AP/ADMS4540 3.0

Assignment #2

Summer 2013

Instructions:

(1) This assignment is to be done individually. You must sign and submit the standard cover page supplied as the last page of this assignment.

(2) Before you start, please note the necessary working steps to be shown as explained in the first lecture.

(3) This assignment is due on Monday, July 29, 2013, in Atk 282 by 7pm for all sections.

(4) This assignment must be handwritten. Any work that is not original handwritten (e.g., printed or photocopied) will receive zero credit. Work that is too difficult to read due to messiness and poor handwriting will also receive zero credit. You must show all the necessary working steps to receive full credit.

(5) This assignment carries a total of 100 marks. Each question is worth 25 marks.

(6) Late assignments will not be accepted whether for technical or any other reasons except for illness. A student must submit an Attending Physician's Statement as evidence of illness if the student has received prior written permission from the course director to submit a late assignment. Under no circumstances would a late assignment be accepted after the answer key to the assignment has been posted on the course website.

(7) Decimal places: please keep at least 8 in your calculations and round to the nearest penny or basis point in your final answers.

Question 1

Sharpe company plans to buy or lease an equipment. The purchase price is \$800,000 and the equipment will be depreciated at \$80,000 per year for tax purposes. The equipment could be sold in nine years for \$80,000. If the firm leases the equipment under an operating lease, it pays annual lease payments of \$40,000 at the beginning of each of nine years. The firm's effective tax rate is 40 %. Should the firm lease or buy if the after tax cost of borrowing is 8 percent?

Solution:

NPV (leasing) = CF0 (purchase price savings) – PV(foregone depreciation tax savings) – PV(foregone salvage value) – PV(after-tax lease payments)

CF0 = \$800,000;

Depreciation tax savings = 0.40 × \$80,000 = \$32,000 per year.

After-tax cost of borrowing = 8%

PV(Depreciation tax savings) = 32,000 × $\left[\frac{1-\frac{1}{(1.08)^9}}{.08}\right] = \$199,900$

Or, using financial calculator:

N = 9; I/Y = 8%; PMT = \$32,000; FV = 0; CPT PV = \$199,900

PV(Salvage value) = 80,000 × $\left[\frac{1}{(1.08)^9}\right] = \$40,020$

Or, using financial calculator:

N = 9; I/Y = 8%; PMT = 0; FV = 80,000; CPT PV = \$40,020

PV(after-tax lease payments)

$$= 40{,}000(1 - 0.4) \times \left[\frac{1 - \frac{1}{(1.08)^9}}{.08}\right] \times (1.08) = \$161{,}919$$

Or, using financial calculator:

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N = 9; I/Y = 8%; PMT = $24,000; FV = 0; CPT PV = $161,919

NAL (leasing)

= CF0 – PV(foregone depreciation tax savings) – PV(foregone salvage value) – PV(after-tax lease payments)

= 800,000 – 199,900 – 40,020 – 161,919 = +$398,161 > 0

The firm should lease the equipment instead of purchasing it.

Question 2

1) The finance manager at Prentice Hall Publishers is considering a new investment project for the firm which will have, in her opinion, the following as the most likely outcome:

Variable cost	Fixed cost	Expected sales
$30	$300,000	30,000 units per year

However, she recognizes that these estimates may be subject to error, and thinks that these variables may vary by either +/-15% from the initial estimate. The project will last for 5 years, and requires an initial investment of $1.5million, which will be depreciated straight line over the life of the project. There will be no salvage value on the initial investment. The selling price is expected to be $50 for each unit produced. The firm's tax rate is 25% and the required rate of return is 15%.

a) What are the possible range of values for variable costs, fixed costs and expected sales?
b) What is the project NPV in all possible cases?

Solution

a)

Scenario	Variable cost	Fixed cost	Expected sales
Best case	25.5	255,000	34,500
Base case	$30	$300,000	30,000 units per year
Worst case	34.5	345,000	25,500

b)

Using the tax shield approach, the OCF and NPV for the base case estimate is:
OCFbase = [($50 – 30)(30,000) – $300,000](0.75) + 0.25($1,500,000/5)
OCFbase = $300,000
NPVbase = –$1,500,000 + $300,000(PVIFA15%, 5)
NPVbase = -1,500,000 + 1,005,660 = ($494,340)

The OCF and NPV for the worst case estimate is:
OCFworst = [($50 – 34.5)(25,500) – $345,000](0.75) + 0.25($1,500,000/5)
OCFworst = $112,688
NPVworst = –$1,500,000 + $112,688 (PVIFA15%, 5)
NPVworst = -1,500,000 + 377,751 = ($1,122,249)

