

CFA Pre-Courses

Fixed Income

First Insight to Fixed Income

Why fixed-income securities in Finance?



巴菲特

融资是门技术，投资是门艺术！

不明真相的群众

哎呦妈呀~太高深了~能整点听得懂的么???



马云

用好别人的钱，用好明天的钱！

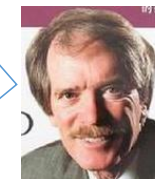
不明真相的群众

马老板~已经跟不上您的节奏啦！



债券之王：比尔·格罗斯

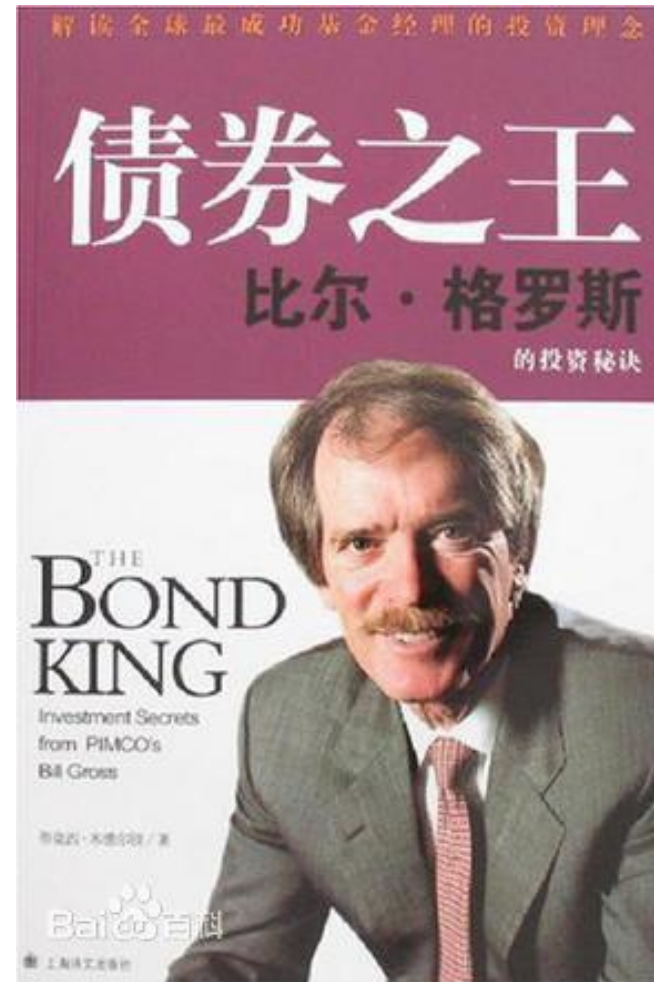
那就跟着我太平洋投资管理公司（PIMCO）的总回报债券基金吧~~~哈哈~~~



First Insight to Fixed Income

债权之王：比尔·格罗斯

- 全球最为著名、业绩最佳的基金经理。在投资领域，人们把他与沃伦·巴菲特相提并论；
- 格罗斯管理超过**3500亿美元**的基金资产。他的一句话会引起14万亿美元的债券市场的震动。



First Insight to Fixed Income

Fixed Income in CFA

➤ Topics in CFA curriculum:

Ethics & Professional Standards	
Investment Tools	Quantitative Methods (QM)
	Economics
	Financial Reporting & Analysis
	Corporate Finance
Asset Classes	Equity Investment
	Fixed Income
	Derivatives
	Alternative Investments
Portfolio Management & Wealth Planning	

Recommendation for Fixed Income

Fixed Income Securities

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- 出版社: [机械工业出版社](#)
- 出版时间: 2014年1月
- 作者塔克曼和塞拉特把近些年国际顶尖金融学者与业界专家发展出的一些复杂理论和工具简单、有效地展现给广大投资者、交易员和其他金融专业人员, 不论是资深从业者还是新入门读者都将会发现, 本书汇集了解决今天金融市场问题的理论、方法, 具有无可估量的价值!



