Problem set 1

Corporate securities

1. Answer RWJ problems 14.4-14.9

Problem set 2

Capital markets efficiency

1. Answer RWJ problems 13.4, 13.6, 13.7, 13.9, 13.21, 13.22

Problem set 3

Leverage return and WACC

1. Answer RWJ problems 15.1, 15.2, 15.7, 15.9

Problem set 4

Debt and taxes, financial distress

1. Answer RWJ problems 15.16, 15.18, 16.1, 16.4, 16.5, 16.6

2. A firm is considering one of two projects. Both projects require an investment of $900,000 dollars today. Both projects will pay in full next year. The payment of each project next year depends on the state of the world. There are two possible states: expansion with probability of 40%, and recession with probability of 60%. The payout of each project next year is:

Project	Recession	Expansion
A	800,000	1,400,000
B	400,000	1,600,000

Assume that the project is the only asset the firm has, and that the firm is a limited liability corporation. Also assume that investors are risk neutral and that the market interest rate is 0% (these assumption allow you to value assets and liabilities at their expected value.).

(a) Which project should a single owner of the firm choose?

(b) Assume that part of the investment is financed with debt with face value of $700,000 that matures next year. Which project will the firm's stockholders choose if the firm borrows first and then decides on the project?

(c) What is the value of the debt if the firm chose project A?, or project B?

(d) What is the expected return to the equity holders if they commit to project A. What is their return if they cannot commit. Is committing to project A the interest of the equity holders.

4. CoolDay Corp. is a wholesale company that sells Air conditions. It has 10,000 air conditions which it intends to sell this summer. In case of a hot summer the average price of a unit sold will be $500, but in a case of a cold summer the average price will be only $300. The probability of a hot summer is 40% and the probability of a cold summer is 60%. The company has debt that matures at the end of the summer with face value of $3,800,000. Assume that investors are risk neutral and that the market interest rate is 0.

(a) What is the value of the firm's assets, what is the value of its debt and of its equity.

The firm was offered to buy 10,000 fashionable bathing suits for $30 per unit. The firm will be able to sell these bathing suits this summer for $60 per unit regardless of how hot the summer is.

(b) What is the value of the firms assets it debt and its equity it is able to raise the money needed to purchase the bathing suits.

(c) Would the equity holders invest the money needed to make this investment?

Problem set 5

Dividend policy

1. Answer RWJ problems 18.1, 18.2, 18.15

2. The SRC company has real estate assets valued at $140 million and cash of $40 million. It also has 18 million shares outstanding. The company decides to use $30 million of its cash to repurchase part of its stock in a tender offer for $12 per-share
   a) What is the stock price prior to the repurchase? How many shares can SRC purchase?
   b) What would be the price of the remaining shares after the repurchase if stockholders continue to value SRC real estate assets at $140 million?
   c) What would be the price of the remaining shares after the repurchase if stockholders believe that the repurchase signals that the value of SRC real estate assets 150 million?

Problem set 6

Public offerings

1. Answer RWJ problems 19.1, 19.6, 19.7, 19.11

Problem set 7

Stock, and firm valuation

1. The HDY Co. paid yesterday a dividend of $2 per share from an annual earnings per share (EPS) of $5. In the past 5 years HDY showed earnings growth of 8% per year. You expect HDY to remain at this level of growth for 6 more years after which the growth rate of EPS per share will be 4% per year forever. You expect the payout ratio of HDY to remain at the current level in the next five year and to increase to 60% starting in year 6 and remain at this level forever. HDY has a stock beta of 1.2. Also assume that the risk free rate is 6% and the market's expected risk premium over the risk free rate is 8.5%.What should be the price of HDY stock?

2. The **net** operating cashflow of Bay oil company in the past year was $1,000,000. Cash flow is expected to grow at 15% per year for 11 years and after that it will grow at 5% in perpetuity. The company's target debt to capital ratio is 0.5. The equity beta of Bay oil company is 1.1 and beta of the debt is 0.2. The risk free rate is 6% and the market's expected risk premium over the risk free rate is 8.5%. The corporate tax rate is 35%.

   a) What is Bay Oil's cost of equity, cost of debt and WACC?
   b) What is the value of Bay Oil's assets? What is the value of its debt and equity?

3. NewCorp is about to go public. Your are trying to value its equity using the industry EBITD median multiple. You find three publicly traded companies in a similar line of business. Based on the following information, what is your estimate on NewCorp equity value?

Company	**Corp1**	**Corp2**	**Corp3**	**NewCorp**
Total debt	2,000	2,400	0	1000
Market value of equity	8,000	15,000	15,000	??
Total book assets	5,000	12,000	12,000	10,000
EBITD	1,000	1,800	1,800	1,200

Problem set 8

Mergers and Acquisitions

1. Answer RWJ problems 29.4, 29.5, 29.6, 29.10, 29.12

Problem set 9

Warrants and Convertible debt

1. Answer RWJ problems 24.3, 24.12, 24.14, 24.15

Solutions Problem set 4

2. (a). If a single owner (in hundred thousands dollars):

Project	Recession	Expansion	E(value)	E(return)
A	8	14	8×0.6+14×0.4=10.4	10.4/9-1=0.156
B	4	16	4×0.6+16×0.4=8.8	8.8/9-1=-0.022

Project A has a Higher expected value and therefore a higher expected return and should be chosen.

