LECTURE 5

Chapter 16:

Long-term Debt and Lease Financing

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Chapter 16: Long-term Debt and Lease Financing

❖ ***Studying Purpose***

- *Analyzing long-term debt requires consideration of the collateral pledged, method of repayment, and other key factors*
- *Bond yields are important to bond analysis and are influenced by how bonds are rated by major bond rating agencies*
- *An important corporate decisions is whether to call in and reissue debt (refund the obligation) when interest rates decline*
- *Long-term lease obligations have many characteristics similar to debt and are recognized as a form of indirect debt by the accounting profession*
- *When the firm fails to meet its financial obligations, it may be subject to bankruptcy*

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Chapter 16: Long-term Debt and Lease Financing

Main Contents:

1. The Debt Contract
2. Bond prices, Yields, and Ratings
3. The Refunding Decision
4. Other Forms of Bond Financing
5. Advantages and Disadvantages of Debt
6. Leasing as a Form of Debt

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I. The Debt Contract

- *The corporate bond represents the basic long-term debt instrument for large corporations*
- ***Par value***
- ***Coupon rate***
- ***Maturity date***

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I. The Debt Contract (cont'd)

❖ ***Security provisions***

- ***Security debt*** *– be one in which specific assets are pledged to bondholders in the event of default*
- ***Mortgage agreement*** *– real property is pledged as security for the loan*
  - *A mortgage may be senior or junior in nature (*)*
- ***After-acquired property clause*** *– requiring that any new property be placed under the original mortgage (*)*
- *The greater the protection offered a given class of bondholders, the lower is the interest rate on the bond*

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I. The Debt Contract (cont'd)

❖ ***Unsecured Debt***

- ***Unsecured debt*** *– the issued debt that is not secured by a specific claim to assets*
- ***Debenture*** *– a long-term, unsecured corporate bond*
- *The trend is to issue unsecured debt rather than a specific lien against an asset*
- ***Subordinated debenture*** *– an unsecured bond in which payment to the holder will occur only after the senior debenture holders are satisfied*

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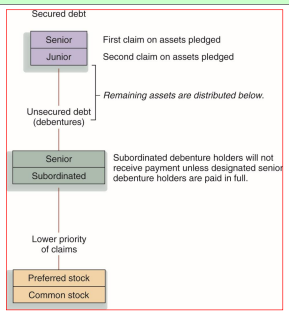
I. The Debt Contract (cont'd)

❖ ***Unsecured Debt*** *(cont'd)*



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II.Bonds (Trái phiếu)

- Bond is the term to describe various of long-term debt a company may issue such as loan notes or debentures, which may be
  - Redeemable: a borrower can repay prior to its maturity
  - Irredeemable
- Bonds or loans come in various forms, including:
  - **Floating rate debentures**
  - **Zero coupon bonds**
  - **Convertible bonds**
  - **Deep discount bonds**
  - **Coupon bond**

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Bonds (Trái phiếu)

- Trái phiếu là thuật ngữ để mô tả nhiều khoản nợ dài hạn mà một công ty có thể phát hành như ghi chú cho vay hoặc các khoản nợ, có thể hoàn lại: người vay có thể hoàn trả trước khi đến hạn,Không thể hoàn trả trước khi đến hạn
- khoản vay có nhiều hình thức, bao gồm:

TP Rủi ro lãi suất thả nổi

Trái phiếu không lãi

Trái phiếu chuyển đổi

TP chiết khấu cao

TP định kỳ trả lãi

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Bond Pricing

- The price of a bond is the Present Value of all cash flows generated by the bond (i.e. coupons and face value) discounted at the required rate of return.

$$PV = \frac{cpn}{(1+r)^1} + \frac{cpn}{(1+r)^2} + \ldots + \frac{(cpn+par)}{(1+r)^t}$$

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Bond Pricing (Contd)

Example

What is the price of a 5.5 % annual coupon bond, with a $1,000 face value, which matures in 3 years? Assume a required return of 3.5%.

