

Multiple Choice

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

Number missed 0

Points off 0

YOUR NAME HERE

Problem #1 (10 points)

Calculate the WACC for the following firm:

Debt: 60,000 bonds with a par value of \$1,000 and a quoted price of 108.25. The bonds have coupon rate of 5.15 percent and 18 years to maturity. 45,000 bonds with a par value of \$2,000 and a quoted price of 97.65. The bonds have coupon rate of 6.20 percent and 25 years to maturity. Both bonds make semiannual coupon payments.

Preferred Stock: 100,000 shares of 4.8 percent preferred selling at a price of \$92.

Common Stock: 3,200,000 shares of stock selling at a market price of \$94.25. The stock has a beta of 1.1. The company just paid a dividend of \$0.95 and has a dividend growth rate 4.5 percent.

Market: The market risk premium is 7.2 percent and the risk-free rate is 2.5 percent. The company is in the 40 percent tax bracket.

<i>Debt:</i>	Bond 1	Bond 2
Number of bonds	60,000	45,000
Par value (% of par)	100	100
Coupon rate	5.15%	6.20%
Quoted price	108.25	97.65
Settlement date	1/1/2000	1/1/2000
Maturity date	1/1/2018	1/1/2025
Coupons per year	2	2
Par value (\$)	\$ 1,000	\$ 2,000
<i>Preferred stock</i>		
Number of shares	100,000	
Dividend	4.80%	
Price	\$ 92	
<i>Common stock</i>		
Number of shares	3,200,000	
Price	\$ 94.25	
Beta	1.10	
Current dividend	\$ 0.85	
Dividend growth rate	4.10%	
<i>Market</i>		
Market risk premium	7.2%	
Risk-free rate	2.5%	
Tax rate	40%	

<i>Debt</i>	Bond 1	Bond 2
YTM	4.48%	6.39%
Aftertax cost	2.69%	3.83%

Cost of preferred 5.22%

Cost of equity

CAPM	10.42%
DDM	5.04% Too low

	Market value	Weight
Bond 1	\$ 64,950,000	0.1401
Bond 2	87,885,000	0.1896
Preferred	9,200,000	0.0198
Equity	301,600,000	0.6505
Total	\$ 463,635,000	1.00

WACC 7.98%

YOUR NAME HERE

Problem #2 (13 points)

Bennington Golf has developed a new laser range finder. The company has projected sales of 14,900, 17,600, 19,200, 21,400, and 15,300 units per year over the next five years, respectively. Equipment necessary for production will cost \$3.4 million today and will be depreciated on a three-year MACRS schedule over the life of the project. The equipment can be sold for \$275,000 at the end of the project's life. The price and variable costs per unit in today's dollars are \$118 and \$47, respectively. Fixed costs are \$625,000 per year when expressed in today's dollars. The nominal required return is 9.3 percent. The price per unit, variable cost per unit, and fixed costs are all expected to increase at the inflation rate of 3.2 percent. The company has a tax rate of 38 percent. What is the project's NPV?

	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
Sales	14,900	17,600	19,200	21,400	15,300
Equipment	\$ 3,400,000				
Depreciation	33.33%	44.45%	14.81%	7.41%	
Salvage value	\$ 275,000				
Price	\$ 118				
VC	\$ 47				
FC	\$ 625,000				
Nominal required return	9.3%				
Inflation	3.2%				
Tax rate	38%				

Time 0	
Equipment	\$ (3,400,000)
	<u>\$ (3,400,000)</u>

NOMINAL CASH FLOWS

	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
Price	\$ 121.78	\$ 125.67	\$ 129.69	\$ 133.84	\$ 138.13
VC	\$ 48.50	\$ 50.06	\$ 51.66	\$ 53.31	\$ 55.02
FC	\$ 645,000.00	\$ 665,640.00	\$ 686,940.48	\$ 708,922.58	\$ 731,608.10

