



SPROTT
SCHOOL OF BUSINESS

BUSI 2505e - Business Finance

Monday, March 1, 2010

§ 2,7B,10,11,14,15 midterm review

- **assignment 1** - extension until wed march 3 11:30 at beginning of section D class in TB340, can also be dropped off 2126DT 13:00-14:00
- **MIDTERM** - saturday march 6, minto case room (mc2000), 10:00-12:00
- **quiz 3** - rescheduled to march 15
- **quiz 4** - rescheduled to march 29

dividend growth model

$$P_0 = \frac{D_0(1 + g)}{r - g}$$

security market line

$$R_i = R_f + \beta_i(R_M - R_f)$$

beta

$$\beta_a = \frac{\text{cov}(a, m)}{\text{var}(m)}$$

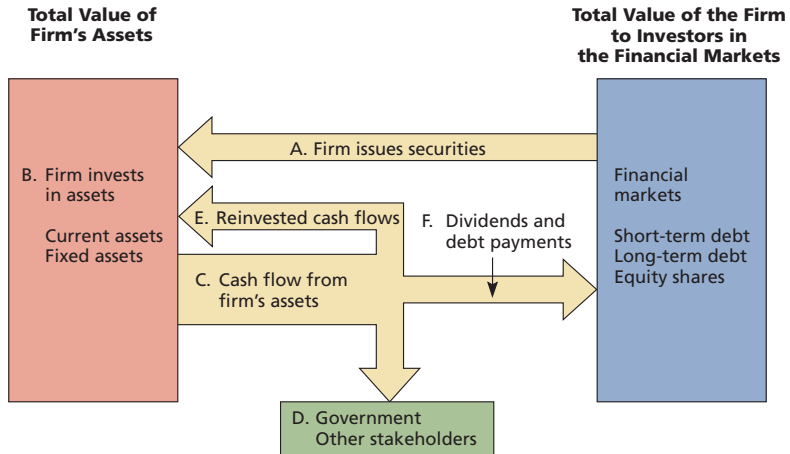
present value of cca tax shield

$PV(\text{Tax Shield CCA}) =$

$$\frac{I \cdot d \cdot T_c}{d + k} \times \frac{1 + .5k}{1 + k} - \frac{S_n \cdot d \cdot T_c}{d + k} \times \frac{1}{(1 + k)^n}$$

formulas not provided on midterm but that you need to know and understand are highlighted in red boxes in the following slides

chapter 2: corporation and financial markets (figure 1.4, p.18)



- A. Firm issues securities to raise cash.
- B. Firm invests in assets.
- C. Firm's operations generate cash flow.

- D. Cash is paid to government as taxes. Other stakeholders may receive cash.
- E. Reinvested cash flows are plowed back into firm.
- F. Cash is paid out to investors in the form of interest and dividends.

- **Operating Cash Flow (OCF)** results from day-to-day activities of producing and selling, expenses from financing assets are not included since they are not operating expenses.
- **Net Capital Spending (NCS)** is money spent on fixed assets less money received from the sale of fixed assets (ie. salvage).
- **changes in Net Working Capital (NWC)** show how current assets and liabilities differ from year-to-year, eg. more accounts receivable and inventory needed to support higher sales.

- **cash flow to creditors** is interest paid on debt less “net new borrowing” (“principal paid back” - “new borrowing”)
- **cash flow to shareholders** is dividends paid less “net new equity” (“shares repurchased” - “*new* shares issued”)

summary

$$\begin{aligned} \text{CFFA} &= \text{CFC} + \text{CFS} \\ &= \text{OCF} - \text{NCS} - (\text{change in NWC}) \end{aligned}$$

$$\text{OCF} = \text{EBIT} + \text{depreciation} - \text{taxes}$$

CFFA = cash flow from assets

CFC = cash flow to creditors

CFS = cash flow to shareholders

OCF = operating cash flow

NCS = net capital spending

NWC = net working capital

EBIT = earnings before interest and taxes

chapter 2: cash flow identity (cont.)

