Lecture 9 & 10
Cost of Capital and issuance

FINA 614

Key Concepts and Skills

- Know how to determine a firm's cost of equity capital

- Know how to determine a firm's cost of debt

- Know how to determine a firm's overall cost of capital

- Understand pitfalls of overall cost of capital and how to manage them

Importance of Cost of Capital

- We know that the return earned on assets depends on the risk of those assets

- The return to an investor is the same as the cost to the company

- Our cost of capital provides us with an indication of how the market views the risk of our assets

- Knowing our cost of capital can also help us determine our required return for capital budgeting projects

Required Return

- The required return is the same as the appropriate discount rate and is based on the risk of the cash flows

- We need to know the required return for an investment before we can compute the NPV and make a decision about whether or not to take the investment

- We need to earn at least the required return to compensate our investors for the financing they have provided

Cost of Equity

- The cost of equity is the return required by equity investors given the risk of the cash flows from the firm

- There are two major methods for determining the cost of equity
  - Dividend growth model
  - SML or CAPM

The Dividend Growth Model Approach

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

$$P_0 = \frac{D_1}{R_E - g}$$

$$R_E = \frac{D_1}{P_0} + g$$

Dividend Growth Model

- Suppose that your company is expected to pay a dividend of $1.50 per share next year. There has been a steady growth in dividends of 5.1% per year and the market expects that to continue. The current price is $25. What is the cost of equity?

$$R_E = \frac{1.50}{25} + .051 = .111$$

Example: Estimating the Dividend Growth Rate

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

  - Year   Dividend Percent Change
  - 1995   1.23
  - 1996   1.30
  - 1997   1.36
  - 1998   1.43
  - 1999   1.50

$(1.30 - 1.23) / 1.23 = 5.7\%$

$(1.36 - 1.30) / 1.30 = 4.6\%$

$(1.43 - 1.36) / 1.36 = 5.1\%$

$(1.50 - 1.43) / 1.43 = 4.9\%$

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

Alternative Approach to Estimating Growth

- If the company has a stable ROE, a stable dividend policy and is not planning on raising new external capital, then the following relationship can be used:
  - g = Retention ratio x ROE
- XYZ Co is has a ROE of 15% and their payout ratio is 35%. If management is not planning on raising additional external capital, what is XYZ's growth rate?
  - g = (1-0.35) x 0.15 = 9.75%

Advantages and Disadvantages of Dividend Growth Model

- Advantage – easy to understand and use
- Disadvantages
  - Only applicable to companies currently paying dividends
  - Not applicable if dividends aren't growing at a reasonably constant rate
  - Extremely sensitive to the estimated growth rate – an increase in g of 1% increases the cost of equity by 1%
  - Does not explicitly consider risk (WHY??)

Concept Question

- Present an alternative methods for estimating growth rate.

The SML Approach

- 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

$$E(r) = r_f + \beta(E(r_m) - r_f)$$

Example 1 revisited – SML

- Suppose your company has an equity beta of .58 and the current risk-free rate is 6.1%. If the expected market risk premium is 8.6%, what is your cost of equity capital?

  - R_E = 6.1 + .58(8.6) = 11.1%

- Since we came up with similar numbers using both the dividend growth model and the SML approach, we should feel pretty good about our estimate

Advantages and Disadvantages of SML

- Advantages
  - Explicitly adjusts for systematic risk
  - Applicable to all companies, as long as we can compute beta
- Disadvantages
  - Have to estimate the *expected* market risk premium, which does vary over time
  - Have to estimate beta, which also varies over time
  - We are relying on the past to predict the future, which is not always reliable

Example – Cost of Equity

- 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?

  - Using SML: R_E = 6% + 1.5(9%) = 19.5%

  - Using DGM: R_E = [2(1.06) / 15.65] + .06 = 19.55%

Cost of Debt

- The cost of debt is the required return on our company's debt
- We usually focus on the cost of long-term debt or bonds
- The required return is best estimated by computing the yield-to-maturity on the existing debt
- We may also use estimates of current rates based on the bond rating we expect when we issue new debt
- The cost of debt is NOT the coupon rate

Example: Cost of Debt

- Suppose we have a bond issue currently outstanding that has 25 years left to maturity. The coupon rate is 9% and coupons are paid semiannually. The bond is currently selling for $908.72 per $1000 bond. What is the cost of debt?
  - N = 50; PMT = 45; FV = 1000; PV = -908.75; CPT I/Y = 5%; YTM = 5(2) = 10%

Cost of Preferred Stock

- Reminders
  - Preferred generally pays a constant dividend every period
  - Dividends are expected to be paid every period forever
- Preferred stock is an annuity, so we take the annuity formula, rearrange and solve for R_P
- $R_P = D / P_0$

Example: Cost of Preferred Stock

- Your company has preferred stock that has an annual dividend of $3. If the current price is $25, what is the cost of preferred stock?