$$PV = \frac{55}{(1.035)^1} + \frac{55}{(1.035)^2} + \frac{1{,}055}{(1.035)^3}$$

$$PV = \$1{,}056.03$$

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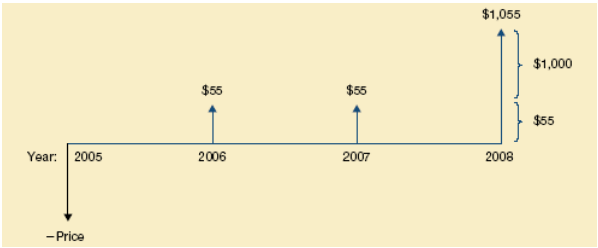
Bond Cash Flows



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Forms of Bond Financing

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- coupon bond - bond has a coupon rate of I, after period time received par value.
- With:
- - I=i*C
- C: face value ; i: interest

$$P_0 = \frac{I}{(1+r_d)^1} + \frac{I}{(1+r_d)^2} + \ldots + \frac{I}{(1+r_d)^n} + \frac{C}{(1+r_d)^n}$$

$$P_0 = I * \frac{1-(1+r_d)^{-n}}{r_d} + \frac{C}{(1+r_d)^n}$$

Ex 1

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- A 10-year Treasury bond is issued with face value of $1,000, paying interest of $50 per year. If market yield increase shortly after T-bond is issued, what is bond price, r=3.5% ?

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Forms of Bond Financing

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- Consol bond - is a bond that has no maturity and pays a fixed coupon.

$$PV = \frac{C}{r}$$

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Ex 2

- Lifecompany has issued cousol bonds with coupon payments of $50.If the required rate of return on these bonds at the time they were issued was 6%, at what price were they sold to the public? If the requied return today is 10%, at what price do the consols sell?

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Forms of Bond Financing

- ***Zero-coupon bond***
- *Zero coupon bonds are bonds that are issued at a discount to their redemption value, but no interest is paid on them*
- *Borrower: can be used to raise cash immediately, and there is no cash repayment until redemption date*
- *The price of the bond tends to be highly volatile in relation to the changes in interest rate*
- *Create the tax-shield with the difference between the initial bond price and the maturity value over the life of the bond*
- *The increase in the value of bonds is taxable annually even though the bondholders does not get any cash flow until maturity*

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Bond Pricing (Contd)

Giá trái phiếu

- Zero-coupon bond - bond has a coupon rate of 0.

$$PV = \frac{par}{(1+r)^t}$$

- Trái phiếu không có lãi suất - trái phiếu có lãi suất 0.

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Forms of Bond Financing

- ***Floating rate bond***
- *The interest rate is tied to the yield on T-bonds (~120% of the current T-bonds' yield)*
- *The floating rate bonds have broad limits that interest payments can not exceed*
- *The market value of the floating rate bond is either constant or almost constant*

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Forms of Bond Financing

- Convertible bonds
- **Convertible bonds** are bonds that give the holder the right to convert to other securities, normally ordinary shares, at a pre-determined price/rate and time
- Deep discount bonds
- **Deep discount bonds** are loan notes issued at a price which is at a large discount to the nominal value of the notes, and which will be redeemable at par (or above par) when they eventually mature.

II.Bond Prices, Yields, and Rating

- ***Bond Yields***

Coupon rate

Current yield

Yield to maturity

II.Bond Prices, Yields, and Rating

- **Coupon rate** $= \frac{\text{Stated interest payment}}{\text{Par value.}}$
- **Current Yield** $= \frac{\text{Stated interest payment}}{\textit{Current price of bond}}$
- **Yield to maturity** is the interest rate that will equate future interest payments and the payment at maturity (principal payment) to the current market price

Ex 1

A 6-year Circular File bond pays interest of $80 annually and sells for $950. What are its coupon rate?

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Ex2

A bond has 10 years units maturity, a coupon rate of 8%, and sells for $1,100. What is the current yield on the bond?

