

Student Name: _____

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Problem set 3

1. Ludden Enterprises is a publicly traded firm in two businesses: the casino business, having a market value of \$ 500 million, and the catering business, having a market value of \$ 500 million as well. There are 60 million shares outstanding trading at \$ 10 per share and \$ 400 million in debt outstanding. The marginal tax rate is 40%. You have estimated the regression beta, based on historical data (over the last 5 years), equal to 1.20 that you believe to be a good measure of the equity risk over the period.
- If the average debt to equity ratio over the 5-year period was 50%, estimate the unlevered beta for Ludden Enterprises. (2 points)
 - The firm plans to sell 50% of the catering business (\$250ml) and use the proceeds from the sale to pay down debt. The unlevered beta for casinos business is 1,2 and the unlevered beta for catering business is 0,64. Estimate the new unlevered beta and the new equity (levered) beta after this transaction. (3 points)

a. Levered beta =	1,2		
Average D/E ratio over period=	50%		
Tax rate =	40%		
Unlevered beta = $1,2/(1+(1-0.4)*0.5)$			0,92
b. New weights			
	New value	Weights	Unlevered beta
Casino	500	0,6666666 7	1,2
Catering	250	0,3333333 3	0,64615385
			$!1.2*0.66+0.6461*0.3$
New unlevered beta =			1,01538462
New Debt =	150		
New Equity	600		
New D/E ratio = 150/600	0,25		
New levered beta =			1,1676923
			$! 1.01538 * (1+(1-.40)(.25))$

2. You have been asked to analyze whether Falcon Inc, a computer manufacturer, should invest in producing new software.
- Falcon has already spent \$ 2 million developing pieces of the software (sunk costs); this expense was capitalized and will be depreciated straight line over the next four years.
 - Falcon will have to invest an additional \$ 4 million if it wants to commercially develop the software, and this investment will also be depreciated straight line over four years (depreciation will be 1 ml each year).
 - Based upon a market study, Falcon concludes that it can generate revenues of \$ 6 million every year for the next 4 years; operating expenses (other than depreciation) are expected to be 60% of revenues each year.
 - Falcon has an unlevered beta of 0.90 (bottom-up beta for computer manufacturers) but the unlevered beta for computer software companies is 1.50. The market value of equity for Falcon is \$ 80 million and the market value of debt is \$ 20 million. Falcon plans to maintain this debt to capital ratio for this project. Falcon after-tax cost of debt is 4.2%.

- The riskless rate is 5% and the equity risk premium is 4%. The tax rate is 40%.
 - The new project will not generate any working capital increases/decreases.
- a. Estimate the cost of capital for this project (2 points)
 - b. Estimate the incremental cash flows on this project over the four years (2 points)
 - c. Estimate the net present value of this project (2 points)

a. Cost of Capital:

$K_d = (.05 + .02)(1 - .40) = 4,2\%$

Levered Beta = $1,5 * (1 + (1 - 0,4) * 0,25) = 1,725$ you should use Unlevered beta for software companies

$k_e = 5\% + 1,73 * (4\%) = 11,9$

$wacc = 11,9 * (80/100) + 4,2 * (20/100) = 10,36$

b. Incremental cashflows

	0	1	2	3	4
Initial investment	-4				
Revenues		6	6	6	6
- Operating Expenses		3,6	3,6	3,6	3,6
- Depreciation		1	1	1	1
EBIT		1,4	1,4	1,4	1,4
- Taxes		0,56	0,56	0,56	0,56
EBIT (1-t)		0,84	0,84	0,84	0,84
+ Depreciation		1	1	1	1
Cashflow after taxes		1,84	1,84	1,84	1,84
Cashflow to firm	-4	1,84	1,84	1,84	1,84
PV	-4	1,667271	1,510756	1,368935	1,2404

Do not count depreciation from sunk investment

c. NPV = $4 + 1,84/(1,1036) + 1,84/(1,1036^2) + 1,84/(1,1036^3) + 1,84/(1,1036^4) = 1,787$

3. You have been asked to analyze the capital structure of Ferrero SpA, an Italian food company. The company has supplied you with the following information:
 - There are 50 million shares outstanding, trading at \$ 20 a share

- The firm has debt outstanding of \$ 500 million, in market value terms.
 - The regression beta for the firm currently is 0.90, the riskfree rate is 3% and the market risk premium is 5.5%.
 - The firm's current bond rating is A; the default spread for A rated bonds is 1.5%.
 - The marginal tax rate is 40%.
- a. Estimate the cost of equity (1 point)
 - b. Estimate the current cost of capital for Ferrero SpA. (1 point)
 - b. Now assume that you have computed the optimal debt to capital ratio to be 40%. If the pre-tax cost of debt will rise by 0.25 percentage points (25 basis points) if it moves to the optimal, estimate the new cost of capital at 40%. (3 points)

Problem 1

a. Current Cost of Equity = 7,95% ! 3% + 0.9*(5.5%)
 Current cost of debt = 2,70%
 = (3+1.5)*(1-0.4)

B. Current cost of capital = 6,21% ! 7.95% (.67) + 2.7% (.33)

C. New debt to capital ratio = 40%
 New debt to equity ratio = $40/60 = 0,67$
 $0,9/(1+0,6*(500/1000))$

Unlevered Beta = 0,69
 New Beta = $0,69*(1+0,6*(0,67)) = 0,96$

New cost of equity = $3 + 0,96*(5,5) = 8,28\%$

New after-tax cost of debt = $(4,5+0,25)*(0,6) = 2,85\%$

New Cost of capital = $8,28\%*0,6+2,85\%*0,4 = \span style="border: 1px solid black; padding: 2px;">6,11\%$

! You lost a point if you did not unlever and relever betas

4. Answer true or false to each of the following statements (1 point each)

A. If dividend payments to stockholders are tax deductible to corporations, the optimal debt ratios of these firms will decrease	T
B. An increase in dividends is always a positive signals to the market	F
C. Firms with more uncertainty about future investment needs (both in terms of magnitude and type) should generally borrow more money than firms with less uncertainty	F
D. If there are no tax differences to investors between dividends and capital gains, the dividend policy doesn't affect firm's value	T