- R_P = 3 / 25 = 12%

The Weighted Average Cost of Capital

- We can use the individual costs of capital that we have computed to get our "average" cost of capital for the firm.

- This "average" is the required return on our assets, based on the market's perception of the risk of those assets

- The weights are determined by how much of each type of financing that we use

Capital Structure Weights

- Notation
  - E = market value of equity = # outstanding shares times price per share
  - D = market value of debt = # outstanding bonds times bond price
  - V = market value of the firm = D + E
- Weights
  - w_E = E/V = percent financed with equity
  - w_D = D/V = percent financed with debt

Example: Capital Structure Weights

- Suppose you have a market value of equity equal to $500 million and a market value of debt = $475 million.
  - What are the capital structure weights?
    - V = 500 million + 475 million = 975 million
    - w_E = E/D = 500 / 975 = .5128 = 51.28%
    - w_D = D/V = 475 / 975 = .4872 = 48.72%

Taxes and the WACC

- We are concerned with after-tax cash flows, so we need to consider the effect of taxes on the various costs of capital

- Interest expense reduces our tax liability
  - This reduction in taxes reduces our cost of debt
  - After-tax cost of debt = $R_D(1-T_C)$

- Dividends are not tax deductible, so there is no tax impact on the cost of equity

- $WACC = w_E R_E + w_D R_D(1-T_C)$

Example 1 – WACC

- Equity Information
  - 50 million shares
  - $80 per share
  - Beta = 1.15
  - Market risk premium = 9%
  - Risk-free rate = 5%

- Debt Information
  - $1 billion in outstanding debt (face value)
  - Current quote = 110
  - Coupon rate = 9%, semiannual coupons
  - 15 years to maturity
- Tax rate = 40%

Example 1 – WACC continued

- What is the cost of equity?
  - $R_E = 5 + 1.15(9) = 15.35\%$
- What is the cost of debt?
  - N = 30; PV = -1100; PMT = 45; FV = 1000; CPT I/Y = 3.9268
  - $R_D = 3.927(2) = 7.854\%$
- What is the after-tax cost of debt?
  - $R_D(1-T_C) = 7.854(1-.4) = 4.712\%$

Example 1 – WACC continued

- What are the capital structure weights?
  - E = 50 million (80) = 4 billion
  - D = 1 billion (1.10) = 1.1 billion
  - V = 4 + 1.1 = 5.1 billion
  - w_E = E/V = 4 / 5.1 = .7843
  - w_D = D/V = 1.1 / 5.1 = .2157
- What is the WACC?
  - WACC = .7843(15.35%) + .2157(4.712%) = 13.06%

Table 14.1 Cost of Equity

I. The cost of equity, R_E

   A. Dividend growth model approach (from Chapter 8):

$$R_E = D_1/P_0 + g$$

   where D_1 is the expected dividend in one period, g is the dividend growth rate, and P_0 is the current stock price.

   B. SML approach (from Chapter 13):

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

   where R_f is the risk-free rate, R_M is the expected return on the overall market, and β_E is the systematic risk of the equity.

Table 14.1 Cost of Debt

II. **The cost of debt, R_D**

A. For a firm with publicly held debt, the cost of debt can be measured as the yield to maturity on the outstanding debt. The coupon rate is irrelevant. Yield to maturity is covered in Chapter 7.

B. If the firm has no publicly traded debt, then the cost of debt can be measured as the yield to maturity on similarly rated bonds (bond ratings are discussed in Chapter 7).

Table 14.1 WACC

III. **The weighted average cost of capital, WACC**

    A. The firm's WACC is the overall required return on the firm as a whole. It is the appropriate discount rate to use for cash flows similar in risk to those of the overall firm.

    B. The WACC is calculated as:

$$WACC = (E/V) \times R_E + (D/V) \times R_D \times (1 - T_C)$$

where T_C is the corporate tax rate, E is the *market* value of the firm's equity, D is the *market* value of the firm's debt, and $V = E + D$. Note that E/V is the percentage of the firm's financing (in market value terms) that is equity, and D/V is the percentage that is debt.

