

Long-Term Financing

Chapter 12

Corporate long-term financing is generated either internally or externally. Internally generated financing is financing derived from operating cash flow; the major external sources are long-term debt, preferred stock and common stock. The major emphasis of this chapter is on the description of the main features of these sources.

A) Corporate Long-Term Debt

A debt is a promise to repay principal (the original amount of the loan) plus interest, at a specified time to the *lender, or creditor*. The corporation is the *debtor or borrower*, and the amount owed to the creditor is a liability of the corporation.

Three features distinguish debt from equity

- a) Debt does not represent an ownership interest; creditors have no voting power
- b) Interest paid on debt is tax-deductible; dividends paid to shareholders are not.
- c) Failure to pay creditors can result in bankruptcy; thus there is a cost of issuing debt which is not present if the firm issues equity.

a) Long-Term debt: The basics:

Debt securities are often classified according to the maturity of the debt, which is the length of time that an unpaid balance remains outstanding. Debt that matures within one year is considered **short-term**; debt with a maturity greater than one year is considered **long-term debt**.

Corporate debt securities are either **notes, debentures, or bonds**. Strictly speaking, a bond is secured bond, the word bond is used generically. A note is a debt security with a maturity less than ten years.

Debt could be public and private. Public debt is sold to the general public. Private debt is negotiated directly between the borrower and the lender, and the security is issued directly to the lender, rather than to the public.

Other features of long-term debt: Security, Call features, sinking funds, ratings, and protective covenants.

The **indenture** is the written agreement between the corporation and its bondholders. The indenture sets forth the terms of the loan and identifies all **protective covenants** which restrict certain actions on the part of the corporation. The indenture also identifies the **trustee**, who is appointed by the corporation to represent the bondholders. The trustee's job is to make sure that the terms of the indenture are obeyed.

Terms of a Bond: Long-term corporate debt is generally in the form of a bond with a principal (face) value of \$1000. Annual interest is generally specified as a coupon rate equal to a percentage of face value;

interest payments are made semi-annually. A bond with interest payments equal to 8.4% of face value might pay \$42 on March 1 and September 1 of each year. Principal, plus the last interest payment, is repaid to the bondholder on the maturity date.

Bonds can be either **registered bonds or bearer bonds**. For **registered bonds**, the company mails the interest payment directly to the owner of record. **Bearer bonds** have dated coupons attached. The bondholder must detach a coupon and mail it to the company; the company mails the interest payment to the coupon holder. Ownership of a bearer bond is not registered with the company. Therefore, recovery is more difficult if the bonds are sold or stolen. However, since bearer bonds are not easily traceable, they may have advantages to some investors.

Security: Debt securities differ with regard to the collateral pledged as security for the repayment of debt. Mortgage securities are secured by a mortgage on real property, usually real estate. The mortgage is described in a legal document called the mortgage-trust indenture or trust deed.

A **debenture** is not secured by specific property. Most of the corporate bonds issued today are debentures, although public utilities and railroads issue primarily mortgage bonds.

Seniority: Seniority governs priority of payment to creditors in the event of bankruptcy. Some debt is subordinated, which means that other creditors must be repaid first in the event of bankruptcy.

Repayment: A corporation may repay the face value of a bond at maturity, but most corporate bonds are repaid prior to maturity. For public issues, repayment takes place through the use of sinking funds or a call provision. A **sinking fund** requires the corporation to make annual payments to the bond trustee, who then repurchases bonds. Bonds may be either repurchased in the open market or selected by lottery and redeemed at a specified price.

Sinking funds arrangement vary. Most start between five and ten years after the original issue date. Some call for equal annual payments throughout the life of the bond. The amount paid into the sinking fund may insufficient to redeem the entire issue so that the corporation must make a large “balloon” payment at maturity. Sinking funds provide additional security to bondholders by providing for the orderly retirement of debt and by serving as an early warning system regarding potential problems.

The Call Provision: A call provision allows the company to repurchase or call, the entire debt issue prior to maturity at a specified price. **Most debentures are callable**. The call price is usually the face value of the bond plus a **call premium**. The call premium might be on year’s interest initially and decrease every year as maturity approaches. Often bonds cannot be called for some number of years following issue (**deferred call**) and are said to be **call protected** during this period.