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04 Introduction to ABS



Fixed Income Securities

Fixed-income security (固定收益证券):

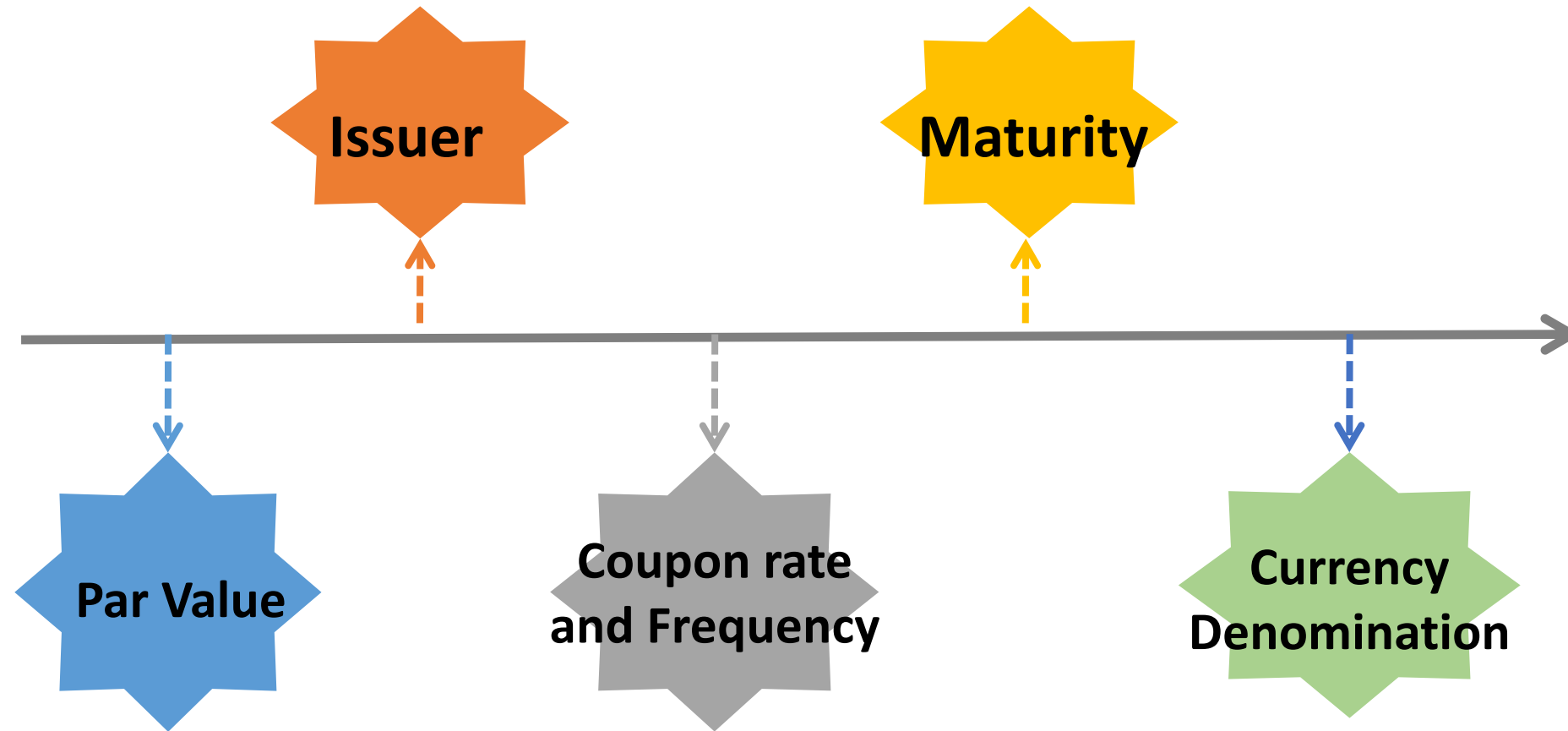
- An instrument that allows **governments, companies**, and **other types of issuers** to borrow money from investors.