Divisional and Project Costs of Capital 14.5

- Using the WACC as our discount rate is only appropriate for projects that have the same risk as the firm's current operations

- If we are looking at a project that is NOT the same risk as the firm, then we need to determine the appropriate discount rate for that project

- Divisions also often require separate discount rates because they have different levels of risk

Using WACC for All Projects - Example

- What would happen if we use the WACC for all projects regardless of risk?

- Assume the WACC = 15%

Project	Required Return	IRR
A	20%	17%
B	15%	18%
C	10%	12%

The Pure Play Approach

- Find one or more companies that specialize in the product or service that we are considering

- Compute the beta for each company

- Take an average

- Use that beta along with the CAPM to find the appropriate return for a project of that risk

- Often difficult to find pure play companies

Subjective Approach

- Consider the project's risk relative to the firm overall
- If the project is more risky than the firm, use a discount rate greater than the WACC
- If the project is less risky than the firm, use a discount rate less than the WACC
- You may still accept projects that you shouldn't and reject projects you should accept, but your error rate should be lower than not considering differential risk at all

Subjective Approach - Example

Risk Level	Discount Rate
Very Low Risk	WACC – 8%
Low Risk	WACC – 3%
Same Risk as Firm	WACC
High Risk	WACC + 5%
Very High Risk	WACC + 10%

Flotation Costs

- The required return depends on the risk, not how the money is raised

- However, the cost of issuing new securities should not just be ignored either

- Basic Approach
  - Compute the weighted average flotation cost
  - Use the target weights because the firm will issue securities in these percentages over the long term

NPV and Flotation Costs - Example

- Your company is considering a project that will cost $1 million. The project will generate after-tax cash flows of $250,000 per year for 7 years. The WACC is 15% and the firm's target D/E ratio is .6 The flotation cost for equity is 5% and the flotation cost for debt is 3%. What is the NPV for the project after adjusting for flotation costs?

NPV and Flotation Costs – Example continued

- D/E = 0.6 – therefore, D/V = 6/16 = 0.375 and E/V = 10/16 = 0.625
- f_A = (.375)(3%) + (.625)(5%) = 4.25%
- True cost is $1 million / (1-0.0425) = $1,044,386
- PV of future cash flows = 1,040,105
- NPV = 1,040,105 – 1,044,386 = -4,281

- The project would have a positive NPV of 40,105 without considering flotation costs

- Once we consider the cost of issuing new securities, the NPV becomes negative

Venture Capital

- Private financing for relatively new businesses in exchange for stock
- Usually entails some hands-on guidance
- The ultimate goal is usually to take the company public and the VC will benefit from the capital raised in the IPO
- Many VC firms are formed from a group of investors that pool capital and then have partners in the firm decide which companies will receive financing
- Some large corporations have a VC division

Choosing a Venture Capitalist

- Look for financial strength
- Choose a VC that has a management style that is compatible with your own
- Obtain and check references
- What contacts does the VC have?
- What is the exit strategy?

The Public Issue

- Public issue – the creation and sale of securities that are intended to be traded on the public markets

- All companies on the TSE come under the Ontario Securities Commission's jurisdiction

Selling Securities to the Public

- Management must obtain permission from the Board of Directors

- Firm must prepare and distribute copies of a preliminary prospectus (red herring) to the OSC and to potential investors

- OSC studies the preliminary prospectus and notifies the company of required changes (usually takes 2 weeks)

- When the prospectus is approved, the price is determined and security dealers can begin selling the new issue

Alternative Issue Methods

- For equity sales, there are two kinds of public issues:

  - General Cash Offer – New securities offered for sale to the general public on a cash basis.

  - Rights Offer – New securities are first offered to existing shareholders. These are more common outside North America.