Protective Covenants: A protective covenant restricts certain actions of the company. **A negative covenant** such as dividend restriction disallows certain actions. **A positive covenant** (such as a requirement that working capital be maintained at a specified minimum level) requires that certain

actions be taken by the corporation.

b) Some different kinds of bonds:

Several types of bonds are available to investors, including short term and long term, high risk and low risk, and taxable and nontaxable. Bonds can take many forms depending on whether they are money market instruments (Treasury bills, Commercial papers, Banker's acceptances, Negotiable certificates of deposit, Repurchase agreements, Federal funds, and Eurodollars), or capital market instruments (U.S. Treasury notes and bonds, Federal agency bonds, Municipal and corporate bonds, and Mortgages and mortgage-backed securities).

Corporate bonds are issued to finance investment in new plant equipment (real assets). These bonds usually have a par or face value of \$1000. Corporate bonds vary in their riskiness and their returns to investors. Some highly rated bonds are very safe but pay low interest. **Junk bonds**, in contrast, are very risky and this pay much higher interest. For such bonds, there is a higher risk that the firm will go bankrupt and the investor will lose the entire investment- hence, the name junk bonds.

Some bonds do not pay any interest and called **zero-coupon bonds (or stripped bonds)**. Bonds that make payments during the life of the bond are **coupon-bearing bonds**.

1) Stripped bonds: Bonds that pay no coupons are called stripped bonds. These bonds sell at a price much lower than the par value.

2) Floating-Rate bonds: The coupon interest payments on a floating-rate bond are adjusted as interest rates change. The adjustment is based on an index like the treasury bill rate.

3) Other types of bonds: Income bond depends on the income of the corporation, that is the company is obliged to make interest payment only if income is sufficient. Income bonds offer the advantage of the tax deduction for interest expense, without the risk of financial distress; an income bond is not in default when a coupon payment is omitted due to insufficient income. Despite these important advantages, corporations rarely issue income bonds. Other kinds of bonds include **convertible bonds and retractable bonds**(put bonds), which will be discussed later.

c) Bond Ratings:

Two bond ratings agencies in Canada rate the credit assigned to bonds; (CBRS, and DBRS). In USA, they are Moody's Investor Services and Standard & Poor's Corporation (S&P). Bonds are rated according to the likelihood of default and the protection afforded the bondholders in the event of default. The two highest ratings are AAA and AA (DBRS) or A++ and A+ (CBRS). These ratings indicate a very low probability of default. Bonds rated at least BBB(DBRS) or B++ (CBRS) are considered

investment grade, while lower-rate bonds are referred to as low-grade or high-yield bonds; these are also commonly called “**junk**” bonds. A bond that is in default is given a C rating. Because of their higher risk, bonds with lower ratings pay higher interest rates.

B) Stocks:

a) Preferred Stocks:

Preferred shareholders must be paid a stated dividend before dividends can be paid to common shareholders. Thus, preferred stock is a “**hybrid security**” that has some properties of bonds and some properties of stocks. If the firm liquidates, the claim of preferred shareholders has priority over that common shareholders. Preferred shares usually do not have voting rights.

A corporation is not legally obligated to pay dividends on preferred stock. If dividends are **cumulative**, then any dividend not paid are accumulated, and the entire amount must be paid before any dividends on common stock can be paid. So **cumulative preferred stocks** are stocks whose dividends accumulate if they are not paid. Usually, preferred shareholders are granted voting rights if some specified number of dividends have not been paid. We have also **Participating preferred stocks** which are stocks whose dividends are tied to the success of the firm according to some formula in the earnings of the firm.

Investors are attracted to preferred stocks, but they sometimes overlook the risk. It is true that preferred stock may provide a relatively high yield, but this high yield is not guaranteed. Also, if the firm goes bankrupt, the preferred stockholder stands in the credit line behind bondholders. A company’s failure to pay preferred stock dividends, however, does not result in bankruptcy. Sometimes the firm can even call back the preferred stock, thus avoiding the high dividend. Finally, owners of preferred stocks do not enjoy the same benefits as owners of common stock when the firm is doing well. That is, the common stock price could increase sharply, offering stockholders high capital gains. However, the preferred stock price gains are limited, much like the earning potential of bonds.

