Debt Financing

Debt Financing

- Debt instruments are also known as **fixed-income investments**
  - Contracts that promising to pay a future stream of cash to the investors who hold the contracts
- Difference between
  - Negotiable
    - A feature specified in the contract that permits its sale to another investor
  - Nonnegotiable
    - Which prohibits sale to another part
- Generally, the promised cash flows of a debt instrument are periodic payments, but the parties involves can negotiate almost any of sort cash flow.

Types of Bank Loans

- Although bank loans remain part of the total amount of debt that firms take on, the volume of bank financing has shrunk drastically since the 1960's when loans, along with bonds, made up about half of the corporate debt outstanding
- Major corporations with good credit rating have found that
  - Commercial papers
  - A short-term debt security
  - Nonbank loans from syndicates of wealthy private investors and institutions
    - Insurance companies
- Are less expensive than bank debt as a way to raise funds

Types of Bank Loans

- There are two general types of bank loans
- Lines of credit
  - An arrangement between a bank and a firm, typically for a short-term loan
  - The bank authorizes the maximum loan amount, but not the interest rate, when setting up the line of credit
- Loans commitments
  - An arrangement that requires a bank to lend up to a maximum loan amount at a prespecified interest rate at the firm's request as long as the firm meets the requirements established when the commitment was drawn up
  - There are two types of loan commitments
    - A revolver
      - In which funds flow back and forth between the bank and the firm without any predetermined schedule
    - A nonrevolving loan commitment
      - In which the firm may not pay down the loan (knowing as a takedown) and then subsequently increase the amount of borrowing

Floating rates

- Floating rates are interest rates that change over time
- Both lines of credit and loan commitments are floating-rate loans
  - Priced as a fixed spread over a prevailing benchmark rate
    - Which is the floating interest rate specified in the contract
    - Spread usually depends on the default risk of borrower

Commonly used benchmark rates

- Treasury rates
  - The yields e.g. on U.S. Treasury securities for various maturities ranging from 1 month to 30 years
    - Treasury bills
      - An zero-coupon Treasury issues with maturity form one month to one year
    - Treasury notes
      - Coupon-paying issues with maturities from 1 year to 10 years
    - Treasury bonds
      - Coupon-paying issues with maturities greater than 10 years

Commonly used benchmark rates

- Fed funds rate
  - Federal funds are overnight loans between two financial institutions
- LIBOR
  - The London interbank offered rate is a set of rates from different time deposits offered to major international banks by major banks in the Eurodollar market
- Commercial paper note
  - The yields on short-term, zero-coupon notes issued by major corporations
- Prime rate
  - This is a benchmark rate used by banks for some floating rate loans
  - Traditionally, the prime rate was charged by banks to their most credit-worthy customers

Creditworthiness and Spreads

- Spreads to these benchmark rates are quoted in terms of basis points
  - When 100 basis points equals 1 percent
  - E.g. the spread of a borrower with almost no default risk might be LIBOR plus 20 basis points
    - LIBOR = 8 percentage per year and the borrower pays 8.2 percentage per year
- Creditworthiness of the borrower determines the spread over the benchmark rate
- Highly leveraged companies with substantial default risk may end up borrowing at a rate between 150 basis points and 400 basis points above LIBOR

Caps, Floors, and Collars

- Floating-rate agreements often have
  - A cap
    - Maximum interest rate
  - A floor
    - Minimum interest rate
- E.g. if a loan has a spread of 50 basis points to LIBOR is at 7 percentage but the cap is set at 7.25 percent, the interest rate changed on the loan over the period will be the cap interest rate, 7.25 percent instead of the benchmark rate plus spread, which . would be 7.5 percent
- A **collared floating-rate** loan has both a cap and a floor on the interest rate

Leases

- A lease can be viewed as a debt instrument witch the owner of an asset, **the lessor**, gives the right to use the asset to another party, **the lessee**, in return for a set of fixed payments.
- There are two basic types of leases
  - Operating leases
  - Financial leases

Commercial Paper

- The most commonly used short-term source of financing for corporations
- Commercial Paper
  - A contract by which a borrower promises to pay a prespecified amount to the lender of the commercial paper at some date in the future
    - The prespecified amount is generally paid off by issuing new commercial paper
    - On rare occasions, the borrower will not choose this rollover, perhaps because short-term interest rates are too high
      - In this case, the company pays off the commercial paper debt with a line of credit form a bank
  - This **bank backing**, along with the high quality of the issuer and **short term nature** of the instrument, make commercial paper **risk free**
    - **Penn Central default in 1970**

