

Multiple Choice

1	B	0
2	E	0
3	B	0
4	C	0
5	E	0
6	B	0
7	D	0
8	E	0
9	B	0
10	B	0

Total wrong 0

Points off 0

Problem #1 (10 points)

Calculate the WACC for the following company:

Debt: 125,000 bonds with a par value of \$1,000 and a quoted price of 106.35. The bonds have coupon rate of 5.6 percent paid semiannually and 11 years to maturity. 150,000 bonds with a par value of \$2,000 and a quoted price of 109.65. The bonds have 25 years to maturity.

Common Stock: 8.5 million shares of stock selling at a market price of \$92. The stock has a beta of 1.15. The company just paid a dividend of \$4.10 and the dividends are expected to grow at 5.5 percent forever.

Market: The expected market return is 11 percent and the risk-free rate is 3.1 percent. The company is in the 40 percent tax bracket.

<i>Debt:</i>	Bond 1	Bond 2
Number of bonds	125,000	150,000
Par value	\$ 1,000	\$ 2,000
Par value (% of par)	100	100
Coupon rate	5.60%	6.30%
Quoted price	106.35	109.65
Settlement date	1/1/2000	1/1/2000
Maturity date	1/1/2011	1/1/2025
Coupons per year	2	2

<i>Common stock</i>	
Number of shares	8,500,000
Price	\$ 92.00
Beta	1.15
Current dividend	\$ 4.10
Dividend growth rate	5.50%

<i>Market</i>	
Market E(R)	11.0%
Risk-free rate	3.1%
Tax rate	40%

<i>Debt</i>	Bond 1	Bond 2
YTM	4.85%	5.58%
Aftertax cost	2.91%	3.35%

<i>Cost of equity</i>	
CAPM	12.19%
DDM	10.20%
Average	11.19%

	Market value	Weight
Bond 1	\$ 132,937,500	0.1069
Bond 2	328,950,000	0.2645
Equity	782,000,000	0.6287
Total	\$ 1,243,887,500	1.00

WACC	8.23%
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Problem #2 (10 points)

YOUR NAME HERE

Guentzel Industries is considering the production of a new composite hockey stick. The new stick will sell for \$325 per unit. The equipment necessary for production will cost \$12.5 million and will be depreciated on a 5-year MACRS schedule. In five years, the equipment can be sold for 15 percent of its original cost, although the company will keep the equipment for use in another product line. The projected sales are 75,000, 85,000, 95,000, 80,000, and 65,000 sticks per year for the next five years, respectively. Fixed costs are estimated at \$1.35 million per year. Net working capital of 20 percent of sales will be required to be built up in the year of sale. The company has a tax rate of 40 percent and a required return of 11 percent on new product lines. In the company's analysis, although it has estimated the variable cost per stick, but management is concerned about the accuracy of this number. What is the highest variable cost per stick that would still make the project acceptable?

Price per unit	\$	325				
Equipment	\$	12,500,000				
Depreciation		20.00%	32.00%	19.20%	11.52%	11.52%
Equipment salvage value		15%				5.76%
Units sold		75,000	85,000	95,000	80,000	65,000
Fixed costs	\$	1,350,000				
NWC		20%				
Tax rate		40%				
Required return		11%				