Note: A preferred share normally has a stated liquidating value. For example, a share of preferred stock might be identified as an “**\$8 preferred**”, indicating a dividend yield equal to 8% of the stated value.

Why a corporation would ever choose to issue a preferred stock rather than debt securities. Three reasons are commonly cited:

- Most preferred stock is issued by regulated public utilities; these firms are allowed to pass the additional cost of preferred stock on to the consumers.
- Preferred stock, unlike debt, does not increase the firm’s risk of bankruptcy.

- Preferred stockholders do not have voting rights; so firms can issue preferred stock without affecting control of the corporation.

b) Common Stocks:

Owners of corporate common stock are called **stockholders** or **shareholders**. They receive stock certificates representing ownership of the shares. Some stocks have a stated value, or par value, listed on the stock certificate. Most Canadian stocks, however, have no particular par value. The difference between the equity contributed directly to the corporation by stockholders and the par value is called the Contributed Surplus.

Retained Earnings:

In any given year, the portion of net income not paid as dividends is retained in the business, and is referred to as **retained earnings**. The sum of cumulative retained earnings, share capital and adjustments to equity comprise the common equity (**net worth**) or **book value** of the corporation.

The book value per share is total book value divided by the number of shares outstanding. The number of shares outstanding is equal to the number of shares issued less the number repurchased by the corporation. Repurchased stock is called **treasury stock**. If a stock is publicly traded, its market value is usually different from its book value. The total market value is therefore the number of common shares outstanding times the market value per share.

Shareholders'rights:

Shareholders control the corporation by electing directors who then hire management. Directors are elected each year at the annual shareholders meeting. The voting mechanism is either **straight voting** or **cumulative voting**.

With **straight voting**, each share entitles the shareholder to one vote and each director is elected separately. For example, if four directors are to be elected and you own 100 shares, you cast 100 votes in each of the four separate elections. With **cumulative voting**, the directors are elected simultaneously and the number of votes a shareholder may cast is equal to the number of shares owned multiplied by the number of directors to be elected. In the above example, if cumulative voting were used, you could cast all 400 of your votes for a single director. Cumulative voting improves your chances of electing a specific individual to the board, which is the reason that cumulative voting makes it easier for minority shareholders to achieve representation on the board of directors.

Dividends:

Corporations, at the discretion of the board of directors, pay cash dividends to shareholders. The corporation is not legally obligated to declare dividends, and therefore cannot bankrupt if it fails to pay

dividends.

Corporations may have different classes of common stock with different voting rights. The usual reason for multiple classes of stock is to allow one group of shareholders to control the corporation by granting, for example, 60% of the voting rights to one class of stock held by that group. This class of stock is often held by corporate management or founding shareholders. Other classes of non-voting stock must receive dividends no lower than dividends on voting shares and comprise approximately 15 percent of the market value of TSE listed shares at the end of 1989. The dual classes of stock have to do with the control of the firm.

Common stocks also classified using the following categories: (1) growth, (2) income, (3) blue chip, (4) speculative, (5) cyclical, and (6) defensive. A stock may be classified in more than one category. For example, WalMart stock is rates as both growth and blue chip.

- **Growth stocks:** are usually common stocks of smaller firms having sales and earnings growth in excess of the industry average. The company pays very low or no dividends and reinvests its earnings for expansion. For example, Microsoft Corporation had recorded sales and earnings growth rates in excess of 20% per year from 1988 to 1997. To date, Micorsoft has not paid any cash dividends.
- **Income stocks:** are common stocks of older, more mature firms that pay high dividends and are not growing rapidly. Stocks of utility companies are examples of income stocks. Income stocks are usually in low-risk industries, and their prices increases little, if at all.
- **Blue Chip stocks:** are common stocks of large, financially sound corporations with a good history of dividend payments and consistent earnings growth. These stocks tend to have very little risk of default. Proctor and Gamble. Blue chip stocks have more capital gains potential than do income stocks.
- **Speculative stocks:** are the opposite of blue chip stocks. These are stocks with a higher than average possibility of gain or loss, due to the fact that they are very risky and have considerable short-term volatility.
- **Cyclical stocks:** are common stocks that tend to move with the business cycle. When the economy is doing well, these stocks do well. When the economy is in the recession, these stocks do poorly. Ford Motor Company is a cyclical stock, as are other automobile makers. Automobile sales are typically a leading indicator of economic activity. Hence, as the economy slips into a recession, so do the earnings of automobile companies. Ford recorded large income gains during

