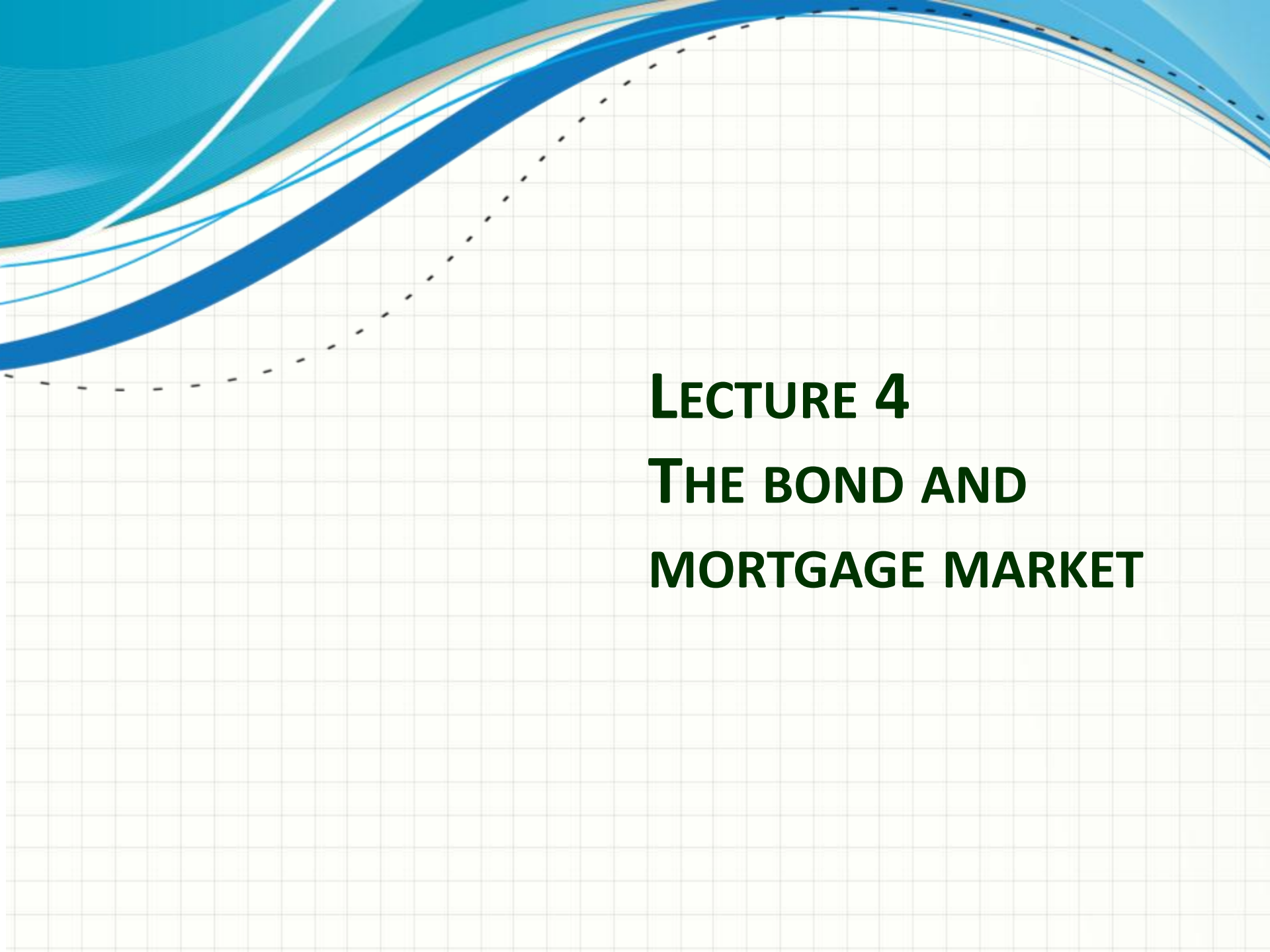




LECTURE 4

THE BOND AND MORTGAGE MARKET

Lecture 4

- Chapter 12 & 14 of textbook by Frederic S. Mishkin and Stanley Eakins, Financial Markets and Institutions, Global Edition, 7th edition, Pearson