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II. Bond Prices, Yields, and Rating (cont'd)

❖ **Bond Yields** (cont'd)

– ***Yield to Maturity*** *– the interest rate that will equate future interest payments and the principal payment at maturity to the current market price*

$$\text{Appropriate YTM} = \frac{\text{Annual interest payment} + \frac{\text{Principal payment} - \text{Price of the bond}}{\text{Number of years to maturity}}}{0.6 \times \text{Price of the bond} + 0.4 \times \text{Principal payment}}$$

– *The bond with the par value of $1,000; the current price of the bond is $1050, the coupon rate is 10%. What is the YTM ?*

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II.Bond Yields (Contd)

Calculating Yield to Maturity (YTM=r)

If you are given the price of a bond (PV) and the coupon rate, the yield to maturity can be found by solving for r.

$$PV = \frac{cpn}{(1+r)^1} + \frac{cpn}{(1+r)^2} + \ldots + \frac{(cpn + par)}{(1+r)^t}$$

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II.Bond Prices, Yields, and Rating

Example: The bond with the par value of $1,000; the current price of the bond is $1050, the coupon rate is 10%. Maturity years are 5 yrs. What is the YTM ?

II.Bond Yields (Contd)

Example

What is the YTM of a 5.5 % annual coupon bond, with a $1,000 face value, which matures in 3 years? The market price of the bond is $1,056.03.

$$PV = \frac{55}{(1+r)^1} + \frac{55}{(1+r)^2} + \frac{1{,}055}{(1+r)^3}$$

$$PV = \$1{,}056.03$$

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II. Bond Prices, Yields, and Rating (cont'd)

❖ ***Bond Ratings***

- *Rating agencies: Moody's and S&P*
- *…providing ratings that describe the credit worthiness of corporate bonds*
- *The best rating in Moody's system: Aaa* → *…almost no chance of defaulting*

MOODY SYSTEM		S&P SYSTEM	
Aaa	Investment grade (*)	AAA	Investment grade
Aa(1,2,3)		AA (+,_,-)	
A (1,2,3)		A (+,_,-)	
Baa (1,2,3)		BBB (+,_,-)	
Ba (1,2,3)	Junk bond	BB (+,_,-)	Junk bond
B (1,2,3)		B (+,_,-)	
Caa (1,2,3)		CCC (+,_,-)	

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II. Bond Prices, Yields, and Rating (cont'd)

❖ ***Bond Ratings*** *(cont'd)*

– *The higher the rating assigned a given issue, the lower the required interest payments are to satisfy potential investors*

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II. Bond Prices, Yields, and Rating

❖ ***Methods of repayment***

Interest Rates and Bond Prices (the bond pays 12% interest)

Years to Maturity	Rate in the Market (%)—Yield to Maturity* 8%	10%	12%	14%	16%
1	$1,038.16	$1,018.54	$1,000	$981.48	$963.98
15	1,345.52	1,153.32	1,000	875.54	774.48
25	1,429.92	1,182.36	1,000	862.06	754.98

*The prices in the table are based on semiannual interest, but you enter the table with annual values.

– *Not only interest rates in the market but also years to maturity have a strong influence on bond prices*

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III. The Refunding Decision

Company

…witness …. Interest rates drops to 9.5%

…expect….the interest rate will not sink further and that it will move up

What should the firm do now ?

Now, the firm buys back the bonds at close to par, rather than at high market values

Then, the firm issues new debt at the current interest rate of 9.5%

Refunding operation

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III. The Refunding Decision (cont'd)

Should we make a refunding decision at the interest rate of 9.5% ?

	Old Issue	New Issue
Size	$10,000,000	$10,000,000
Interest rate	11.75%	9.5%
Total life	25 years	20 years
Remaining life	20 years	20 years
Call premium	10%	—
Underwriting costs	$125,000	$200,000
Tax bracket	35%	
Discount rate	6%	

– ***Call premium*** *– the premium to buy back the bond, the firm has to pay 10% above par*

– ***Discount rate*** *– aftertax cost of new debt: 9.5%(1-35%)*

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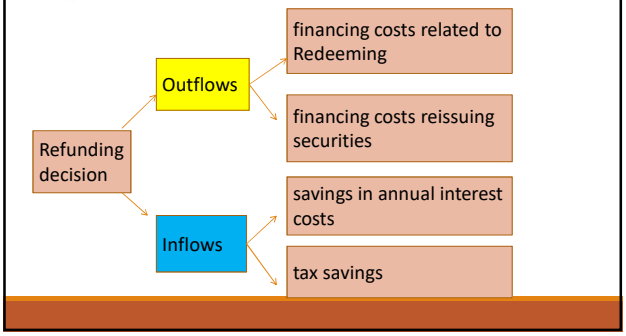
The Refunding Decision

Should we make a refunding decision at the interest rate of 9.5% ?