the expansion years in late 1980s, but the company experienced sizable losses in the recession of the early 1990s.

- **Defensive stocks:** are the opposite of cyclical stocks, in a sense. Defensive stocks tend to do relatively well in recessionary periods but do not do very well when the economy is booming. These stocks are more difficult to find than cyclical stocks. Stocks of automobile-parts makers may be defensive. When the economy is in a recession, consumers are much more likely to attempt to maintain their motor vehicles rather than purchase new ones. Hence, sales by auto-parts makers tend to increase in recessions and decrease in expansions.

Callable Bonds and Bond Refunding

Bond refunding is the process of replacing all or part of a bond issue. Call provisions have value to the issuing firm; if interest rates decline subsequent to the original issue of the bond, the firm has the option to replace the bond issue with bonds paying a lower interest rate. On the other hand, a call provision is disadvantageous for bondholders; bonds are called when interest rates decline, so that bondholders are forced to sell their bonds back to the issuing company, and are then unable to earn a return on their investment equal to that earned on the called bond. Consequently, bondholders require compensation for the possibility that their bonds may be called away. As a result, a firm must pay a higher interest rate on a callable bond than on a comparable non-callable bond.

a) The Call Provision

Cost of the Call Provision:

Suppose a firm plans to issue a perpetual bond which pays a 9% interest. There is an equal chance that the market interest rate will be either 11.25% or 7.5% one year from now. What is the price of the bond today if it is not callable. The price is the **present value of next year's coupon interest payment** plus the **present value of next year's expected price**. Since the bond is a perpetuity, its value at the end of the year will be either $(\$90/.1125) = \800 , or $(\$90/.075) = \$1,200$. The expected value of the future price is $(.5(\$800) + .5(\$1200)) = \$1000$. Therefore, the price of the bond today is:

$$P_{NC} = (\$90 + \$1000)/1.09 = \$1000$$

Where P_{NC} is the price of the bond if **it is not callable**.

Now suppose the bond described above is callable next year at \$1090, and that it will be called if the interest rate drops to 7.5%.

What must the coupon interest payment (C) be in order for the firm to be able to issue the bond at the par value of \$1000. At the end of the year, the bondholder will have an interest payment of C dollars plus either \$1090 (**the call price**) or a **bond worth** $(C/.1125)$. The expected value of the future price is:

$$(.5(\$1090) + .5(C/.1125))$$

In order for the bond to sell for \$1000 today, the present value of the coupon payment (C) plus the present value of the expected future price must equal \$1000:

$$P_C = \$1000 = [C + (.5(\$1090) + .5(C/.1125))] / 1.09$$

where P_C is the price of the callable bond. Solving for C , we find that the coupon payments must be \$100.10. This coupon interest payment the firm must pay to sell the callable bond for \$1000. (Recall that the coupon interest payment for the noncallable bond is \$90).