Variable cost per unit \$ 253.81

	<i>Year 0</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>	
Sales		\$ 24,375,000	\$ 27,625,000	\$ 30,875,000	\$ 26,000,000	\$ 21,125,000	
VC		19,035,567	21,573,642	24,111,718	20,304,605	16,497,491	
FC		1,350,000	1,350,000	1,350,000	1,350,000	1,350,000	
Depreciation		2,500,000	4,000,000	2,400,000	1,440,000	1,440,000	
EBT		\$ 1,489,433	\$ 701,358	\$ 3,013,282	\$ 2,905,395	\$ 1,837,509	
Tax		595,773	280,543	1,205,313	1,162,158	735,004	
Net income		\$ 893,660	\$ 420,815	\$ 1,807,969	\$ 1,743,237	\$ 1,102,505	
+Depreciation		2,500,000	4,000,000	2,400,000	1,440,000	1,440,000	
OCF		\$ 3,393,660	\$ 4,420,815	\$ 4,207,969	\$ 3,183,237	\$ 2,542,505	
Equipment book value		\$ 10,000,000	\$ 6,000,000	\$ 3,600,000	\$ 2,160,000	\$ 720,000	
Salvage							
Sell old	\$	1,875,000					
Taxes		(462,000)					
Aftertax salvage value	\$	1,413,000					
Beginning NWC			\$ 4,875,000	\$ 5,525,000	\$ 6,175,000	\$ 5,200,000	
Ending NWC		4,875,000	5,525,000	6,175,000	5,200,000		
NWC CF		\$ (4,875,000)	\$ (650,000)	\$ (650,000)	\$ 975,000	\$ 5,200,000	
Capital spending	\$	(12,500,000)				\$ 1,413,000	
NWC		(4,875,000)	(650,000)	(650,000)	975,000	5,200,000	
OCF		3,393,660	4,420,815	4,207,969	3,183,237	2,542,505	
Total cash flow	\$	(12,500,000)	\$ (1,481,340)	\$ 3,770,815	\$ 3,557,969	\$ 4,158,237	\$ 9,155,505
NPV						\$0.00	

Microsoft Excel 15.0 Answer Report

Worksheet: [FIN 6100 Exam 2 Spring 2017 with answers.xlsx]#2

Report Created: 8/4/2017 2:06:52 PM

Result: Solver found a solution. All Constraints and optimality conditions are satisfied.

Solver Engine

Engine: GRG Nonlinear

Solution Time: 0.015 Seconds.

Iterations: 1 Subproblems: 0

Solver Options

Max Time 100 sec, Iterations 100, Precision 0.000001

Convergence 0.0001, Population Size 100, Random Seed 0, Derivatives Forward, Require Bounds

Max Subproblems Unlimited, Max Integer Sols Unlimited, Integer Tolerance 5%

Objective Cell (Value Of)

Cell	Name	Original Value	Final Value
\$B\$43	NPV Year 0	(\$8,239,571.55)	\$0.00

Variable Cells

Cell	Name	Original Value	Final Value	Integer
\$B\$14	Variable cost per unit	\$ 300.00	\$ 253.81	Contin

Constraints

Cell	Name	Cell Value	Formula	Status	Slack
\$B\$43	NPV Year 0	\$0.00	\$B\$43=0	Binding	0

Problem #3 (13 points)

YOUR NAME HERE

Crosby Corp. has completed and evaluation of a new energy efficient washer-dryer set. The set would currently sell for \$1,200 and have variable costs of \$550 per set. Equipment necessary for production will cost \$28.5 million. Crosby has received a special dispensation that will allow the company to depreciate the equipment on a 3-year MACRS schedule. Six years from now, the equipment will be worth \$750,000. In other words, the company will receive a check for \$750,000 when it sells the equipment. Fixed costs would be \$9.9 million per year in today's dollars. Unit sales are projected to be 15,900, 28,600, 37,500, 41,800, 34,200, and 12,300 units per year. Additionally, the company has overhead of \$20 million per year. The new project will be allocated 7 percent of this cost. The price, variable costs, fixed costs, and overhead are expected to increase at the inflation rate of 3.1 percent. Crosby has a nominal required return of 10 percent and a tax rate of 38 percent. What is the NPV of the new washer-dryer set?

Price	\$	1,200					
Variable cost	\$	550					
Equipment	\$	28,500,000					
Depreciation			Year 1	Year 2	Year 3	Year 4	Year 5
			33.33%	44.45%	14.81%	7.41%	
Equipment salvage	\$	750,000					
Fixed costs	\$	9,900,000					
Quantity per year		15,900		28,600	37,500	41,800	34,200
Corporate overhead	\$	20,000,000					
Overhead percentage		7%					
Inflation		3.1%					
Nominal required return		10%					
Tax rate		38%					

Problem #4 (10 points)

YOUR NAME HERE

Sheary Inc. is in negotiations to purchase Schultz Corp. Unfortunately, Schultz is a private company, so there is no market value for the company, although both companies are in the pet toy industry. Sheary currently has debt outstanding with a market value of \$125 million and a YTM of 5.8 percent. The market value of Sheary stock is \$420 million, and the required return on equity is 11 percent. Schultz currently has debt outstanding with a market value of \$42.5 million. The EBIT for Schultz next year is projected to be \$11.9 million. EBIT is expected to grow at 15 percent, 12 percent, 8 percent, and 6 percent over the following four years before slowing to 3 percent in perpetuity. Net working capital, capital spending, and depreciation as a percentage of EBIT are expected to be 8 percent, 15 percent, and 9 percent, respectively. Schultz has 1.25 million shares outstanding, and the tax rate for both companies is 38 percent. What is the price per share of Schultz stock?