The Refunding Decision

Should we make a refunding decision at the interest rate of 9.5%

Total NPV of = cost saving in lower interest rate — *Total PV of Cash inflow* — *Total PV of cash outflow*

If NPV > 0: the firm should make decision

If NPV < 0: the firm should not

III. The Refunding Decision (cont'd)

- ***Step 1: Outflow considerations***

i. ***Payment of call premium***

– *Increase in cost means reducing the tax expense*

⇒ ***Net cost of call premium = $10,000,000 x 10% (1 – 35%) = $650,000***

ii. ***Underwriting cost on new issue:***

– *Each year tax saving caused by the underwriting costs:* ($200,000 / 20)*35% = $3,500

– *Total PV of the tax saving in 20 years:* $40,145

⇒ *Net cost of underwriting expense on the new issue:* $200,000 - $40,145 = $159,855

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III. The Refunding Decision (cont'd)

❖ **Step 2: Inflow considerations**

i. **Cost savings in lower interest rate:**

– Increase in cost saving means increasing the tax expense

– Each year, annual aftertax benefit:
[(11.75% - 9.5%)*$10,000,000](1-35%) = $146,250

⇒ Total PV of cost saving in lower interest rate: $1,677,488

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III. The Refunding Decision (cont'd)

❖ **Step 2: Inflow considerations** (cont'd)

ii. **Underwriting cost on old issue:**

– As calling the bond in now, we take the write-off below sooner:
($125,000 - $125,000 x 5 / 25) = $100,000

– As calling the bond in now, each year we loose the cost saving for tax:
($125,000 / 25) = $5,000

– The total PV of the cost saving (lost) in the remaining 20 years: = $57,350

– The net gain from the underwriting on the old issue: ($100,000 - $57,350) x 35%
= $14,928

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III. The Refunding Decision (cont'd)

❖ **Step 3: NPV**

⇒ Total NPV of cost saving in lower interest rate = Total Cash outflow – Total cash inflow

Total NPV = (1,677,144 + 14,928) + (650,000 + 159,855) = $882,561 >0

⇒ The firm should make refunding decision in case that the interest rate fall to 9.5%
During the next 20 years

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III.The Refunding Decision (cont'd)

Ex :Should we make a refunding decision at the interest rate of 9.5% ?

	Old Issue	New Issue
Size	$10,000,000	$10,000,000
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- ***Call premium*** *– the premium to buy back the bond, the firm has to pay 12% above par*
- ***Discount rate*** *– aftertax cost of new debt: 9.5%(1-35%)*

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Ex 2

- Dai hang Company. has a $10 million bond obligation outstanding which it is considering refunding. The bonds were issued at 10% and the interest rates on similar bonds have declined to 8%. The bonds have five years of their 15-year maturity remaining, underwriting costs of $200,000.
- The new bond will have a 5-year maturity. Company will pay a call premium of 6% and will incur new underwriting costs of $300,000 immediately.
- There is no underwriting cost consideration on the old bond. The company is in a 35% tax.
- To analyze the refunding decision, use a 10% discount rate.

Advantages and Disadvantages of Debt

Benefits of Debt

-Interest payments are tax-deductible

-The financial obligation is clearly specified (except the floating rate bonds)

-In an inflationary economy, debt may be paid back with "cheaper dollar"

-The use of debt may lower the cost of capital to the firm

Advantages and Disadvantages of Debt

- ***Drawbacks of Debt***
  - *Interest and principal payment obligations must be met regardless of the economic position of the firm*
  - *Must satisfy the demand of the bondholders for financial restrictions such as level of working capital, future debt…*
  - *Debt may depress outstanding common stock values*
- ***Eurobond Market***
  - ***Eurobond** – a bond payable in the borrower's currency but sold outside the borrower's country*

Leasing as Form of Debt

Current assets	$50	Current liabilities	$50
Fixed assets	150	Long-term liabilities	50
Leased Property under capital lease	100	Obligation under capital lease	100
		TOTAL LIABILITIES	**200**
		Stockholders'equity	100
TOTAL ASSETS	$300	TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	$300

The total-debt-to-total-assets will be…… 66.7%