The cost of the call provision to the issuing firm can be determined by computing the price at which the firm could sell a bond with $C = \$100.10$ if the bond is not callable. The price (P_{NC}) is equal to the present value of next year's coupon interest payment plus the present value of next year's price. Since the bond is a perpetuity, its value at the end of the year will be either $(\$100.10/.075) = \1334.67 or $(\$100.10/.1125) = \889.78 . The expected value of next year's price is $[.5(\$1334.67) + .5(\$889.78)] = \$1112.225$.

$$P_{NC} = [\$100.10 + \$1112.225] / 1.09 = \$1112.22$$

The difference between P_{NC} and P_C is $(\$1112.22 - \$1000) = \$112.22$, so the firm is paying \$112.22 for the call option.

b) Value of the Call Provision

The value of the call provision is the present value of the firm's interest savings minus the present value of the call premium. If the bond in the above example is called one year from now, the coupon interest payment would decline from \$100.10 to $(.075 \times \$1000) = \75 , for interest savings of $(\$100.10 - \$75) = \$25.10$. This is a perpetuity of \$25.10, which has a present value, as of next year, of $(\$25.10/.075) = \334.67 . However, the call premium next year will be \$90, so the net savings equals $(\$334.67 - \$90) = \$244.67$. Since there is only a 50% probability that the interest rate will decline, there is only a 50% probability that the savings will be realized; therefore, the expected value of the savings is $(.5 \times \$244.67) = \122.335 and the present value is $(\$122.335/1.09) = \112.23 . Except for a rounding error, this is identical to the cost of the call provision computed earlier. This result indicates that the net present value of the call provision, to either the issuer or the bondholder is zero, because the bondholders require compensation for the call provision which exactly offsets their expected loss.

c) When Should Firms Refund Callable Bonds

A firm should refund callable bonds when the net present value of the refunding is positive. In other words, the firm will refund the callable bonds next year if the net present value of the transaction, at that time, is positive. If the market rate of interest declines to 7.5% one year from now, then the present value of the savings on interest payments is the present value of the \$25.10 perpetuity, or $(\$25.10/.075)$

= \$334.67. Since the call premium is \$90, the net present value is $(\$334.67 - \$90) = \$224.67$, as we computed earlier. The bond should be refunded next year if the market interest rate declines to 7.5%, because the net present value of the refunding at that time, would be positive.

A) Preemptive Rights offerings:

Corporations can place equity securities directly with its existing stockholders through a **rights offering**. In a rights offering, a company's stockholders are given the right to purchase additional shares at a slightly below-market price in proportion to their current ownership in the company. Stockholders can exercise their rights or sell them. A rights offering insures that the current shareholders may maintain their proportionate equity interest in the corporation.

The price at which the new shares can be purchased is called the **subscription price**. For the shares sold via the rights offering, the underwriting services of an investment banker are not needed. However, his services might be needed for the distribution of common stock that is not subscribed to. A **standby underwriting arrangement** will be used, calls for the underwriter to buy the unsubscribed shares, and the corporation pays a **standby fee** to the investment banking firm.

To demonstrate how rights offering works, we will use an illustration. Suppose that the market price of the stock of ABC corporation is \$20 per share and that there are 30,000 shares outstanding. Thus, the capitalization of this firm is \$600,000. Suppose that the company is considering a rights offering in connection with the issuance of 10,000 new shares. Each current shareholder will receive one right for every three shares owned. The terms of the rights offering are as follows: for three rights and \$17 (**the subscription price**) a new share can be acquired. The subscription price must be always be less than the market price or the rights will not be exercised. However, we will see that the amount of the discount (the difference between the market price and subscription price) is relevant. In our case the subscription price is 15% (\$3/\$20) below the market price.

Other important considerations include the choice to transfer the rights. This is done by selling the right in the open market. This is important since the right has a market value and that value can be captured by selling the right. The second element is the time when the right expires - when it can no longer be used to acquire the stock. Typically that time is short.

The value of a right can be found by taking the price of a share before the rights offering and subtracting the price of a share after the rights offering. That is:

Value of a right = price before rights offering - price after rights offering or equivalently,

value of a right = share price rights on - share price ex rights.

The table shows the impact of the rights on the price of a share for the ABC corporation. The price after the rights offering will be \$19.25. Therefore, the value of a right is \$0.75 (\$20-\$19.25).

Before rights issue

Capitalization.....\$600,000

Number of shares.....	30,000
Share price (rights on)	\$20.00
After issuance of shares via rights offering	
Number of shares.....	40,000 = (30,000 + 10,000)
Capitalization	\$770,000 = (\$600,000 + 10,000 ×\$17)
Share price (ex rights).....	\$19.25 (= \$770,000/40,000)
Value of one right.....	\$0.75 = (\$20.00 - \$19.25)
Net gain or loss to initial stockholder	
Loss per share due to dilution	0.75 (= 3.75%×\$20)
Gain per share from selling or exercising a right.....	\$ 0.75
Net gain or loss.....	0.