Key Terms

- Bonds
- Bond Issuance
- Bonds vs. Stocks
- Bond Types
- Mortgages
- Securitisation

Bonds

- Bond is an instrument of indebtedness of the bond issuer to the holder
- A debt security, where the issuer owes the holder a debt and, depending on the terms of the bond, is obliged to pay interest and/or repay principal at a later date (maturity)
- The lender (creditor) is the holder of the bond
- The borrower (debtor) is the issuer of the bond
- Interest is usually payable at fixed intervals (semi-annual, annual, sometimes monthly)
- Bonds provide the borrower with external funds to finance long-term investments, or, in the case of government bonds, to finance current expenditure

Bond Issuance

- Bonds are issued by public authorities, credit institutions, companies & supranational institutions in the primary market
- Most common process for issuing bonds is through "underwriting" where, one or more securities firms or banks, forming a syndicate, buy the entire issue of bonds from the issuer and re-sell them to investors
- The security firm takes the risk of being unable to sell on the issue to end investors
- Primary issuance is arranged by book-runners who:
 - arrange the bond issue,
 - have direct contact with investors and
 - act as advisers to the bond issuer in terms of timing & price of the bond issue

Bond Issuance

- The book-runner willingness to underwrite must be discussed prior to any decision on the terms of the bond issue as there may be limited demand for the bonds
- In the case of an underwritten bond, the underwriters will charge a fee for underwriting
- For smaller issues a private bond placement is common
- An alternative process for bond issuance is on a “best efforts basis” , where no underwriting takes place and the volume and price is determined by demand

Bond Issuance

- Government bonds are usually issued in an auction. In some cases both members of the public & banks may bid for bonds. In other cases only market makers may bid for bonds
- An alternative practice of issuance is to issue bonds over a period of time, usually at a fixed price, with volumes sold on a particular day dependent on market conditions. This is called a tap issue or bond tap

Bonds vs. Stocks

- Bonds & stocks are both securities, but the major differences between the two are:
- Stockholders have an equity stake in the company (i.e. they are owners), whereas bondholders have a creditor stake in the company (i.e. they are lenders)
- In the event of bankruptcy, being a creditor, bondholders have absolute priority & will be repaid before stockholders (who are owners)
- Bonds usually have a defined term, or maturity, after which the bond is redeemed, whereas stocks are typically outstanding indefinitely
- An exception is an irredeemable bond, such as Consols, which is a perpetuity, i.e. a bond with no maturity

Bond Types

- The following are not mutually exclusive, **and more than one of them may apply to a bond**
- Fixed rate bonds have a coupon that remains constant throughout the life of the bond. A variation are stepped-coupon bonds, whose coupon increases during the life of the bond
- Floating rate notes (FRNs, floaters) have a variable coupon that is linked to a reference rate of interest, such as LIBOR or Euribor
- Zero-coupon bonds (zeros) pay no regular interest. They are issued at a substantial discount to par value, so that the interest is effectively rolled up to maturity
- Zero-coupon bonds may be created from fixed rate bonds by a financial institution separating ("stripping off") the coupons from the principal. In other words, the separated coupons & the final principal payment of the bond may be traded separately

Bond Types

- High-yield bonds (junk bonds) are bonds that are rated below investment grade by the credit rating agencies. As these bonds are more risky than investment grade bonds, investors expect to earn a higher yield
- Convertible bonds lets a bondholder exchange a bond to a number of shares of the issuer's common stock
- Exchangeable bonds allows for exchange to shares of a corporation other than the issuer

Bond Types

- **Inflation-indexed bonds** (linkers) (US) or Index-linked bond (UK), in which the principal amount & interest payments are indexed to inflation
- The interest rate is normally lower than for fixed rate bonds with a comparable maturity. As the principal amount grows, the payments increase with inflation
- UK first issued inflation linked gilts in the 1980s. Treasury Inflation-Protected Securities (TIPS) and I-bonds are examples of inflation linked bonds issued by the U.S. government