<i>Sheary</i>					
Debt market value	\$	125,000,000			
Cost of debt		5.8%			
Equity market value	\$	420,000,000			
Cost of equity		11%			
<i>Schultz:</i>					
Debt value	\$	42,500,000			
Projected EBIT in one year	\$	11,900,000			
EBIT 5 year growth rate		<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>
		15%	12%	8%	6%
Perpetual growth rate in CF		3%			
Net working capital percentage		8%			
Capital spending percentage		15%			
Depreciation percentage		9%			
Shares outstanding		1,250,000			
Tax rate		38%			

Weight of debt	22.94%
Weight of equity	77.06%
R_{WACC}	9.30%

	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
EBIT	\$ 11,900,000	\$ 13,685,000	\$ 15,327,200	\$ 16,553,376	\$ 17,546,579
Taxes	4,522,000	5,200,300	5,824,336	6,290,283	6,667,700
Net income	7,378,000	8,484,700	9,502,864	10,263,093	10,878,879
Depreciation	1,071,000	1,231,650	1,379,448	1,489,804	1,579,192
OCF	\$ 8,449,000	\$ 9,716,350	\$ 10,882,312	\$ 11,752,897	\$ 12,458,071
- Capital spending	1,785,000	2,052,750	2,299,080	2,483,006	2,631,987
- Change in NWC	952,000	1,094,800	1,226,176	1,324,270	1,403,726
Cash flow from assets	\$ 5,712,000	\$ 6,568,800	\$ 7,357,056	\$ 7,945,620	\$ 8,422,358
Year 6 cash flow	\$ 8,675,028				
Year 5 terminal value	\$ 137,658,771				
Value of company today	\$ 115,564,271				
Value of equity	\$ 73,064,271				
Share price	\$ 58.45				

YOUR NAME HERE

Problem #5 (25 points)

		<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>			
Cost per goat	\$	800							
Goats employed		600	900	1,100	1,400	1,600			
Sales per goat	\$	1,500	\$ 1,525	\$ 1,575	\$ 1,600	\$ 1,650			
Number of herders		4.0	4.5	5.0	5.5	6.0			
Cost per herder	\$	60,000							
Equipment cost	\$	2,650,000							
MACRS depreciation		14.29%	24.49%	17.49%	12.49%	8.93%	8.92%	8.93%	4.46%
NWC		8%							
Fixed costs	\$	275,000							
Consulting costs	\$	75,000							
Existing sales lost	\$	110,000	\$ 140,000	\$ 155,000	\$ 195,000	\$ 240,000			
Existing sales variable cost		45%							
Existing operations fixed cost	\$	325,000							
Perpetual CF growth rate		2.2%							
Weight of debt		25%							
Weight of equity		75%							
Debt floatation costs		3%							
Equity floatation costs		6%							
Internal equity percentage		80%							
Adjustment factor		2.5%							
Manure per goat per year	\$	20							
Gecko project cost	\$	1,400,000							
Gecko project annual CF	\$	250,000							
Gecko project life		10							
Tax rate		40%							
Company WACC		9%							

	Capital	Floatation
	Structure	Costs
Debt	25%	3%
Equity	75%	6%
		1.65%

CF @ time 0 with floatation
Equipment \$ (2,650,000) (\$2,694,459)