similar to balance sheet identity (assets = liabilities + equity)

The first equation is how the cash flow from the firm is divided among the investors that financed the assets:

$$\left(\begin{array}{c} \text{cash flow} \\ \text{from assets} \end{array} \right) = \underbrace{\left(\begin{array}{c} \text{cash flow to} \\ \text{creditors} \end{array} \right)}_{\substack{\text{interest paid} \\ + \text{ principal paid} \\ - \text{ new borrowing}}} + \underbrace{\left(\begin{array}{c} \text{cash flow to} \\ \text{stockholders} \end{array} \right)}_{\substack{\text{dividends paid} \\ + \text{ stock repurchased} \\ - \text{ new stock issued}}$$

CFFA = cash flow from assets

The second equation is the cash flow that the firm receives from its assets:

$$\left(\begin{array}{c} \text{cash flow} \\ \text{from assets} \end{array} \right) = \underbrace{\left(\begin{array}{c} \text{operating} \\ \text{cash flow} \end{array} \right)}_{\substack{\text{EBIT} \\ + \text{depreciation} \\ - \text{taxes}}} - \underbrace{\left(\begin{array}{c} \text{net capital} \\ \text{spending} \end{array} \right)}_{\substack{\text{ending fixed assets} \\ - \text{beginning fixed assets} \\ + \text{depreciation}}} - \underbrace{\left(\begin{array}{c} \text{additions} \\ \text{to NWC} \end{array} \right)}_{\substack{\text{ending NWC} \\ - \text{beginning NWC}}}$$

EBIT = earnings before interest and taxes

NWC = net working capital

chapter 2: cash flow identity - example

	2005	2006
Sales	\$740	\$785
COGS	430	460
Interest	33	35
Dividends	16	17
Depreciation	250	210
Cash	70	75
Accounts receivables	563	502
Current liabilities	390	405
Inventory	662	640
Long-term debt	340	410
Net fixed assets	1,680	1,413
Common stock	700	235
Tax rate	35%	35%

- 1 What is the net working capital for 2006?
- 2 What is the change in net working capital from 2005 to 2006?
- 3 What is net capital spending for 2006?
- 4 What is the operating cash flow for 2006?
- 5 What is the cash flow from assets for 2006?
- 6 What is net new borrowing for 2006?
- 7 What is the cash flow to creditors for 2006?
- 8 What is the cash flow to stockholders for 2006?

answers: 812, -93, -57, 297,
447, 70, -35, 482

- CCA is depreciation for tax purposes
- CCA is deducted before taxes and acts as a tax shield
- Every capital asset is assigned to a specific asset class by the government
- Every asset class is given a depreciation method and rate
- **Half-year Rule** - In the first year, only half of the asset's cost can be used for CCA purposes

\$100M of 20 year bonds issued 3 years ago (17 left) @ 12%. Call premium at 105 (5%).

Flotation costs were \$2M. Assume \$100M of new bonds (17 year for this example) can be issued at 8%, with flotations of \$2.8M. Call the old bonds in 2 months prior to new issue, and invest proceeds in T-bill at 3.75%. Taxes are 45%. Should you refund?

answer: YES, because $NPV=18,866,129$

- cash flows included in a capital budgeting analysis are those that will only occur (or not occur) if the project is accepted
- these cash flows are called **incremental cash flows**
- **stand-alone principle** allows us to analyze each project in isolation from the firm simply, by focusing on incremental cash flows

The Monumental Co. is considering purchasing a piece of equipment costing \$642,000. The equipment belongs in a 30% CCA class. What is the anticipated tax shield in year three on this equipment if the company is in the 34% marginal tax bracket?