The OCF and NPV for the best case estimate is:
OCFbest = [($50 – 25.5)(34,500) – $255,000](0.75) + 0.25($1,500,000/5)
OCFbest = $517,688
NPVbest = –$1,500,000 + $517,688(PVIFA15%, 5)
NPVbest = -1,500,000 + 1,735,393 = $235,393

2) Dime a Dozen Diamonds makes synthetic diamonds by treating carbon. Each diamond can be sold for $100. The materials cost for a standard diamond is $30. Fixed costs incurred each year are $200,000. The machinery costs $1million and is depreciated straight line over 10 years to a salvage value of zero.
   a) What is the accounting break even level of sales in terms of diamonds sold?

   Solution:
   a) Accounting break even = (FC + D)/(P – v)
   = [$200,000 + ($1,000,000/10)]/($100 - $30)
   = 4,285.7

3) You estimate that your farm will generate $4million in sales, with $1 million profits; and that the degree of operating leverage is 1.5. What will profits be if sales turn out to be $3.5million? What if they are $4.5million?

   Solution:

DOL = % change in profits/% change in sales → % change in profits = DOL * % change in sales
If sales turn out to be $3.5million, this is a -12.5% change in sales. Therefore % change in profits will be 1.5*12.5% = 18.75% → and profits will be $1,000,000* (1- 0.1875) = $812,500
If sales turn out to be $4.5million, this is a +12.5% change in sales. Therefore % change in profits will be 1.5*12.5% = 18.75% → and profits will be $1,000,000*(1+ 0.1875) =1,187,500

Question 3

M & A Question
Dallas Inc. is analyzing the possible acquisition of OCP Inc. Both firms have no debt. Dallas believes the acquisition will increase its total after-tax annual cash flows by $5.88 million indefinitely. The appropriate discount rate for the incremental cash flows is 14 percent. Dallas has 6 million shares outstanding at a current market price of $48 per share. OCP has 5 million shares outstanding at a current market price of $30 per share. Dallas and OCP have agreed on a transaction value of $32 per share for OCP's stock, but are negotiating methods of payment: an all-cash offer, a stock exchange offer, as well as a combination of cash and stock exchange offer ($10.4 cash per share of OCP plus 0.45shares of Dallas per share of OCP).
a. Calculate the takeover premium of each alternative.
b. Calculate the NPV of each alternative. Which alternative should Dallas use?
c. What is the maximum cash price per share that could be paid for OCP?
d. Suppose Dallas increases its offer from $32 to $33.5 per share for OCP's stock. Calculate the break-even synergy for cash offer.

Solution:
a.
Synergy = 5.88 million/14% = $ 42 m
The pre-merger value of Dallas Inc. $V_A = 48 \times 6$ m = $288 m
The pre-merger value of OCP Inc. $V_T = 30 \times 5$ m = $150 m
All-Cash offer:

$P_T = 32\times 5$ m = $160m
Takeover Premium = $P_T - V_T$ = 160 m – 150 m = $10m

Stock Exchange offer:

$V_{AT} = V_A + V_T$ + Synergy – Cash = 288 m+ 150m + 42m – 0 = $480m
Need to calculate the number of new shares
Exchange ratio: 48/32 = 1.5 (One share of Dallas for 1.5 shares of OCP.)
Since there are 5m shares of OCP outstanding, Dallas must issue
5m / 1.5 = 3.333333 m new shares.

Or let n= # of new shares
$48* n = $32 * 5m
n =3.333333 m new shares

The total shares outstanding for Dallas is 6m + 3.333333m = 9.33333m

The price per share for the combined company

$P_{AT} = V_{AT}$ / 9.333333m = 480 m / 9.33333m = \$51.43

The actual price paid to OCP is

P_T = 3.333333m × P_{AT} = 3.33333m × \$51.43 = \$171.43316 m

Takeover Premium = $P_T - V_T$ = \$171.43316 m – 150 m = \$21.43316m

Cash and Stock Exchange offer:

$V_{AT} = V_A + V_T$ + Synergy – Cash = 288 m+ 150m + 42m – 10.4 × 5 m = \$428m

Since there are 5m shares of OCP outstanding, Dallas must issue

5m × 0.45 = 2.25 m new shares.

The total shares outstanding for Dallas is 6m + 2.25m = 8.25m

The price per share for the combined company

$P_{AT} = V_{AT}$ / 8.25m = 428m / 8.25m = \$51.88

The actual price paid to Silicon (target) is

P_T = 2.25m × P_{AT} + Cash = 2.25m × \$51.88+ 10.4 × 5 m = \$ 168.73m

Takeover Premium = $P_T - V_T$ = 168.73m – 150 m = \$18.73m

b.