(b) If face value of debt is 7 the equity value is:

Project	Recession	Expansion	E(value)
A	1	7	1*.6+7*.4=3.4
B	0	9	0*.6+9*.4=3.6

In this case the expected value of the equity is higher if project B is taken that is what the equity holders will choose if the borrow first and then decide

(c) Value of the debt in each project

Project	Recession	Expansion	E(value)
A	7	7	7*.6+7*.4=7
B	4	7	4*.6+7*.4=5.2

(d) The expected return to the equity holders:

Project	E(value) equity	E(return Equity)
A	3.4	3.4/(9-7)-1=70%
B	3.6	3.6/(9-5.2)-1=-5.3%

If the equity holders can commit to project A they would get $700,000 from the debt holders (see part c) and thus they will need to invest only $200,000, in return their expected value is $340,000 or an expected return of 70%. If they cannot commit the debtholders know that the equityholders will take project B and therefore give only $520,000. Thus equity holders must invest $380,000 to get only 360,000 for an expected return of -5.3%. Therefore, it is in the interest of the debtholders to commit to project A through a debt covenant.

2. (a) The value of the inventory of air conditions depends on the weather in the upcoming summer. If the weather is hot the inventory will be sold for 10,000*500=$5,000,000, if the weather is cold the sale value is only 10,000*300=$3,000,000. The value of the firm's assets (inventory), debt, and equity in millions:

Asset/security	Cold summer	Hot summer	Expected value
Air conditions	3	5	3*.6+5*.4=3.8
Debt (face value=3.8)	3	3.8	3*0.6+3.8*0.4=3.32
Equity	0	1.2	0*0.6+1.2*0.4=0.48
Debt + Equity	3	5	3.8

(b) If the firm invests in the bathing suits it needs an investment of 30*10,000 or $300,000 in order to buy. The proceeds from the sale will be 60*10,000 or $600,000. The proceeds will be part of the firm's assets at the end of the summer.

Asset/security	Cold summer	Hot summer	Expected value
Air conditions	3	5	3*.6+5*.4=3.8
Proceeds from bathing suits	0.6	0.6	0.6
Total assets	3.6	5.6	3.6*.6+5.6*.4=4.4
Debt (face value=3.8)	3.6	3.8	3.6*.6+3.8*.4=3.68
Equity	0	1.8	0*0.6+1.8*0.4=0.72
Debt + Equity	3.6	5.6	4.4

(c) If the investment is taken the expected value of the equity will increase from $480,000 to $720,000, or by $240,000. Therefore the equity holders will not contribute the $300,000 needed to finance the purchase of the bathing suits and a good investment opportunity may be passed by.

Solutions Problem set 5

2. a. $P_0 = \frac{140 + 40}{18} = 10$

It can repurchase $m = \frac{30mil}{12} = 2.5mil$ shares

b. $P_1 = \frac{140 + 10}{18 - 2.5} = 9.677$

c. $P_1 = \frac{150 + 10}{18 - 2.5} = 10.323$

Solutions Problem set 7

2. Cost of equity=0.06+1.2×0.085=0.162

$Div_1 = 2 \times 1.08 = 2.16$

PVGS=growing annuity(pmt=2.16, r=0.162, g=0.08,n=5)

$$\frac{2.16}{0.162 - 0.08} - \frac{2.16}{0.162 - 0.08} \times \frac{1.08^5}{1.162^5} = 8.072$$

$EPS_6 = 5 \times 1.08^6 = 7.934$

$Div_6 = 7.934 \times 0.6 = 4.761$

PVSS=$\frac{4.761}{0.162 - 0.04} \times \frac{1}{1.162^5} = 18.419$

Stock price=21.477+8.072=<u>$26.491</u>

3. a). Cost of equity=0.06+1.1×0.085=0.1535
Cost of debt=0.06+0.2×0.085=0.077
WACC=0.5×0.077×(1-0.35)+0.5×0.1535=0.101775

b)

$CF_1 = 10{,}000 \times 1.15 = 11{,}500$

PVGS(years 1 through 10)=growing annuity(pmt=11,500, r=0.101775, g=0.15,n=10)

$$\frac{11{,}500}{0.101775 - 0.15} - \frac{11{,}500}{0.101775 - 0.15} \times \frac{1.15^{10}}{1.101775^{10}} = 127{,}529$$

$CF_{11} = 10{,}000 \times 1.15^{11} = 46{,}524$

PVSS=$\frac{46{,}524}{0.101775 - 0.05} \times \frac{1}{1.101775^{10}} = 340{,}900$

Firm value=127,529+340,900=<u>$468,429</u>

Value of equity=234,214.5

Value of debt=234,214.5

Notice: I include year 11 as the first year of the second stage. You can include it as the last year of the first stage. If you do that then $CF_{12} = 10{,}000 \times 1.15^{11} \times 1.05 = 48{,}850$

4.

Company	Corp1	Corp2	Corp3	NewCorp
Total capital	10,000	17,400	15,000	
Capital/EBITD	10	9.667	8.333	

Median Capital/EBITD=9.667

Value of NewCorp capital=9.667*1200=11,600

Value of NewCorp equity=11,600-1000=$10,600