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
New sales	\$ 900,000	\$ 1,372,500	\$ 1,732,500	\$ 2,240,000	\$ 2,640,000
Manure sales	12,000	18,000	22,000	28,000	32,000
Lost sales	(110,000)	(140,000)	(155,000)	(195,000)	(240,000)
	<u>\$ 802,000</u>	<u>\$ 1,250,500</u>	<u>\$ 1,599,500</u>	<u>\$ 2,073,000</u>	<u>\$ 2,432,000</u>
VC of goat	\$ 480,000	\$ 720,000	\$ 880,000	\$ 1,120,000	\$ 1,280,000
Cost of herders	240,000	270,000	300,000	330,000	360,000
Saved VC	(49,500)	(63,000)	(69,750)	(87,750)	(108,000)
FC	<u>\$ 670,500</u>	<u>\$ 927,000</u>	<u>\$ 1,110,250</u>	<u>\$ 1,362,250</u>	<u>\$ 1,532,000</u>

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Sales	\$ 802,000	\$ 1,250,500	\$ 1,599,500	\$ 2,073,000	\$ 2,432,000
VC	670,500	927,000	1,110,250	1,362,250	1,532,000
FC	275,000	275,000	275,000	275,000	275,000
Depreciation	<u>378,685</u>	<u>648,985</u>	<u>463,485</u>	<u>330,985</u>	<u>236,645</u>
EBT	\$ (522,185)	\$ (600,485)	\$ (249,235)	\$ 104,765	\$ 388,355
Tax	(208,874)	(240,194)	(99,694)	41,906	155,342
NI	<u>\$ (313,311)</u>	<u>\$ (360,291)</u>	<u>\$ (149,541)</u>	<u>\$ 62,859</u>	<u>\$ 233,013</u>
+Depreciation	<u>378,685</u>	<u>648,985</u>	<u>463,485</u>	<u>330,985</u>	<u>236,645</u>
OCF	<u>\$ 65,374</u>	<u>\$ 288,694</u>	<u>\$ 313,944</u>	<u>\$ 393,844</u>	<u>\$ 469,658</u>

NWC beginning		\$ 64,160	\$ 100,040	\$ 127,960	\$ 165,840
NWC end	64,160	100,040	127,960	165,840	194,560
NWC CF	<u>\$ (64,160)</u>	<u>(\$35,880)</u>	<u>(\$27,920)</u>	<u>(\$37,880)</u>	<u>(\$28,720)</u>
OCF	\$ 65,374	\$ 288,694	\$ 313,944	\$ 393,844	\$ 469,658
NWC CF	<u>(64,160)</u>	<u>(35,880)</u>	<u>(27,920)</u>	<u>(37,880)</u>	<u>(28,720)</u>
NWC CF old	<u>\$ 1,214</u>	<u>\$ 252,814</u>	<u>\$ 286,024</u>	<u>\$ 355,964</u>	<u>\$ 440,938</u>

Project required return 11.50%

Perpetual CF value at Year 5 \$ 4,845,577

Cash Flows	<u>t</u>	<u>CF</u>
	0	\$ (2,694,459)
	1	\$ 1,214
	2	\$ 252,814
	3	\$ 286,024
	4	\$ 355,964
	5	\$ 440,938

PI 1.38
NPV \$1,014,202.11
IRR 14.43%

You cannot use IRR function since the perpetual cash flows are discounted at the required return. Therefore, you must use Solver to find the IRR.

Microsoft Excel 15.0 Answer Report

Worksheet: [FIN 6100 Exam 2 Spring 2017 with answers.xlsx]#5

Report Created: 3/30/2017 2:48:20 PM

Result: Solver found a solution. All Constraints and optimality conditions are satisfied.

Solver Engine

Engine: GRG Nonlinear

Solution Time: 0.063 Seconds.

Iterations: 2 Subproblems: 0

Solver Options

Max Time 100 sec, Iterations 100, Precision 0.000001

Convergence 0.0001, Population Size 100, Random Seed 0, Derivatives Forward, Require Bounds

Max Subproblems Unlimited, Max Integer Sols Unlimited, Integer Tolerance 5%, Solve Without Integer Constraints

Objective Cell (Value Of)

Cell	Name	Original Value	Final Value
\$C\$82	NPV CF	\$1,014,202.12	\$0.00

Variable Cells

Cell	Name	Original Value	Final Value	Integer
\$B\$69	Project required return Year 1	11.50%	14.43%	Contin

Constraints

Cell	Name	Cell Value	Formula	Status	Slack
\$C\$82	NPV CF	\$0.00	\$C\$82=0	Binding	0