Fixed Income Securities

➤ Basic features of The Bond

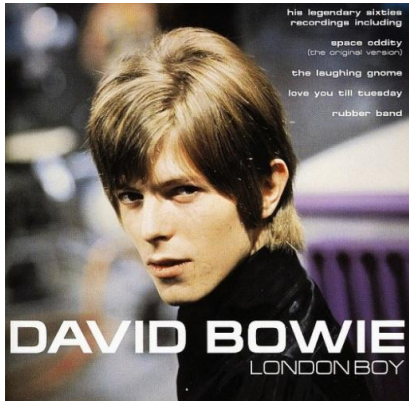
A bond is a contractual agreement between the issuer and the bondholders to borrow or lend money.



Fixed Income Securities

➤ Issuer (发行者)

- ✓ A legal entity that develops, registers and sells securities for the **purpose of financing** its operations.



Private Individuals

E.g. *Musician David Bowie*



National Governments

E.g. *China or Italy*



Company

E.g. *BP, General Electric,
or Alibaba*



Fixed Income Securities

➤ Maturity/Maturity Date (到期日)

- ✓ The date when the issuer is obligated to redeem the bond by paying the outstanding principal amount.

➤ Tenor (到期时间)

- ✓ The time remaining until the bond's maturity date

**Money
Market
Securities**

Maturities at
issuance is **one
year or less**

**Capital
Market
Securities**

Original maturities
that are **longer
than one year**

**Perpetual
Bonds**

No state maturity date.
E.g. *sovereign
government in the
United Kingdom*



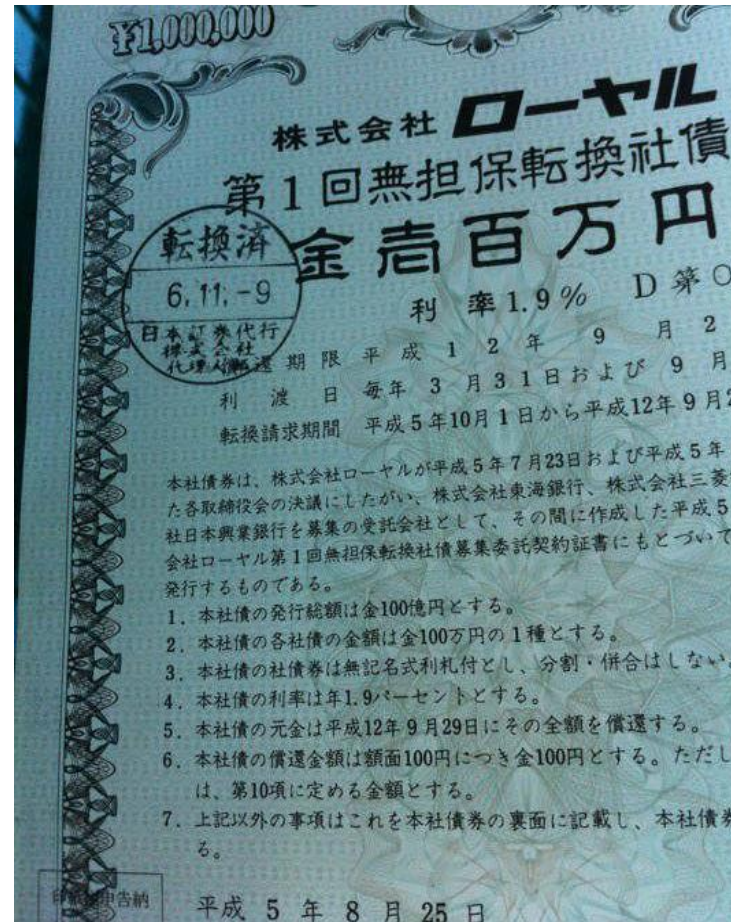
Fixed Income Securities

- Par value/face value/principal amount (面值)
 - ✓ The amount that the issuer agrees to repay the bondholders **on the maturity date**.