Table 15.1 – Methods of Issuing New Securities

Method	Type	Definition
Public Traditional negotiated cash offer	Firm commitment cash offer	Company negotiates an agreement with an investment banker to underwrite and distribute the new shares. A specified number of shares are bought by underwriters and sold at a higher price.
	Best efforts cash offer	Company has investment bankers sell as many of the new shares as possible at the agreed-upon price. There is no guarantee concerning how much cash will be raised.
	Dutch auction cash offer	Company has investment bankers auction shares to determine the highest offer price obtainable for a given number of shares to be sold.
Privileged subscription	Direct rights offer	Company offers the new stock directly to its existing shareholders.
	Standby rights offer	Like the direct rights offer, this contains a privileged subscription arrangement with existing shareholders. The net proceeds are guaranteed by the underwriters.
Nontraditional cash offer	Shelf cash offer	Qualifying companies can authorize all shares they expect to sell over a two-year period and sell them when needed.
	Competitive firm cash offer	Company can elect to award the underwriting contract through a public auction instead of negotiation.
Private	Direct placement	Securities are sold directly to the purchaser, who, at least until recently, generally could not resell securities for 4 months.

IPOs and SEOs

- IPO – Initial Public Offering (or unseasoned new issue). A company's first equity issue made available to the public.

- SEO – Seasoned Equity Offering. A new issue for a company that has previously issued securities to the public.

Underwriters

- Services provided by underwriters
  - Formulate method used to issue securities
  - Price the securities
  - Sell the securities
  - Price stabilization by lead underwriter
- Syndicate – group of underwriters that market the securities and share the risk associated with selling the issue
- Spread – difference between what the syndicate pays the company and what the security sells for in the market

Firm Commitment Underwriting

- Also called a "bought deal"
- Issuer sells entire issue to underwriting syndicate
- The syndicate then resells the issue to the public
- The underwriter makes money on the spread between the price paid to the issuer and the price received from investors when the stock is sold
- The syndicate bears the risk of not being able to sell the entire issue for more than the cost
- Most common type of underwriting in Canada

Best Efforts Underwriting

- Underwriter must make their "best effort" to sell the securities at an agreed-upon offering price

- The company bears the risk of the issue not being sold

- The offer may be pulled if there is not enough interest at the offer price. In this situation, the company does not get the capital and they have still incurred substantial flotation costs

Dutch Auction Underwriting

- Underwriter conducts an auction and investors bid for shares

- Offer price is determined based on the submitted bids

- More commonly used in bond markets

- Also called uniform price auction

Over allotment Option

- Over allotment Option / Green Shoe provision
  - Allows syndicate to purchase an additional 15% of the issue from the issuer
  - Allows the issue to be oversubscribed
  - Provides some protection for the lead underwriter as they perform their price stabilization function

Additional Details

- Lockup Agreements – Specify how long insiders must wait after an IPO before they can sell stock, usually 180 days

- Quiet Period – For 40 days following an IPO, the OSC requires that all communications with the public are limited to ordinary announcements

IPO Under pricing

- Initial Public Offering – IPO
- May be difficult to price an IPO because there isn't a current market price available
- Additional asymmetric information associated with companies going public
- Underwriters want to ensure that their clients earn a good return on IPOs on average
- Underpricing causes the issuer to "leave money on the table"

Table 15.3 – Average First-Day Returns

Year	Number of Offerings*	Average First-Day Return, %†	Gross Proceeds, $ Millions‡
1975	12	−1.5	262
1976	26	1.9	214
1977	15	3.6	127
1978	20	11.2	209
1979	39	8.5	312
1980	75	13.9	934
1981	197	6.2	2,366
1982	82	10.6	1,064
1983	522	9.0	11,323
1984	222	2.6	2,841
1985	216	6.2	5,492
1986	485	5.9	16,349
1987	344	5.6	13,069
1988	129	5.4	4,181
1989	120	7.9	5,402
1990	113	10.4	4,480
1991	288	11.7	15,771
1992	397	10.0	22,204
1993	507	12.7	29,257
1994	416	9.7	18,300
1995	465	21.0	28,872
1996	666	16.5	42,479
1997	484	13.9	33,218
1998	319	20.0	35,112
1999	490	69.1	65,460
2000	385	55.4	65,677
2001	81	13.7	34,368
2002	71	8.5	22,220
2003	67	12.3	10,114
1975–79	112	5.7	1,124
1980–89	2,392	6.8	63,021
1990–99	4,145	20.9	295,153
2000–03	604	39.5	132,379
1975–2003	7,253	17.6	491,677