The difference between the price before the rights offering and after the rights offering expressed as a percentage of the original price is called the **dilution effect** of the rights issue. In the present case, the dilution effect is \$0.75/\$20, or 3.75%. The dilution is larger, the larger the ratio of old and new shares, and the larger the discount.

B) More on Rights

An issue of common stock offered to existing shareholders is called a **rights offering**. In a rights offering, each shareholder is issued one right for every share owned. The rights give the shareholder an option to buy a specified number of new shares from the firm at a specified price within a specified time, after which time the rights are said to expire.

To illustrate the various considerations of rights offering, consider a situation faced by ABC company. ABC earns \$2 million after taxes and has 1 million shares outstanding. Earning per share are thus \$2, and the stock sells for \$20, or 10 times earnings (that is the price-earnings ratio is 10). To fund a planned expansion, the company intends to raise \$5 million of new equity funds by a rights offering.

Balance sheet

Assets.....	Liabilities
Total	Shareholders' equity
.....	Common Stock.....
.....	Retained Earnings.....

Income Statement

Earnings before taxes.....	\$3,333,333
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Taxes (40%).....	1,333,333
Net Income.....	2,000,000
Earnings per share.....	2
Shares outstanding.....	1,000,000
Market Price per share.....	\$20
Total Market Value.....	\$20,000,000

Some questions have to be answered to execute the rights offering: What should the price per share be for the new stock. How many shares will have to be sold. How many shares will each shareholder be allowed to buy. And what is the likely effect of the rights offering on the per share value of the existing stock.

Shareholders of ABC company have several options: (1) exercise and subscribe to the entitled shares, (2) sell the rights, or (3) and let the rights expire. This is not advised since the rights have value.

Number of rights Needed to purchase a share:

ABC wants to raise \$5 million in new equity. Suppose that the subscription price is \$10 per share. At \$10 per share, ABC will have to issue 500,000 new shares. That can be determined from the following:

$$\text{Number of new shares} = \text{Funds to be raised} / \text{Subscription price} = \$5,000,000 / \$10 = 500,000$$

Because stockholders always get one right for each share of stock they own, 1 million rights would be issued by ABC. To determine how many rights are needed to buy one new share of stock, we can divide the number of existing outstanding shares of stock by the number of new shares:

$$\text{Number of rights needed to buy a share of stock} = \text{Old Shares} / \text{New Shares} = 1,000,000 / 500,000 = 2 \text{ rights}$$

Thus, a shareholder needs to give up two rights plus \$10 to receive a share of new stock. If all shareholders do that, then the ABC could raise the required capital.

The Value of a Right

Rights have value. In the case of ABC the right to be able to buy a share of stock worth \$20 for \$10 is worth something. Suppose that a shareholder owns two shares of stock just before the rights offering. So the shareholder's holding is worth $2 \times \$20 = \40 . The ABC rights offer gives shareholders with two rights the opportunity to purchase one additional share for \$10.

The shareholder has two shares receives two rights. The holding of the shareholder who exercises these rights and buys the new share would increase to three shares. The total investment would be \$40 + \$10 = \$50.

The shareholder now holds three shares (remember the new share bought has no right and old shares rights have been exercised). Since the total cost of buying the three shares is \$50, then the per share price must be $\$50/3 = \16.67 .