Fixed Income Securities

➤ Coupon (票息)



Fixed Income Securities

➤ Coupon rate (票息率)

- ✓ The coupon rate or nominal rate of a bond is the interest rate that the issuer agrees to pay each year until the maturity date.

- ✓ $\text{Coupon} = \text{Coupon rate} \times \text{Principal}$

➤ Coupon Frequency (付息频率)

- ✓ The times of coupon payment each year.
- ✓ **ATTENTION!!** 若题目没有明确说明，则默认债券为每半年付息

Fixed Income Securities

➤ Currency Denominator

- ✓ The currency that the bond is issued in.
- ✓ If the currency is not **liquid** or **freely traded**, or if the currency is very volatile **relative** to major currencies, investments in the currency will not appeal to many investors.

➤ Dual-currency bonds (双货币债券)

- ✓ Makes coupon payments in **one currency** and pay the par value at maturity in **another currency**

Practice Question

A 10-year bond was issued four years ago. The bond is denominated in US dollars, offers a coupon rate of 10% with interest paid semi-annually, and is currently priced at 102% of par. The bond's:

- A. Tenor is six years.
- B. Nominal rate is 5%.
- C. Face value is 102% of the par .



Practice Question

Answer:

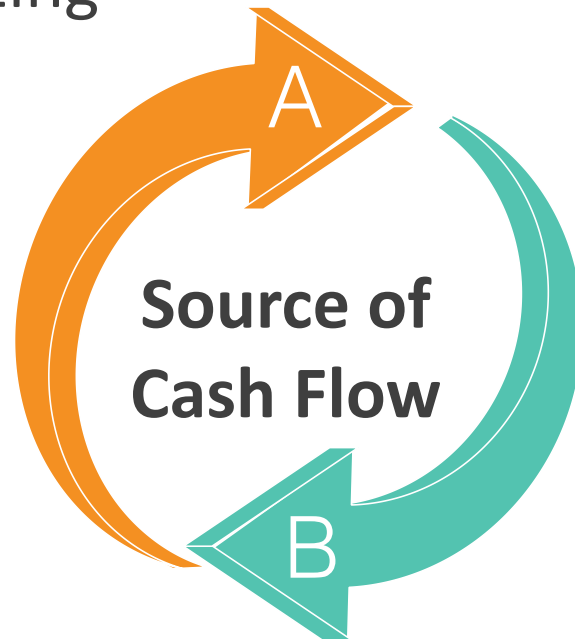
A is correct. The tenor of the bond is the time remaining until the bond's maturity date. Although the bond had a maturity of 10 years at issuance (original maturity), it was issued four years ago. Thus, there are six years remaining until the maturity date.



Cash Flow Structure

A Principal

- ◆ Bullet
- ◆ Amortizing



B Coupon

- ◆ Fixed Rate
- ◆ Float Rate



Principal Repayment Structure

Bullet Bonds(子弹型债券)

The entire payment of principal occurs at maturity

- A *plain vanilla* bond
- Most government bonds are used in this style

Question: A 3-year government bond has a par value of \$1000 with 5% coupon paid annually. What is the cash flow for the bullet bonds?

Answer:

$C = 5\%$



Principal Repayment Structure

Amortizing bonds (摊销债券)

- Has a periodic repayment schedule of principal.
 - ✓ **Fully amortized bond (完全摊销)**: has a schedule that reduces outstanding principal to zero by the maturity date.
 - ✓ **Partially amortized bond (部分摊销)** : only a portion of the principal is repaid by the maturity date.
 - **Balloon payment**: amount required at maturity to retire the bond's outstanding principal.