Buyback Provision

- Most commercial paper can be sold to another investors, although this rarely occurs because the costs of such transaction are high
- A consequence of this lack of secondary market activity is that all issuers of commercial paper stand ready to buy back their commercial paper prior to maturity, often with little or no penalty
  - Approx. less than 1 percent of commercial paper is redeemed prematurely

Corporate Bonds

- Bonds are tradable fixed-income securities with several specific features
  - Bond covenants (bond indentures)
    - The rules that specify rights of lender and the restrictions of the borrower
  - Options
    - The feature that allow both buyers and sellers to terminate the bond agreement
  - Cash flow pattern
    - Specified by the annual interest payments, or coupon
      - Fixed-rate bonds typically pay half the stated coupon every six months.
        - The coupon rate, which is the coupon stated as a percentage of the bond's face value, determines the coupon. E.g. 8 percentage coupon typically means two 4 USD payments per 100 USD of face value per year
      - Floating-rate bonds where the interest rates are typically some benchmark rate plus a fixed or variable spread

Corporate Bonds

- Maturity
  - The maximum length of time the borrower has to pay off the bond principal in full. Maturities on corporate bonds are generally less than 30 years, but it is possible to sell bonds with longer maturity.
    - In 1996 IBM issued 100-year bonds, 1993 Coca-cola issued 100-year bond
      - In spite of these unusual cases, the average maturity of bonds has been falling in the last 25 years and is now less than 10 years – probably because of interest rates volatility
- Price
  - The amount at which is bond sells, particularly in relation to principal owed
- Bond rating
  - The creditworthiness of a bond

Junk Bonds

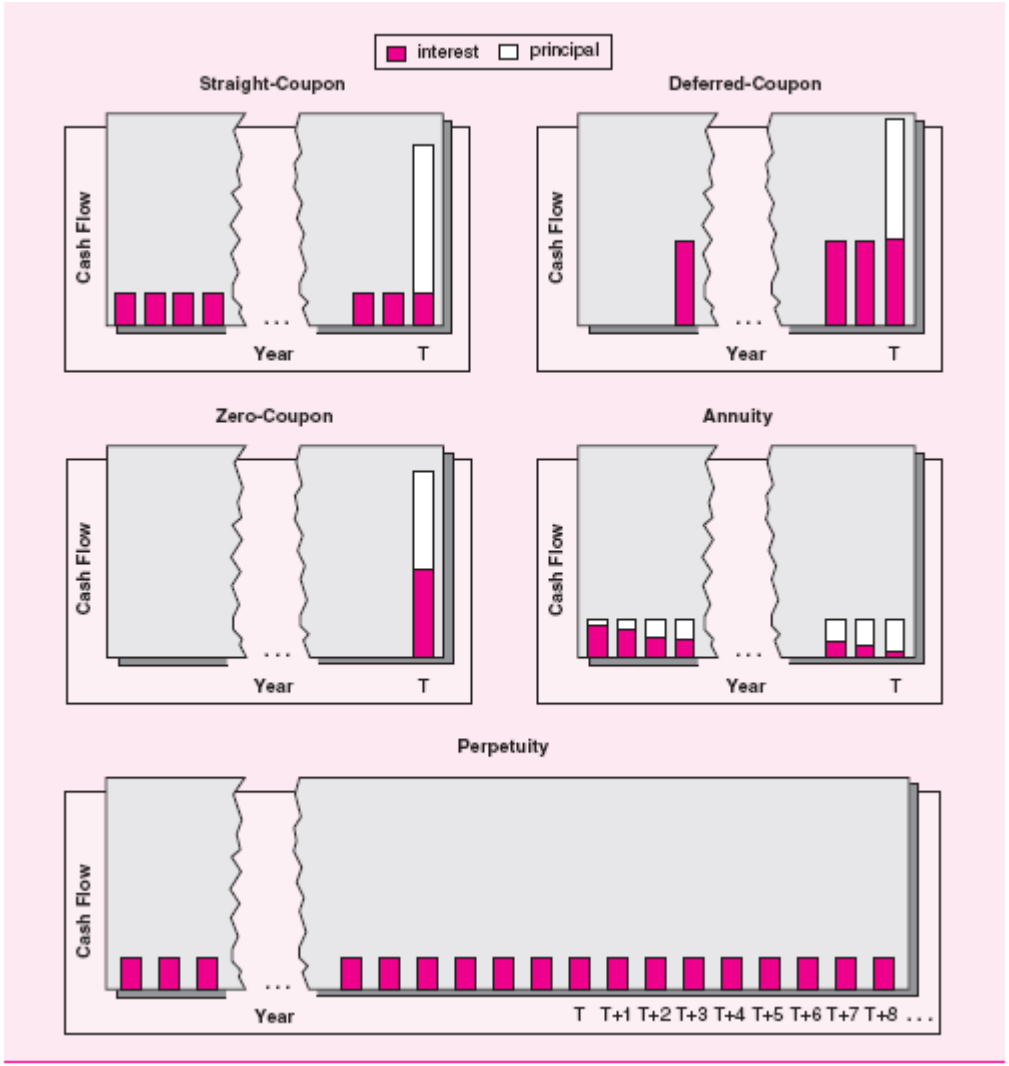
- Speculative bonds with rating below Moody's Baa or Standard and Poor's BBB rating
  - Before the late 19070's primary issues of speculative-grade securities were very rare
  - In 1977 investment banks recognized that there were many investors who would be willing to take on greater risk if they were compensated with greater return
- Two problems
  - Poor liquidity – establishing of market makers for junk bonds. Important feature for investors who seldom want to hold the bonds to maturity
  - Very real chance that the issuing firms would default on their bond payments
- Michael Milkem and banking firm of Drexel Burnham Lambert
  - A fee 2 – 3 % of each junk bond issue
  - Drexel Burnham Lambert most profitable firm in the Wall Street in 1987
  - Milken's personal income between 1983 and 1987 was in excess of 1 billion USD
    - Insider trading
    - Drexer company was not able to support the junk bond market
      - 250 companies defaulted between 1989-1991
      - Drexel filed bankruptcy in 1990
      - Milken was sentenced to three years in prison