To illustrate:

Initial Position

Number of shares.....2
 Share price.....\$20
 Value of holding.....\$40

Terms of Offer

Subscription price.....\$10
 Number of rights issued.....2
 Number of rights for a new share.....2

After Offer

Number of shares.....3
 Value of Holdings.....\$50
 Share price.....\$16.67

Value of a right:

Old Price - New Price\$20 - \$16.67 = \$3.33

What about if all shareholders exercise their rights, we get:

Initial Position

Number of shares.....1 million
 Share price.....\$20
 Value of a firm.....\$20 million

Terms of Offer

Subscription price.....\$10
 Number of rights issued.....1 million
 Number of rights for a new share.....2

After Offer

Number of shares.....1.5 million
 Share price.....\$16.67

Value of a firm.....\$25 million

Value of a right:

Old Price - New Price\$20 - \$16.67 = \$3.33

The number of shares increases to 1 million + .5 million = 1.5 million. The value of the firm increases to \$20 million + 5 million = \$25 million. The value of each share drops to \$25 million/1.5 million = \$16.67 after the rights offering.

Good Point: Although holding no shares of outstanding ABC stock, an investor who wants to subscribe to the new issue can do so by buying some rights. Suppose an outside investor buys two rights. This costs $3.33 \times 2 = \$6.67$. If the investor exercises the rights at a subscription price of \$10, the total cost would be $\$10 + \$6.67 = \$16.67$. In return for this cost, the investor receives a share of the new stock, which is worth \$16.67.

Example:

Suppose that in the ABC case, the subscription price was set at \$8. How many shares have to be sold. How many rights would you need to buy a new share. What is the value of a right. What will the price per share be after the rights offer.

To raise \$5 million, $\$5\text{million}/\$8 = 625,000$ shares needed to be sold. There are 1 million shares outstanding, so it will take $1\text{ million}/625,000 = 1.6$ rights to buy a new share of stock (you can buy five new shares for every eight you own). After the rights offer, there will be 1.625 million shares, worth \$25 million all together, so the per share value is $\$25/1.625 = \15.38 each. The value of a right is the \$20 original price less the \$15.38 ending price, or \$4.62.

Theoretical Value of a Right:

We can summarize the discussion with an equation for the theoretical value of a right during the rights-on period:

$$R_0 = (M_0 - S)/(N + 1) \tag{0.1}$$

Where:

M_0 = Common share price during the right-on period

S = Subscription price

N = Number of rights required to buy one new share

For the example given above, we get:

$$R_0 = (M_0 - S)/(N + 1) = (\$20 - \$8)/(1.6 + 1) = \$4.62.$$

Ex-Rights

For rights offering, the firm establishes the holder-of-record date; an investor who is a “holder-of-record” on that date receives one right for each share owned. According to stock exchange rules, the ex-rights date is four business days prior to the holder-of-record date. An investor must purchase the stock prior to the ex-rights date in order to be considered the owner of the stock on the holder-of-record date. If a share is sold before the ex-rights date, it is said to be trading “rights-on” or “cum rights”, and the purchaser receives the right; at the close of trading day on the fifth day prior to the holder-of-record date, the stock goes ex-rights, so that any subsequent purchaser does not receive the right. At the start of trading on the next day, which is the ex-rights date, the price of the stock decreases by the value of the right.

When the stock goes ex-rights, the price drops by the value of one right. However, even when the stock sells “ex-rights” investors can exercise their rights, and buy new shares, until the rights offering expires. The value of a right during ex-rights period is:

$$M_e = M_o - R_o$$

$$R_e = (M_e - S)/N$$

where M_e = common share price during the ex-rights period.

Effects on Shareholders:

Shareholders can exercise their rights or sell them. In either case, the shareholder does not win or lose by the rights offering. A shareholder who has two shares of ABC stock has a portfolio of \$40. If the shareholder exercises the rights, he or she ends up with three shares worth a total of \$50. By spending \$10, the investor’s holding increases in value by \$10, which means the shareholder is neither better nor worse off.

On the other hand, if the investor sells the two rights for \$3.33 each, he or she would obtain $\$3.33 \times 2 = \6.67 and end up with two shares worth \$16.67 and the cash from selling the right:

$$\text{Shares held} = 2 \times \$16.67 = \$33.33$$

$$\text{Rights sold} = \$3.33 \times 2 = \$6.67$$

So the total = \$40.00, so the shareholder cannot lose or gain from exercising or selling rights.