Principal Repayment Structure

Fully Amortized Bond

- 某人选择等额本息的方式进行商业贷款10万，期限4年，贷款利率为5%。

Year	Cash Flow	Interest Payment	Principal repayment	Outstanding principal
0	-100,000			
1	28201.18	5000	23201.18	76798.82
2	28201.18	3839.94	24361.24	52437.58
3	28201.18	2621.88	25579.30	26858.28
4	28201.18	1342.91	26858.28	0

Principal Repayment Structure

Partially Amortized Bond

- 某商业不动产贷款10万元，期限4年，贷款利率为5%，
最后一年支付本金1万元，其余本金进行摊销。

Year	Cash Flow	Interest Payment	Principal repayment	Outstanding principal
0	-100,000			
1	25881.06	5000	20881.06	79118.94
2	25881.06	3955.95	21925.11	57193.83
3	25881.06	2859.69	23021.37	34172.46
4	35881.06	1708.62	34172.46	0

Practice Question

The Structure that requires the largest repayment of principal at maturity is that of a:

- A. Bullet Bond
- B. Fully Amortized Bond
- C. Partially Amortized Bond

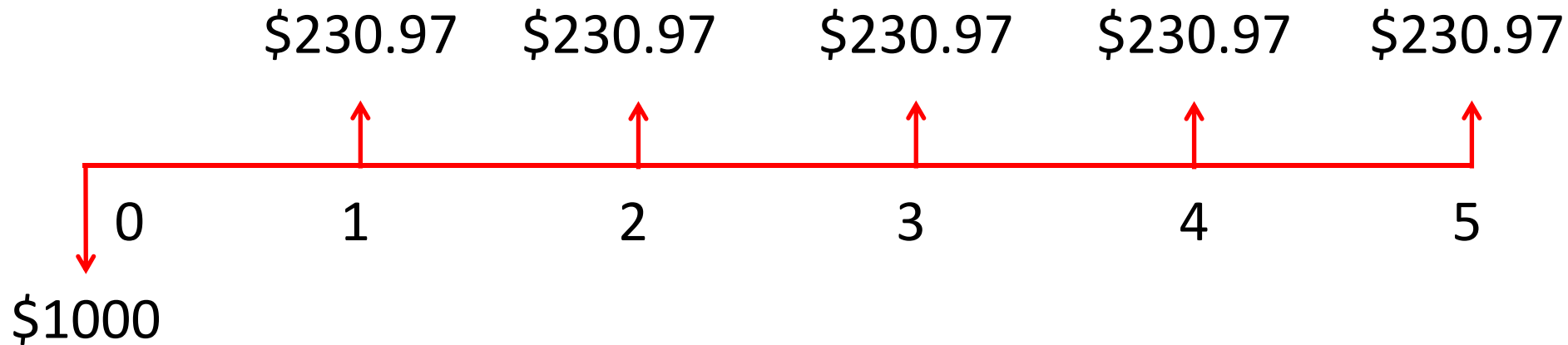
Answer:

A is correct. The entire repayment of principal occurs at maturity for a bullet(or plain vanilla) bond, whereas it occurs over time for fully and partially amortized bonds. Thus, the largest repayment of principal at maturity is that of a bullet bond.



Practice Question

A five-year bond has the following cash flows:




The bond can best be described as a:

- A. bullet bond.
- B. fully amortized bond.
- C. partially amortized bond.

Practice Question

Answer:

B is correct. A bond that is fully amortized is characterized by a fixed periodic payment schedule that reduces the bond's outstanding principal amount to zero by the maturity date. The stream of \$230.97 payments reflects the cash flows of a fully amortized bond with a coupon rate of 5% and annual interest payments.



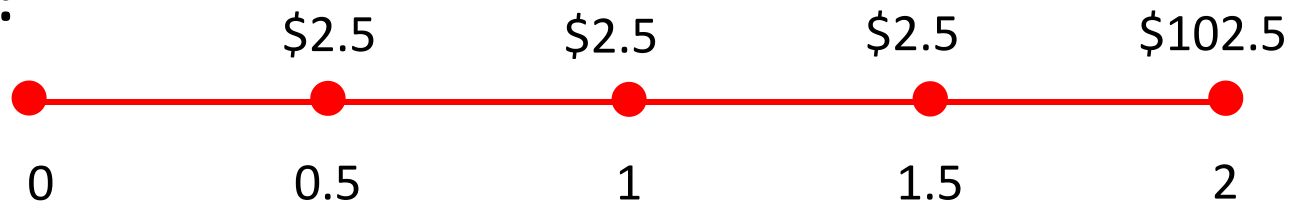
Coupon Payment Structure

Fixed-rate coupon bonds (固定利率债券)

- Pays a fixed periodic coupon over a specified time to maturity, e.g. plain vanilla bond/conventional bond.
- ✓ **Zero-coupon (pure discount) bond:** do not pay coupon.