Bond Types

- Asset-backed securities (ABS) are bonds whose interest & principal payments are backed by underlying cash flows from other assets
- Subordinated bonds are those that have a lower priority than other bonds of the issuer in case of liquidation
- In case of bankruptcy, there is a hierarchy of creditors.
- First the liquidator is paid, then government taxes, etc. The first bond holders in line to be paid are those holding what is called senior bonds. After they have been paid, the subordinated bond holders are paid.
- Subordinated bonds have more risk and lower credit rating than senior bonds. ABS are often issued in tranches. The senior tranches get paid back first, the subordinated tranches later

Bond Types

- Covered bond are backed by cash flows from mortgages or public sector assets. Contrary to ABS the assets for such bonds remain on the issuers balance sheet
- Perpetual bonds are also often called perpetuities or 'Perps'. They have no maturity date
- Bearer bond is an official certificate issued without a named holder. In other words, the person who has the paper certificate can claim the value of the bond. Often they are registered by a number to prevent counterfeiting
- Municipal bond is a bond issued by a state, U.S. Territory, city, local government, or their agencies

Treasury Notes & Bonds

- U.S. Treasury issues notes & bonds to finance its operations
- Table below summarizes the maturity of various Treasury securities

Type	Maturity
Treasury bill	Less than 1 year
Treasury note	1 to 10 years
Treasury bond	10 to 30 years

Treasury Bond Interest Rates

- No default risk since the Treasury can print money to payoff the debt
- Very low interest rates, often considered the risk-free rate (although inflation risk still exists)

Treasury Bonds

- Treasury Inflation-Indexed Securities:
 - the principal amount is tied to the current rate of inflation to protect investor purchasing power
- Treasury STRIPS:
 - coupon & principal payments are “stripped” from a T-Bond and sold as individual zero-coupon bonds

Treasury Bonds: Agency Debt

- Technically not Treasury securities, agency bonds are issued by government-sponsored entities, such as GNMA, FNMA, and FHLMC.
- The debt has an “implicit” guarantee that the U.S. government will not let the debt default. This “guarantee” was clear during the 2008 bailout...

Municipal Bonds

- Municipal bond is a bond issued by a state, U.S. Territory, city, local government, or their agencies
- Interest income received by holders of municipal bonds is often exempt from the federal income tax and from the income tax of the state in which they are issued
- Tax-free municipal interest rate = taxable interest rate $\times$ (1 – marginal tax rate)

Municipal Bonds: Example

Suppose the rate on a corporate bond is 9% and the rate on a municipal bond is 6.75%. Which should you choose?

Answer: Find the marginal tax rate:

$$6.75\% = 9\% \times (1 - \text{MTR}), \text{ or } \text{MTR} = 25\%$$

If you are in a marginal tax rate above 25%, the municipal bond offers a higher after-tax cash flow

Municipal Bonds: Example

Suppose the rate on a corporate bond is 9% and the rate on a municipal bond is 6.75%. Which should you choose? Your marginal tax rate is 28%

OR Answer: Find the equivalent tax-free rate:

$$\text{ETFR} = 9\% \times (1 - \text{MTR}) = 9\% \times (1 - 0.28)$$

The ETFR = 6.48%. If the actual muni-rate is above this (it is), choose the muni

Municipal Bonds

- Two types
 - General obligation bonds
 - Revenue bonds
- NOT default-free (e.g., Orange County California)
 - Defaults in 1990 amounted to \$1.4 billion in this market

Corporate Bonds

- Typically have a face value of \$1,000, although some have a face value of \$5,000 or \$10,000
- Pay interest semi-annually

Corporate Bonds

- Cannot be redeemed anytime the issuer wishes, unless a specific clause states this (call option)
- Degree of risk varies with each bond, even from the same issuer. Following suite, the required interest rate varies with level of risk
- The degree of risk ranges from low-risk (AAA) to higher risk. Any bonds rated below BBB are considered sub-investment grade debt