C) Dilution

Dilution is a decrease in the value of the common stockholders' position results from the issue of new common stock. There are three aspects of dilution: **(1) dilution of proportionate ownership (2) dilution of book value and earnings per share, and (3) dilution of market value.** We illustrate through an example:

The Polo company currently has 100 shares outstanding; of these, R. Branca owns 40 shares and B. Thompson owns 30 shares. The market value of the firm's stock is \$40 per share. The book value of the firm is \$5000, so that book value per share is \$50. The firm's return on equity (ROE) is 20%. (Recall that **ROE is equal to earnings per share divided by book value per share; alternatively ROE can be defined as net income divided by common equity**). Therefore, earnings per share (EPS) is equal to $(.20 \times \$50) = \10 , and net income is $(0.20 \times \$5000) = \1000 . Net income can also be computed as $(\$10 \times 100) = \1000 .

The firm intends to issue 50 new shares. How does this new issue affect the current shareholders.

1) Dilution of Proportionate Ownership

The impact of the issue of 50 new shares depends on the nature of the new issue. If the new issue is a rights offering, then each existing shareholder will be able to purchase one new share for each two shares he currently owns. For example, Thompson will be able to purchase 15 new shares, and after the rights offering, he will own 45 of 150 shares outstanding. So he will own $(45/150) = 30\%$ of the outstanding shares, the same percentage he currently owns.

If the new issue is a public offering, and if Thompson does not purchase any of the new shares, his ownership will decrease to $(30/150) = 20\%$. So that is his influence on corporate decisions has been reduced.

2) Market Value dilution:

Market Value dilution is a decrease in the market value per share of the firm's stock following the issue of new shares of common stock. Whether market value dilution occurs depends on the purpose of the additional financing obtained by Polo. Suppose that the \$2000 obtained from this issue will be used to finance a capital budgeting project whose net present value is zero. **How will this affect the market value of the firm's stock.**

The market value of the existing stock is \$40 per share, so that the market value of the firm is $(\$40 \times 100) = \4000 .

The financing for the new capital budgeting project will increase the firm's market value to $(\$4000 + \$2000) = \$6000$, and the market price per share will be $(\$6000/150) = \40 .

If, however, the net present value of the capital budgeting project is $+\$450$, then the market value of the firm will increase to $(\$4000 + \$2450) = \$6450$ and the price per share will be $(\$6450/150) = \43 .

Consequently, there is no dilution of market value if the project being financed has a positive net present value.

The Theoretical Value of a Right:

Rights are distributed in a manner similar to cash dividends. That is, there is a date of record and, four business days earlier, an ex-rights date. Before the **ex-rights date**, the value of a right can be calculated by using the following equation:

$$C_0 - (RN + S) = R \quad (0.2)$$

where:

C_0 is the “**rights-on**” market price of the stock.

R is the value of a right.

N is the number of rights needed to buy one share, and

S is the subscription price.

The equation can be interpreted in the following manner. If an investor purchases one share before the ex-rights date, by definition he or she pays the market price of C_0 , shown on the left side of the equation. Alternatively, the investor could purchase the number of rights necessary to buy one share of the new stock at a cost of RN and set aside an amount of money equal to the subscription price S . The total cost of doing this is $RN + S$. The only difference between the two alternatives is that the first one gives the investor not only one share of stock but also one right. Thus, the difference in the cost of the two alternatives, $C_0 - (RN + S)$, must equal to the value of a right, R , as shown in the equation.

The above equation can be written as:

$$R = (C_0 - S)/(N + 1) \quad (0.3)$$

On or after the ex-rights date, the value of a right can be calculated by using the following equation:

$$C_e - (RN + S) = 0 \quad (0.4)$$

where C_e is the ex-rights market price of a share. The reasoning behind this equation is similar to the reasoning behind the previous one. That is, an investor can purchase one share by either buying it in the open market at a cost of C_e or by purchasing the requisite number of rights and setting aside the subscription price, for a total of $RN + S$. Since the purchase of one share ex-rights means the investor does not receive a right, the two alternatives provide the investor with the same item. Thus the cost of these two alternatives should be equivalent, so the difference in their cost should be zero.

The above equation can be written as:

$$R = (C_e - S) / N \tag{0.5}$$