	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
Sales	\$ 1,814,462	\$ 2,211,842	\$ 2,490,132	\$ 2,864,274	\$ 2,113,352
VC	722,710	880,988	991,832	1,140,855	841,759
FC	645,000	665,640	686,940	708,923	731,608
Dep	1,133,220	1,511,300	503,540	251,940	-
EBT	<u>\$ (686,467)</u>	<u>\$ (846,086)</u>	<u>\$ 307,819</u>	<u>\$ 762,557</u>	<u>\$ 539,985</u>
Tax	(260,858)	(321,513)	116,971	289,771	205,194
NI	<u>\$ (425,610)</u>	<u>\$ (524,573)</u>	<u>\$ 190,848</u>	<u>\$ 472,785</u>	<u>\$ 334,791</u>
+Dep	1,133,220	1,511,300	503,540	251,940	-
OCF	<u>\$ 707,610</u>	<u>\$ 986,727</u>	<u>\$ 694,388</u>	<u>\$ 724,725</u>	<u>\$ 334,791</u>

Sell equipment	\$ 275,000
Taxes	<u>(104,500)</u>
Aftertax salvage value	\$ 170,500

Year	CF
0	\$ (3,400,000)
1	707,610
2	986,727
3	694,388
4	724,725
5	505,291

NPV (\$563,128.86)

REAL CASH FLOWS

Real required return 5.91%

Time 0

Equipment	\$ (3,400,000)
	\$ (3,400,000)

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Nominal depreciation	\$ 1,133,220.00	\$ 1,511,300.00	\$ 503,540.00	\$ 251,940.00	\$ -
Real depreciation	\$ 1,098,081.40	\$ 1,419,029.05	\$ 458,136.49	\$ 222,115.23	\$ -

	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
Sales	\$ 1,758,200	\$ 2,076,800	\$ 2,265,600	\$ 2,525,200	\$ 1,805,400
VC	700,300	827,200	902,400	1,005,800	719,100
FC	625,000	625,000	625,000	625,000	625,000
Dep	1,098,081	1,419,029	458,136	222,115	-
EBT	\$ (665,181)	\$ (794,429)	\$ 280,064	\$ 672,285	\$ 461,300
Tax	(252,769)	(301,883)	106,424	255,468	175,294
NI	\$ (412,412)	\$ (492,546)	\$ 173,639	\$ 416,817	\$ 286,006
+Dep	1,098,081	1,419,029	458,136	222,115	-
OCF	\$ 685,669	\$ 926,483	\$ 631,776	\$ 638,932	\$ 286,006

Sell equipment	\$ 234,928
Taxes	(89,273)
Aftertax salvage value	\$ 145,655

Year	CF
0	\$ (3,400,000)
1	685,669
2	926,483
3	631,776
4	638,932
5	431,661

NPV (\$563,128.86)

YOUR NAME HERE

Problem #3 (12 points)

RDH, Inc., manufactures high quality ladies boots. The company is considering the launch of a new boot style. Given the company's history, it believes that it can sell 34,000, 27,000, 24,000, and 18,000 pair of boots per year for the next 4 years, respectively. The new boots would have variable costs of \$134 per pair. Fixed production costs are \$4.25 million per year and the equipment necessary for the new line costs \$7.8 million. The equipment will be depreciated on a 5-year MACRS schedule. The line would require an investment in NWC of 15 percent of sales to be stockpiled one year ahead of sales, the tax rate is 40 percent, and the required return is 9 percent. The company expects that because of changes in styles, the new design can only be sold for the next four years. In four years, the equipment can be sold for \$1.8 million, although the company believes it will keep the machinery for another product line. Additionally, the CEO has stated that she requires an NPV of \$250,000 to undertake the new line of boots. What is the price per pair of boots that the company must set in order to

Quantity per year		34,000	27,000	24,000	18,000	
VC per unit	\$	134				
Fixed costs	\$	4,250,000				
Equipment	\$	7,800,000				
Depreciation			20.00%	32.00%	19.20%	11.52%
NWC		15%				
Tax rate		40%				
Required return		9%				
Salvage value	\$	1,800,000				
Required NPV	\$	250,000				