answer: \$38,963

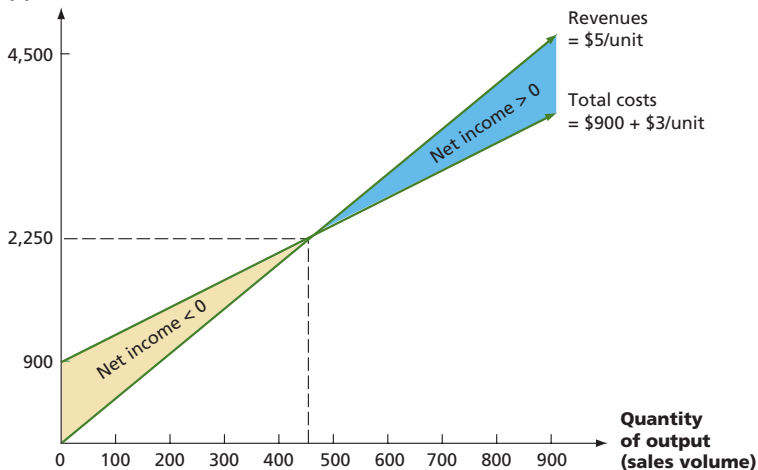
Titanic Tools uses tool and die machines to produce machinery for other firms. The initial cost of one customized tool and die machine is \$1.8 million. This machine costs \$16,000 a year to operate. Each machine has a life of 3 years before it is replaced. What is the equivalent annual cost of this machine if the required return is 14%? Ignore taxes.

answer: \$791,317

- **Accounting break-even** - sales volume where net income = 0
- **Cash break-even** - sales volume where operating cash flow = 0
- **Financial break-even** - sales volume where net present value = 0

“where revenues equal total costs (fixed+variable)”

Sales and costs
(\$)



A project requires an initial equipment purchase of \$480,000, which will be depreciated straight-line to zero over the life of the project. The equipment will have no salvage value. Annual fixed costs are projected at \$266,800. The selling price per unit is \$9.90 with a variable cost per unit of \$6.65. The project has a 6-year life and a required rate of return of 12%. What is the accounting break-even quantity if taxes are ignored?

answer: 106,708

Sam is offering a new product which has a variable cost per unit of \$26.08 and total fixed costs of \$42,714. What is the selling price of this product if the cash break-even quantity is 6,300 units?

answer: \$32.86

- Degree of operating leverage (DOL) measures the relationship between sales and OCF
- DOL is the percentage change in EBIT resulting from a 1% change in sales

DOL: degree of operating leverage, FC: fixed costs, OCF: operating cash flow

$$DOL = 1 + \frac{FC}{OCF}$$

$$\Delta\%(OCF) = DOL \times \Delta\%(QTY)$$

The fixed costs of a project are \$16,000. The depreciation expense is \$7,800 and the operating cash flow is \$12,700. What is the degree of operating leverage for this project?

answer: 2.26

Amy is in charge of a project that has a degree of operating leverage of 3.2. What will happen to the operating cash flows if Amy increases the number of units sold by 2%?

answer: increase by 6.4%

- Start with the dividend growth model formula and rearrange to solve for R_E

P_0 : price of stock today, D_1 : dividend next year,
 D_0 : dividend this year, g : dividend growth rate,
 R_E : cost of equity

$$P_0 = \frac{D_1}{R_E - g} = \frac{D_0(1 + g)}{R_E - g}$$

$$\Rightarrow R_E = \underbrace{\frac{D_1}{P_0}}_{\text{dividend yield}} + \underbrace{g}_{\text{capital gains yield}}$$

One method for estimating the growth rate is to use the historical average.

answer:

Year	Dividend	Percent Change
1995	1.23	
1996	1.30	$(1.30 - 1.23) / 1.23 = 5.7\%$
1997	1.36	$(1.36 - 1.30) / 1.30 = 4.6\%$
1998	1.43	$(1.43 - 1.36) / 1.36 = 5.1\%$
1999	1.50	$(1.50 - 1.43) / 1.43 = 4.9\%$

$$\text{Average} = (5.7 + 4.6 + 5.1 + 4.9) / 4 = 5.1\%$$

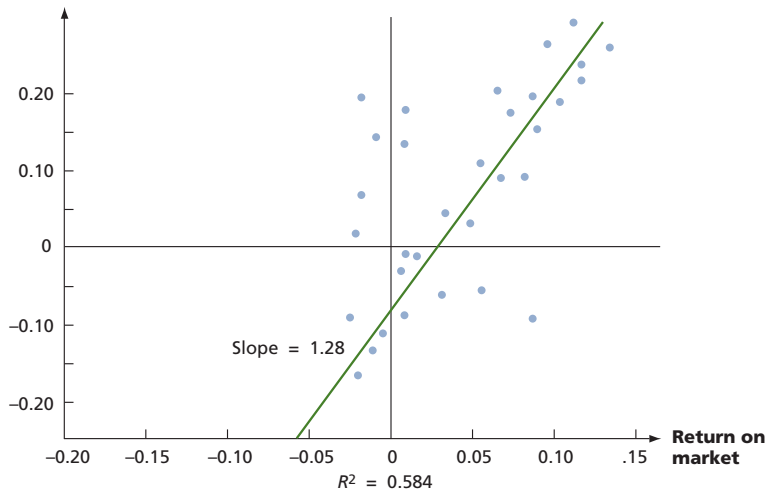
- Use the following information to compute our cost of equity
 - Risk-free rate, R_f
 - Market risk premium, $E(R_M) - R_f$
 - Systematic risk of asset, β

cost of equity - sml approach

$$R_E = R_f + \beta_E (E(R_M) - R_f)$$

- How do we measure systematic risk?
 - We use the beta coefficient (β) to measure systematic risk
- What does beta tell us?
 - $\beta = 1$ - the asset has the same systematic risk as the overall market
 - $\beta < 1$ - the asset has less systematic risk than the overall market
 - $\beta > 1$ - the asset has more systematic risk than the overall market

Return on company



Suppose our company has a beta of 1.5. The market risk premium is expected to be 9% and the current risk-free rate is 6%. We have used analysts estimates to determine that the market believes our dividends will grow at 6% per year and our last dividend was \$2. Our stock is currently selling for \$15.65. What is our cost of equity?

answer:

Using SML:

$$R_E = 6\% + (1.5)(9\%) = 19.5\%$$

Using DGM:

$$R_E = \frac{D_0(1 + g)}{P_0} + g = \frac{2(1.06)}{15.65} + .06 = 19.55\%$$

● Notation

- E = market value of equity = # outstanding shares times price per share
- D = market value of debt = # outstanding bonds times bond price
- P = market value of preferred = # outstanding preferred shares times price per preferred share
- V = market value of the firm = $E + D + P$

● Weights

- $w_E = E/V$ = percent financed with equity
- $w_D = D/V$ = percent financed with debt
- $w_P = P/V$ = percent financed with preferred stock

$$w_E = \frac{1}{1 + \frac{D}{E}}$$

A firm has a debt-equity ratio of .25.
What weight should be given to the
equity for the WACC computation?

answer: 80%

Top-Down, Inc. finances its operations using \$1.50 of debt for every \$2 of common stock. The pre-tax cost of debt is 7.5%, the cost of equity is 11%, and the tax rate is 34%. Currently, the firm is considering a small project that it considers to be equally as risky as the overall firm. The project has an initial cash outlay of \$18,500 and is expected to have a single cash inflow of \$25,000 at the end of year two. What is the net present value of this project?

answer: \$2,773

Rudolph's Transportation has an overall cost of equity of 14.8% and a beta of 1.4. The firm is financed solely with common stock. The risk-free rate of return is 3.5%. What is an appropriate cost of capital for a project within the firm that has an estimated beta of 1.3?

answer: 13.99%

Discount Retailers has an overall beta of .96 and a cost of equity of 10.4% for the firm overall. The firm is financed solely by common stock. Division A within the firm has an estimated beta of 1.13 and is the riskiest of all of the firm's divisions. What is an appropriate cost of capital for division A if the market risk premium is 5%?