All-Cash offer:

NPV= Gains to Dallas = S-TP = 42m – 10m = \$32m

(or NPV = (S + V_T) – P_T = (42m + 150m) - 160 m = \$32m)

Stock Exchange offer:

NPV= Gains to Dallas = S-TP = 42m – 21.43316m = \$20.56684m

(or NPV = (S + V_T) – P_T = (42m + 150m) - 171.43316 m = \$20.56684m)

Cash and Stock Exchange offer:

NPV= Gains to Dallas = S-TP = 42m – 18.73m = \$23.27m

(or NPV = (S + V_T) – P_T = (42m + 150m) - 168.73m = \$23.27m)

Dallas should use an all-cash offer since its NPV is the greatest in the three methods of payment.

c.

The maximum cash price per share for OCP that should be paid is the existing share price plus the synergy per share:

Maximum share price = \$30 + (\$42m /5m) = \$38.40

d.

The break –even Syngergy=TP = $P_T - V_T$ = 33.5× 5 m – 150 m = 167.5 m – 150 m = \$17.5m

Question 4 – Risk and Return

A. Watching Youtube Videos: Watch the following Youtube videos on your PC or laptop or mobile device and then write up a two-page summary of what you learnt from these Youtube videos. There will not be an answer key provided for this question. Instead, the markers will also have watched these videos, and if what you write of these videos is consistent with their understanding and different from other students, you will receive full credit. (10 marks)

Bear Stearns is fine?

http://www.youtube.com/watch?v=HPc16cuQJR0

Lessons from the father of modern portfolio theory

http://www.youtube.com/watch?v=5Y1MBc_Vj3w

There are no shortcuts to investing: Nobel laureate William Sharpe

http://www.youtube.com/watch?v=pGIzygsvqck

B. With the last decade experiencing the highest stock market volatility, you are considering the one safe investment – beer. In particular, you are thinking of investing in Deerhead Brewery. Deerhead's current dividend is $3.75 and is expected to grow at an EAR of 15 percent forever. Suppose that the annual return on a risk-free government bond will remain at 10 percent and the annual return on a market-based portfolio of stocks will remain at 18 percent.

a. If Deerhead has a beta coefficient of 1.5, calculate the current price of a share of Deerhead stock. (5 marks)

b. One day, you receive a call from your broker. Deerhead is about to launch an advertising blitz with the jingle the deer beer that's not too dear – it only costs a buck and that's not a lot of doe. This advertising blitz is expected to increase dividends at an EAR of 20 percent for the next 6 years and 15 percent thereafter. What is the price of a share of Deerhead stock now? How much should Deerhead's shareholders be willing to pay for this advertisement? (10 marks)

Solution:

Points in []

a. The required rate of return on Deerhead stock $r = r_f + \beta\ (r_m - r_f) = 10+1.5\ (18 - 10) = 22\%$ [1]

Since the current dividend is $3.75, which means that the next dividend is 3.75 * (1+15%) = 4.31

Hence the current price of a share of Deerhead stock $P = D_1 / (r-g) = 4.31/(0.22-0.15) = 61.61$ [2]

b. Dividend payment 7 years from today = $3.75 * 1.2^{6} * 1.15 = 12.88$

Price per share of Deerhead stock 6 years from today= $P_6 = D_7/(r-g) = 12.88/(0.22-0.15) = 183.96$ [2]

PV today of $P_6 = 183.96/1.22^6 = 55.79$ [2]

Dividend payment one year from today = $D_1 = 1.2 * 3.75 = 4.50$

PV today of dividents for next 6 years = $D_1 * [\frac{1-\left(\frac{1+g}{1+r}\right)^6}{r-g}] = 4.50 * \left[\frac{1-\left(\frac{1.2}{1.22}\right)^6}{0.22-0.2}\right] = 21.24$ [3]

Price of Deerhead stock today = 55.79 + 21.24 = 77.03 [1]

The increase in price is $77.03 – 61.61 = $15.42 per share. Therefore the shareholders shpould be willing to pay at most $15.42 times the numbers of shares outstanding for this advertisment. [2]

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ADMS 4540

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Due date for all sections 29 Jul, 2013 in Atk 282 by 7 pm

Personal Work Statement

I, the undersigned:

- **Warrant that the work submitted herein is my work and not the work of others**
- **Acknowledge that I have read and understood the Senate Policy on Academic Honesty**
- **Acknowledge that it is a breach of the University regulations to give and receive unauthorized assistance on a graded piece of work**

Name (typed or printed)	York Student #	Signature