Cash flow Pattern

- Bond types are often categorized by their cash flow pattern
  - Straight-coupon bond
    - Fixed-rate instrument in which the coupon is typically paid in two equal semiannual installments only last installment including principal repayment
  - Zero-coupon bond (Pure discount bonds)
    - Bonds that pay no periodic interest but have a single payment at maturity
    - This bonds are sell with a discount from their face value

Cash flow Pattern

- Deferred-coupon bond
  - Bonds that permit the issuer to avoid interest payment obligations for a certain period
- Perpetuity bond (called a consol)
  - Bonds that last forever and only pay interest
- Annuity bond
  - Bonds that pay a mix of interest and principal for a finite amount of time


interest
principal
Straight-Coupon
Deferred-Coupon
Zero-Coupon
Annuity
Perpetuity
Cash Flow
Year
T
T+1 T+2 T+3 T+4 T+5 T+6 T+7 T+8 . . .

Coupon Bond

Bond Prices: Par, Discount, and Premium Bonds

- Bonds are also categorized by their market price in relation to the amount of principal due
- Premium bond
  - Bond with a quoted price that exceeds the face value of the bond
- Par bond
  - Bond with a quoted price that equals the face value of the bond
- Discount bond
  - Bond with a face value that exceeds the quoted price of the bond

Bond rating

Moody's	*S&P*	*Fitch*	*Brief Definition*
Investment Grade–High Creditworthiness			
Aaa	AAA	AAA	Gilt edge, prime, maximum safety
Aa1	AA+	AA+	Very high grade, high quality
Aa2	AA	AA	
Aa3	AA−	AA−	
A1	A+	A+	Upper medium grade
A2	A	A	
A3	A−	A−	
Baa1	BBB+	BBB+	Lower medium grade
Baa2	BBB	BBB	
Baa3	BBB−	BBB−	
Distinctly Speculative–Low Creditworthiness			
Ba1	BB+	BB+	Low grade, speculative
Ba2	BB	BB	
Ba3	BB−	BB−	
B1	B+	B+	Highly speculative
B2	B	B	
B3	B+	B+	
Predominantly Speculative–Substantial Risk or in Default			
	CCC+		
Caa	CCC	CCC	Substantial risk, in poor standing
	CCC−		
Ca	CC	CC	May be in default, extremely speculative
C	C	C	Even more speculative than those above
	CI		Income bonds—no interest being paid
		DDD	Default
		DD	
	D	D	

Bond rating

- Bond ratings can have an important influence on the promised rates of return of corporate bonds
  - Bond yields
- During 1983 the spread between AAA rated bonds and BBB rated bonds varied between 180 and 246 basis points, which was unusually large
- In 1993 it was between 75 and 90 basis points
  - Widened again in the latter part of 1998
    - Default of Russia
- The bond of a firm with high rating would sell at a higher price than the bond of a firm with a lower rating if two firms have similar rations and their bonds have the same features
  - Similar seniority, coupon, etc.