Figure 15.1 – Average Initial Returns for SEC-Registered IPO's: 1960 to 2003

FIGURE 15.1

Average initial returns by month for SEC-registered Initial Public Offerings: 1960–2003
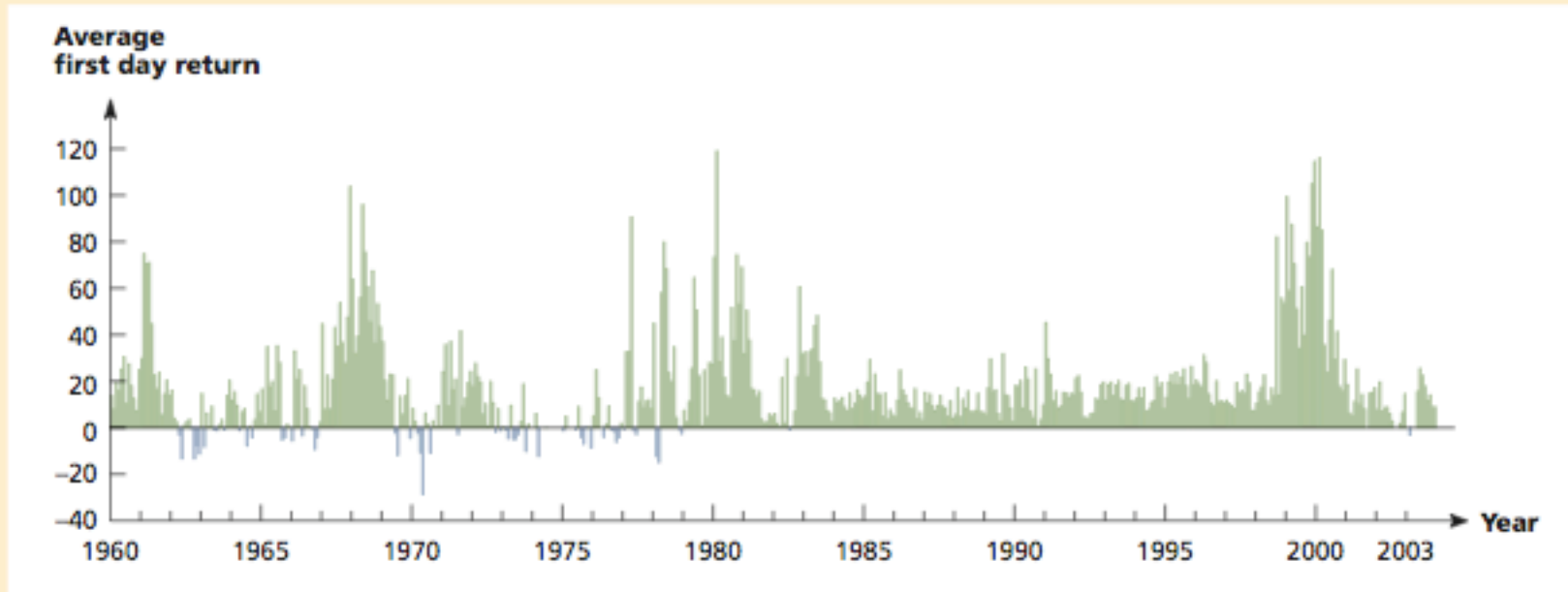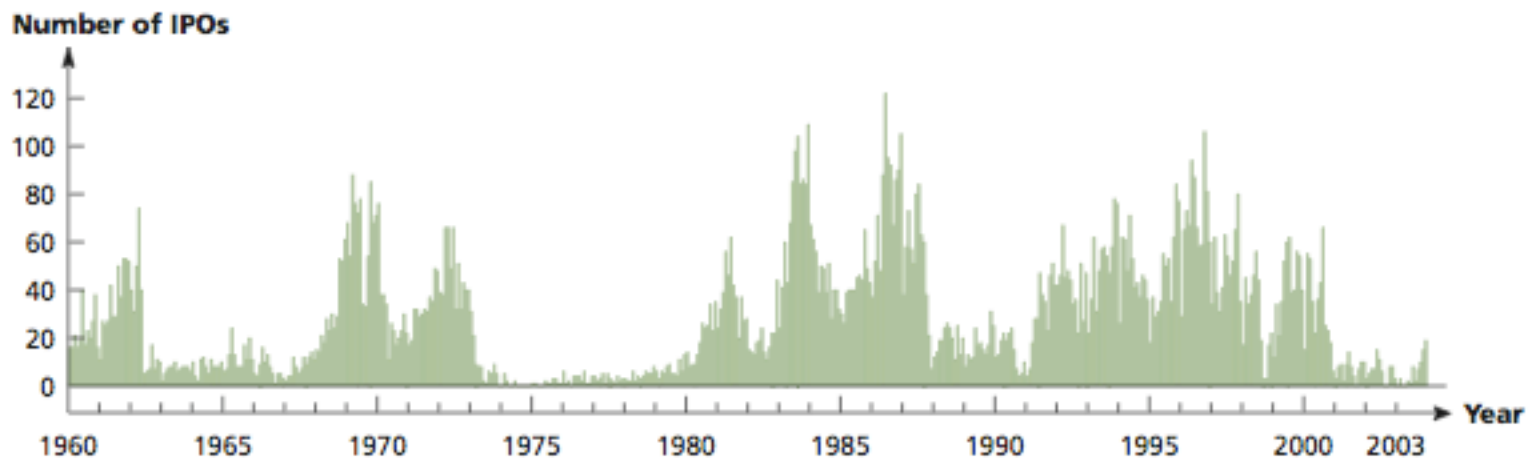

