PV of extra interest on pvt. placement = .005 (10,000) PVA$_{10,8.5\%}$

   $$= \$328.07 K \qquad ↳ 6.5613$$

   ∴ Pvt. placement is more expensive.

   c. Privately placed debt can be custom-tailored and its terms can be renegotiated more easily.