answer: 11.25%

Green Yards has a capital structure of 50% common stock, 15% preferred stock, and 35% debt. The flotation costs are 3% for debt, 6% for preferred stock, and 8% for common stock. What is the weighted average flotation cost?

answer: 5.95%

You are considering a project which requires \$136,000 in external financing. The flotation cost of equity is 11% and the cost of debt is 4.5%. You wish to maintain a debt-equity ratio of .45. What is the initial cost of the project including the flotation costs?

answer: \$149,422

- Issue of common stock offered to existing shareholders
- Allows current shareholders to avoid the dilution that can occur with a new stock issue
- “Rights” are given to the shareholders
 - Specify number of shares that can be purchased
 - Specify purchase price
 - Specify time frame
- Rights usually trade on the same exchange as the company’s stock

TOYSrYOU plans to raise \$8 million in a rights offering. If management sets the subscription price at \$2 per share and the current market price is \$2.50 per share, how many shares need to be sold in the rights offering?

answer: 4,000,000 shares

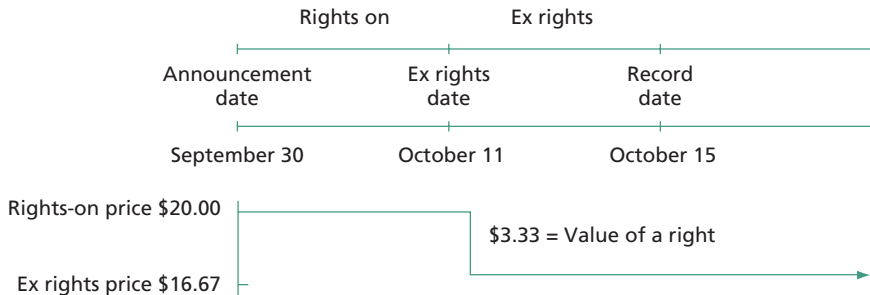
TOYSrYOU needs to raise \$5 million in a rights offering. If the subscription price is \$10 per share, the stock price is \$12.50 per share, and there are 4 million shares outstanding, how many rights are required to purchase one of the new shares?

answer: 8.0 rights

TOYSrYOU needs to raise \$5 million in a rights offering. If the subscription price is \$10 per share, the stock price is \$12.50 per share, and there are 4 million shares outstanding, what is the value of a right?

answer: \$0.28

chapter 15: ex-rights stock prices (figure 15.3, p.469)



In a rights offering, there is a date of record, which is the last day that a shareholder can establish legal ownership. However, stocks are sold ex rights two business days before the record date. Before the ex rights day, the stock sells rights on, which means the purchaser receives the rights.

Tell-AI, Inc. has 8 million shares of common stock outstanding at a market price of \$22. The company has just announced a rights offering for \$27 million at a subscription price of \$18. What is the ex-rights price?

answer: \$21.37

Classique Inc., a manufacturer of reproduction parts for classic automobiles, needs to raise \$2 million via a rights offering. The subscription price is \$2 per share. The firm currently has 2 million shares outstanding, and the current market price per share is \$6.

- 1 How many new shares will be issued?
- 2 How many rights are required to purchase one share?
- 3 What is the value of a right?
- 4 What is the ex-rights price of the firm's stock?
- 5 What will the firm be worth following the rights offering?

answer: 1,000,000 shares; 2 rights; \$1.33; \$4.67; \$14.00 million

Stephen owns 5,000 shares of ABNC stock. Currently, there are 1.2 million shares outstanding. The company has just announced a rights offering whereby 300,000 shares are being offered for sale at a subscription price of \$24 a share. The current stock price is \$27 a share. Assume that Stephen sells his rights and that all rights are exercised. What will his ownership percentage be in ABNC after the rights are exercised?

answer: .33%