Macroeconomic Conditions and Financial Innovation

- Conditions that influence the macroeconomy, such as oil prices or inflation, lead to innovation debt securities
  - E.g. during 1989 Kuwaiti crisis crude oil prices reached about 40 USD per dollar but long-term oil prices represented by prices in the forward market, were far lower
    - Investment banks issued oil-linked bonds
    - These bond were characterized by lower than normal coupon rates, allowing the corporate issuer to save on interest payments
    - To compensate investors for the low coupon rate, the principal to be paid was either four times the per-barrel price of crude oil at the maturity of the bond or 100 USD, whichever was larger
  - Treasury Inflation Protected Securities (TIPS)
    - First begun in 1997, these Treasury notes and bonds pay a lower coupon rate then normal Treasury securities, again saving the issuer a sizable sum in the short run
    - To compensate investors for the lower coupon, the principal on which the coupon is paid grows each year – by the rate of inflation as measured by the urban consumer price index

Yield to Maturity

- Yield to Maturity
  - The interest rate that equates the present value of cash flows received from a debt instrument with its value today
- Coupon bonds
  - Because coupon bonds have more then one cash flow payment, the present value of the bond is calculated as the sum of the present values of all coupon payments plus the present value of the final payment of the face value of the bond

Yield to Maturity

- Example
  - The present value of a 1.000 USD face value bond with n years to maturity and yearly coupon payments of 100 USD can be calculated as follows:
    - At the end of one year, there is a 100 USD coupon payment with a PV of 100(1+i)
    - At the end of two years, there is another 100 USD coupon payment with PV of 100(1+i)^2
    - An so on until at maturity, there will be last coupon payment with a PV of 100(1+i)^n and repayment of the face value thus, 1000(1+i)^n

Yield to Maturity

- The price of coupon bond is equal to the sum of the present values of all cash flows for this bond
  - Coupon payment
  - The face value
  - The years to maturity and
  - Price of the bond are known quantities
- Yield to maturity is set as
  - PV=CF/(1+i)^n

Yield to Maturity

- Discount Bond
  - The yield to maturity for a discount bond is similar to that for the simple loan

Negative T-Bill rates - Japan

- We normally assume that interest rates must always be positive
  - Negative interest rates would imply that you are willing to pay more for a bond today than you will receive for it in the future
  - Negative interest rates therefore seem like an impossibility because you would do better by holding cash hat has the same value in the future as it does today
  - In November 1998, interest rates on Japanese six-month Treasury bills became negative, with interest rate -0.004 % when investors paid more for the bills that their face value
  - Investors find it more convenient to hold these six-month bills as a store of value rather than holding cash because the bills are denominated in large amounts and can be store electronically

Current Yield Calculation

- Current yield
  - It is defined as the yearly coupon payment divided by the price of the security
    - Current yield = yearly coupon payment/price of the coupon bond
  - Current yield is negatively related to the price of the bond
    - In the case of our 10% coupon rate bond, when the price rises from 1.000 to 1.100, the current yield falls from 10 % (100/1000) to 9.09 % (100/1100)

Finding the Value of Coupon Bonds

- Sum up how to find the value of a security
  - Identify the cash flows that result from owning the security
  - Determine the discount rate required to compensate the investor for holding the security
  - Find the present value of the cash flows estimated in step 1 using the discount rate determined in step 2

Bond Terminology

- Coupon interest rate
  - The stated annual interest rate on the bond. It is usually fixed for the life of the bond
- Current yield
  - The coupon interest payment divided by the current market price of the bond
- Face amount
  - The maturity value of the bond. The holder of the bond will receive the face amount from the issuer when the bond matures
- Maturity
  - The number of years or periods until the bond matures and the holder is paid the face amount
- Par value
  - The same as the face amount
- Yield to maturity
  - The yield that investor will earn if the bond is purchases at the current market price and held until maturity

Investing in Bonds

- Bonds represent on of the most popular long-term alternatives to investing in stocks
- Bonds are lower risk than stocks because they have a higher priority of payment
  - Bondholders get paid before stockholders
- Many investors think that bonds represent a very low risk investment since the cash flows are relative certain
- It is true that high-grade bonds seldom default but
  - Bond investors face fluctuations in price due to market interest-rate movements in the economy
    - As interest rates rise or fall the value of bonds change in the opposite directions
      - Possibility of suffering a loss because of interest rate changes is called **interest rate risk**

Investing in Bonds

- The longer the time until the bond maturity of the bond the greater will be the change in price
  - This does not cause a loss to investors who do not sell their bonds
    - But many investors do not hold their bonds until maturity
    - If they attempt to sell their bonds after interest rates have risen, they will receive less than they paid
    - Interest-rate risk is an important consideration when deciding whether to invest in bonds

Thank you for your attention