Price \$ 397.92

Book value \$ 6,240,000 \$ 3,744,000 \$ 2,246,400 \$ 1,347,840

	<u>Year 0</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Sales	\$ 13,529,296	\$ 10,743,853	\$ 9,550,092	\$ 7,162,569	
VC	4,556,000	3,618,000	3,216,000	2,412,000	
FC	4,250,000	4,250,000	4,250,000	4,250,000	
Depreciation	1,560,000	2,496,000	1,497,600	898,560	
EBT	\$ 3,163,296	\$ 379,853	\$ 586,492	\$ (397,991)	
Tax	1,265,319	151,941	234,597	(159,197)	
Net income	\$ 1,897,978	\$ 227,912	\$ 351,895	\$ (238,795)	
+Depreciation	1,560,000	2,496,000	1,497,600	898,560	
OCF	\$ 3,457,978	\$ 2,723,912	\$ 1,849,495	\$ 659,765	

Beginning NWC	\$ -	\$ 2,029,394	\$ 1,611,578	\$ 1,432,514	\$ 1,074,385
Ending NWC	2,029,394	1,611,578	1,432,514	1,074,385	-
NWC cash flow	\$ (2,029,394)	\$ 417,817	\$ 179,064	\$ 358,128	\$ 1,074,385

Salvage	
Sell old	\$ 1,800,000
Taxes	(180,864)
Aftertax salvage value	\$ 1,619,136

Capital spending	\$ (7,800,000)				1,619,136
NWC	(2,029,394)	417,817	179,064	358,128	1,074,385
Total cash flow	\$ (9,829,394)	\$ 3,875,794	\$ 2,902,976	\$ 2,207,623	\$ 3,353,287

NPV \$250,000.00

Microsoft Excel 15.0 Answer Report

Worksheet: [FIN 6100 Exam 2 Summer 2017 with answers.xlsx]#3

Report Created: 8/7/2017 8:19:33 PM

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

Solver Engine

Engine: GRG Nonlinear

Solution Time: 0 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\$44	NPV Year 0	(\$5,892,461.68)	\$250,000.00

Variable Cells

Cell	Name	Original Value	Final Value	Integer
\$B\$16	Price	\$ 275.00	\$ 397.92	Contin

Constraints

Cell	Name	Cell Value	Formula	Status	Slack
\$B\$44	NPV Year 0	\$250,000.00	\$B\$44=250000	Binding	0

YOUR NAME HERE

Problem #4 (11 points)

Eclipse, Inc., has a new project under consideration that will require an investment of \$6.9 million today. If the project is successful, the cash flows will be \$2.6 million for 12 years. If the project is unsuccessful, the cash flows will be \$285,000 per year. Additionally, the company could sell the project's fixed assets in one year and realize an aftertax salvage value of \$4.7 million. The required return is 16 percent. What is the minimum probability of success that will make the project acceptable to the company?

Cost today	\$	6,900,000
Cash flows if successful	\$	2,600,000
Years for cash flows		12
Cash flows if not successful	\$	285,000
Salvage value in one year	\$	4,700,000
Required return		16%

Probability of success 28.24%

Value of unsuccessful cash flows in one year \$ 1,433,164

Cash flow in one year if unsuccessful \$ 4,700,000

NPV is successful	\$	6,612,478.78
NPV if not successful		(2,602,586.21)
NPV	\$	<u>(2.00)</u>

Microsoft Excel 15.0 Answer Report

Worksheet: [FIN 6100 Exam 2 Summer 2017 with answers.xlsx]#4

Report Created: 8/4/2017 2:58:31 PM

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

Solver Engine

Engine: GRG Nonlinear

Solution Time: 0.016 Seconds.

Iterations: 1 Subproblems: 0

Solver Options

Max Time Unlimited, Iterations Unlimited, Precision 0.000001, Use Automatic Scaling

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

Max Subproblems Unlimited, Max Integer Sols Unlimited, Integer Tolerance 1%, Assume NonNegative

Objective Cell (Value Of)

Cell	Name	Original Value	Final Value
\$B\$24	NPV	\$ 2,004,946.29	\$ (2.00)

Variable Cells

Cell	Name	Original Value	Final Value	Integer
\$B\$14	Probabililty of success	50.00%	28.24%	Contin

Constraints

Cell	Name	Cell Value	Formula	Status	Slack
\$B\$24	NPV	\$ (2.00)	\$B\$24=0	Binding	0

YOUR NAME HERE

Problem #5 (25 points)