Junk Bonds

- Junk Bonds
 - Debt that is rated below BBB
 - Often, trusts and insurance companies are not permitted to invest in junk debt
 - Michael Milken developed this market in the mid-1980s, although he was subsequently convicted of insider trading

Debt Ratings

Standard and Poor's	Moody's	Average Default Rate (%)*	Definition
AAA	Aaa	0.00	Best quality and highest rating. Capacity to pay interest and repay principal is extremely strong. Smallest degree of investment risk.
AA	Aa	0.02	High quality. Very strong capacity to pay interest and repay principal and differs from AAA/Aaa in a small degree.
A	A	0.10	Strong capacity to pay interest and repay principal. Possess many favorable investment attributes and are considered upper-medium-grade obligations. Somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions.
BBB	Baa	0.15	Medium-grade obligations. Neither highly protected nor poorly secured. Adequate capacity to pay interest and repay principal. May lack long-term reliability and protective elements to secure interest and principal payments.
BB	Ba	1.21	Moderate ability to pay interest and repay principal. Have speculative elements and future cannot be considered well assured. Adverse business, economic, and financial conditions could lead to inability to meet financial obligations.
B	B	6.53	Lack characteristics of desirable investment. Assurance of interest and principal payments over long period of time may be small. Adverse conditions likely to impair ability to meet financial obligations.

Debt Ratings

CCC	Caa	24.73	Poor standing. Identifiable vulnerability to default and dependent on favorable business, economic, and financial conditions to meet timely payment of interest and repayment of principal.
CC	Ca	24.73	Represent obligations that are speculative to a high degree. Issues often default and have other marked shortcomings.
C	C	24.73	Lowest-rated class of bonds. Have extremely poor prospects of attaining any real investment standard. May be used to cover a situation where bankruptcy petition has been filed, but debt service payments are continued.
CI			Reserved for income bonds on which no interest is being paid.
D			Payment default.
NR			No public rating has been requested.
(+) or (-)			Ratings from AA to CCC may be modified by the addition of a plus or minus sign to show relative standing within the major rating categories.
*Average default rates are for data Moody's computed for defaults within one year of having given the rating for the period 1970-2001. Source: Federal Reserve Bulletin.			

Financial Guarantees for Bonds

- Some debt issuers purchase *financial guarantees* to lower the risk of their debt
- The guarantee provides for timely payment of interest and principal, and are usually backed by large insurance companies

Bond Current Yield Calculation

What is the current yield for a bond with a face value of \$1,000, a current price of \$921.01, and a coupon rate of 10.95%?

Answer:

$$i_c = C / P = \$109.50 / \$921.01 = 11.89\%$$

Note: C (coupon) = $10.95\% \times \$1,000 = \$109.50$

Investing in Bonds

- Bonds are the most popular alternative to stocks for long-term investing
- Even though the bonds of a corporation are less risky than its equity, investors still have risk: price risk & interest rate risk

Mortgages

- Loans made to purchase property, and usually collateralized by it
- Characteristics of Residential Mortgages: includes the length of the mortgage, the terms & the rate for the loan

Mortgages

- Loan Servicing: the fees generated by collecting, distributing, and recording payments
- Secondary Mortgage Market: the active market for mortgages after the mortgage has been originated

Securitisation

- “Securitise”: “turn into a security”
- Securitization is the process of converting cash flows arising from underlying assets or debts (receivables), such as residential, commercial mortgages, auto loans, credit card debt obligations etc., due to the originator into a smoothed repayment stream, thus enabling the originator to raise finance through the issue of securities
- The portfolio of assets is "pooled" and transferred to a Special Purpose Vehicle (SPV): the issuer, a tax-exempt company or trust formed for the specific purpose of funding the assets
- In order to buy the assets from the originator, the issuer SPV issues securities to fund the purchase
- Investors purchase the securities, either through a private offering or on the open market