Source: Roger G. Ibbotson, Jody L. Sindelar, and Jay R. Ritter, "The Market's Problems with the Pricing of Initial Public Offerings," *Journal of Applied Corporate Finance* 7 (Spring 1994), as updated by the authors.

Figure 15.2 – Number of Offerings for SEC-Registered IPOs: 1960 to 2003

FIGURE 15.2

Number of offerings by month for SEC-registered Initial Public Offerings: 1960–2003

Source: Roger G. Ibbotson, Jody L. Sindelar, and Jay R. Ritter, "The Market's Problems with the Pricing of Initial Public Offerings," *Journal of Applied Corporate Finance* 7 (Spring 1994), as updated by the authors.

New Equity Issues and Price 15.6

- Stock prices tend to decline when new equity is issued

- Possible explanations for this phenomenon
  - Managerial information and signaling
  - Debt usage and signaling
  - Issue costs

- Since the drop in price can be significant and much of the drop may be attributable to negative signals, it is important for management to understand the signals that are being sent and try to reduce the effect when possible

The Cost of Issuing Securities 15.7

- Spread
- Other direct expenses – legal fees, filing fees, etc.
- Indirect expenses – opportunity costs, i.e., management time spent working on issue
- Abnormal returns – price drop on existing stock
- Underpricing – below market issue price on IPOs
- Over allotment (Green Shoe) option – cost of additional shares that the syndicate can purchase after the issue has gone to market

Rights Offerings: Basic Concepts 15.8

- 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

The Value of a Right

- The price specified in a rights offering is generally less than the current market price

- The share price will adjust based on the number of new shares issued

- The value of the right is the difference between the old share price and the "new" share price

Rights Offering Example

- Suppose a company wants to raise $10 million. The subscription price is $20 and the current stock price is $25. The firm currently has 5,000,000 shares outstanding.
  - How many shares have to be issued?
  - How many rights will it take to purchase one share?
  - What is the value of a right?

Rights Offering Example continued

Number of new shares to be issued

$$= \frac{\text{Funds to be raised}}{\text{Subscription Price}} = \frac{10,000,000}{20} = 500,000$$

Number of rights to purchase one new share

$$= \frac{\text{Old Shares}}{\text{New Shares}} = \frac{5,000,000}{500,000} = 10$$

$$\text{Value of a right} = \frac{M_0 - S}{N + 1} = \frac{25 - 20}{10 + 1} = \$0.45$$

More on Rights Offerings

- Ex-rights – the price of the stock will drop by the value of the right on the day that the stock no longer carries the "right"
- Standby underwriting – underwriter agrees to buy any shares that are not purchased through the rights offering
- Stockholders can either exercise their rights or sell them – they are not hurt by the rights offering either way
- Rights offerings are generally cheaper
- Until the early 1980's, rights offerings were the most popular method of raising new equity in Canada
- Bought deals have replaced rights offers as the prevalent form of equity issue

Dilution 15.9

- Dilution is a loss in value for existing shareholders
  - Percentage ownership – shares sold to the general public without a rights offering
  - Market value – firm accepts negative NPV projects
  - Book value and EPS – occurs when market-to-book value is less than one

Types of Long-term Debt 15.10

- Bonds – public issue of long-term debt
- Private issues
  - Term loans
    - Direct business loans from commercial banks, insurance companies, etc.
    - Maturities 1 – 5 years
    - Repayable during life of the loan
  - Private placements
    - Similar to term loans with longer maturity
    - Easier to renegotiate than public issues
    - Lower costs than public issues