R&D expenses	\$	1,500,000				
Equipment cost today	\$	23,000,000				
MACRS depreciation		3.750%	7.219%	6.677%	6.177%	5.713%
		<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Quantity		125,000	240,000	480,000	480,000	480,000
Equipment cost in 2 years		11,000,000				
Price	\$	95				
VC		37%				
FC	\$	2,450,000				
Inventory		12%				
		<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Lost sales		25,000	30,000	30,000	35,000	35,000
Existing frame:						
Price	\$	110				
VC		30%				
FC	\$	2,100,000				
Growth rate of CF		-7%				
Years for extra CF		15				
Tax rate		38%				
Required return		14%				
Weight of debt		30%				
Weight of equity		70%				
Debt floatation costs		4%				
Equity floatation costs		6%				
Internal equity percentage		100%				

	Capital structure	Floatation costs
Debt	30%	4%
Equity	70%	6%
		1.20%

CF @ Time 0	
Equipment	\$ (23,000,000)
Total	\$ (23,000,000)

w/ floatation costs	\$ (23,279,352)
---------------------	-----------------

	<u>Year 0</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Sales - New book		\$ 11,875,000	\$ 22,800,000	\$ 45,600,000	\$ 45,600,000	\$ 45,600,000
Sales lost		(2,750,000)	(3,300,000)	(3,300,000)	(3,850,000)	(3,850,000)
Net sales		\$ 9,125,000	\$ 19,500,000	\$ 42,300,000	\$ 41,750,000	\$ 41,750,000

VC - New	\$ 4,393,750	\$ 8,436,000	\$ 16,872,000	\$ 16,872,000	\$ 16,872,000
VC - Old	(825,000)	(990,000)	(990,000)	(1,155,000)	(1,155,000)
Total VC	\$ 3,568,750	\$ 7,446,000	\$ 15,882,000	\$ 15,717,000	\$ 15,717,000

Sales	\$ 9,125,000	\$ 19,500,000	\$ 42,300,000	\$ 41,750,000	\$ 41,750,000
VC	\$ 3,568,750	\$ 7,446,000	\$ 15,882,000	\$ 15,717,000	\$ 15,717,000
FC	\$ 2,450,000	\$ 2,450,000	\$ 2,450,000	\$ 2,450,000	\$ 2,450,000
Depreciation	862,500	1,660,370	1,535,710	1,420,710	1,313,990
Depreciation			412,500	794,090	734,470
EBT	\$ 2,243,750	\$ 7,943,630	\$ 22,019,790	\$ 21,368,200	\$ 21,534,540
Tax	852,625	3,018,579	8,367,520	8,119,916	8,183,125
NI	\$ 1,391,125	\$ 4,925,051	\$ 13,652,270	\$ 13,248,284	\$ 13,351,415
+Dep	862,500	1,660,370	1,948,210	2,214,800	2,048,460
OCF	\$ 2,253,625	\$ 6,585,421	\$ 15,600,480	\$ 15,463,084	\$ 15,399,875

NWC new beginning	\$ -	\$ 1,095,000	\$ 2,340,000	\$ 5,076,000	\$ 5,010,000
NWC new ending	1,095,000	2,340,000	5,076,000	5,010,000	5,010,000
NWC CF new	\$ (1,095,000)	\$ (1,245,000)	\$ (2,736,000)	\$ 66,000	\$ -

Capital spending		\$ (11,000,000)			
Floatation costs		(133,603)			
Net capital spending		\$ (11,133,603)			

Total CF	\$ (23,279,352)	\$ 1,158,625	\$ (5,793,183)	\$ 12,864,480	\$ 15,529,084	\$ 15,399,875
----------	-----------------	--------------	----------------	---------------	---------------	---------------

Year	CF
0	\$ (23,279,352)
1	1,158,625.00
2	(5,793,182.64)
3	12,864,479.80
4	15,529,084.00
5	15,399,874.80
6	14,321,883.56
7	13,319,351.71
8	12,386,997.09
9	11,519,907.30
10	10,713,513.79
11	9,963,567.82
12	9,266,118.07
13	8,617,489.81
14	8,014,265.52
15	7,453,266.94
16	6,931,538.25
17	6,446,330.57
18	5,995,087.43
19	5,575,431.31
20	5,185,151.12

NPV
IRR

\$32,904,994.94 Take the project since the NPV is positive.

29.98% You cannot use the IRR since there are multiple IRRs.