Securitisation

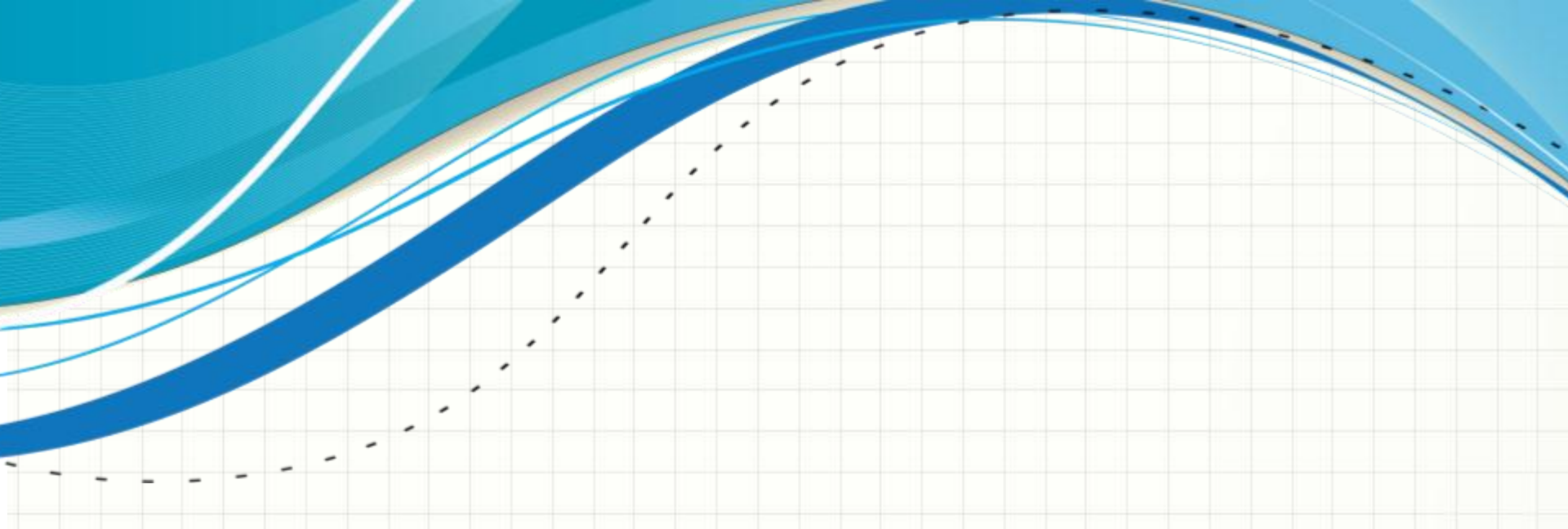
- Once the assets are transferred to the issuer, there is normally no recourse to the originator (initial owner of the assets)
- The issuer is "bankruptcy remote," meaning that if the originator goes into bankruptcy, the issuer's assets will not be distributed to the originator's creditors
- In order to achieve this, the governing documents of the issuer restrict its activities to only those necessary to complete the issuance of securities
- The performance of the securities is directly linked to the performance of the assets
- Credit rating agencies rate the securities that are issued and provide an external perspective

Securitisation

- Major Sectors
- RMBS: Residential Mortgage Backed Securities (backed by home loans)
- ABS: Asset Backed Securities (backed by consumer, commercial financial, operating assets)
- CMBS: Commercial Mortgage Backed Securities (backed by commercial real estate)
- CDOs: Collateralised Debt Obligations (backed by CDS (credit default swaps) or corporate obligations such as leverage loans, high yield bonds, ABS/RMBS/CMBS/CDOs)

Securitisation

- Securitisation motivation:
 - Remove originator risk from assets/pool of assets
 - Free up originator's balance sheet
 - Cheaper source of funds (i.e., Aaa rated cost of funds to lower rated companies)
 - Investor appeal
 - Attractive yield (typically in excess of similar rated corporates)
 - Access to assets not normally available
 - Diversification of risk
 - Package credit risk to meet investor appetite
 - Tranching (e.g., from Aaa to Ba), lower to higher credit risk investments
 - Swapping cash flows (\$ to €, fixed to floating)



QUESTIONS