Question: A two years bond which has a par value of \$100, with 5% coupon paid semi-annually. What is the cash flow for the bonds?

Answer:



Coupon Payment Structure

Floating-Rate notes (浮动利率债券, FRN)

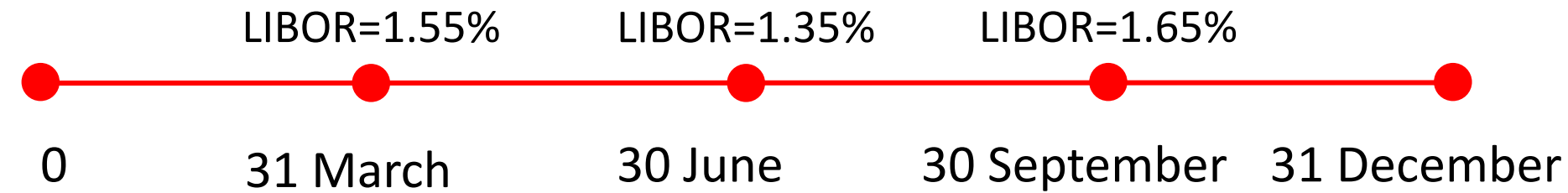
- Do not have a fixed coupon, and coupon rate is linked to an external reference rate, such as LIBOR.
- ✓ **Coupon rate = reference rate + quoted margin (spread)**
 - Reference rate reset periodically, quoted margin is usually constant.
 - Coupon payments are **in arrears**: based on previous period's reference rate.
 - Almost all FRNs have quarterly coupons.

Practice Question

Q1. A floating-rate note has a par value of \$1000, with a coupon rate equal to the 90days Libor + 65 basis points. Interest payments are made quarterly on 31 March, 30 June, 30 September, and 31 December. On 31 March, 30 June, 30 September the 90days Libor is 1.55%, 1.35%, 1.65%. What is the coupon payment on 30 June and 30 September?

Practice Question

Answer:



✓ coupon rate on 30 June = $0.65\% + 1.55\% = 2.2\%$

(P.S 使用前一期的Libor)

✓ coupon payment on 30 June = $\$1000 \times \frac{2.2\%}{4} = \5.5

✓ coupon rate on 30 September = $0.65\% + 1.35\% = 2\%$

(P.S 使用前一期的Libor)

✓ coupon payment on 30 September = $\$1000 \times \frac{2\%}{4} = \5

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Bond Valuation Process

01 / Estimate the expected cash flows

Steps 02 / **Determine the discount rate**

03 / Calculate the present value of all the estimated cash flows and add them up



Bond Valuation

Determine the discount rate

- 对于一个债券，其未来现金流是已知的，所以对债券的定价就只有一个变量——Discount rate（折现率）。
- Common bond valuation methods:
 - ✓ Yield-to-maturity（持有期收益率，YTM）
 - ✓ Spot rate（即期利率）
 - ✓ Forward rate（远期利率）

Bond Valuation - YTM

Pricing bond with YTM

- Bond price is the present value of the promised cash flows.
 - ✓ The yield-to-maturity is the internal rate of return on the cash flows, the uniform interest rate.
 - ✓ It also called redemption yield or yield-to-redemption.

$$P = \sum_{t=1}^n \frac{PMT_t}{(1 + YTM)^t} + \frac{F}{(1 + YTM)^n}$$



Practice Question

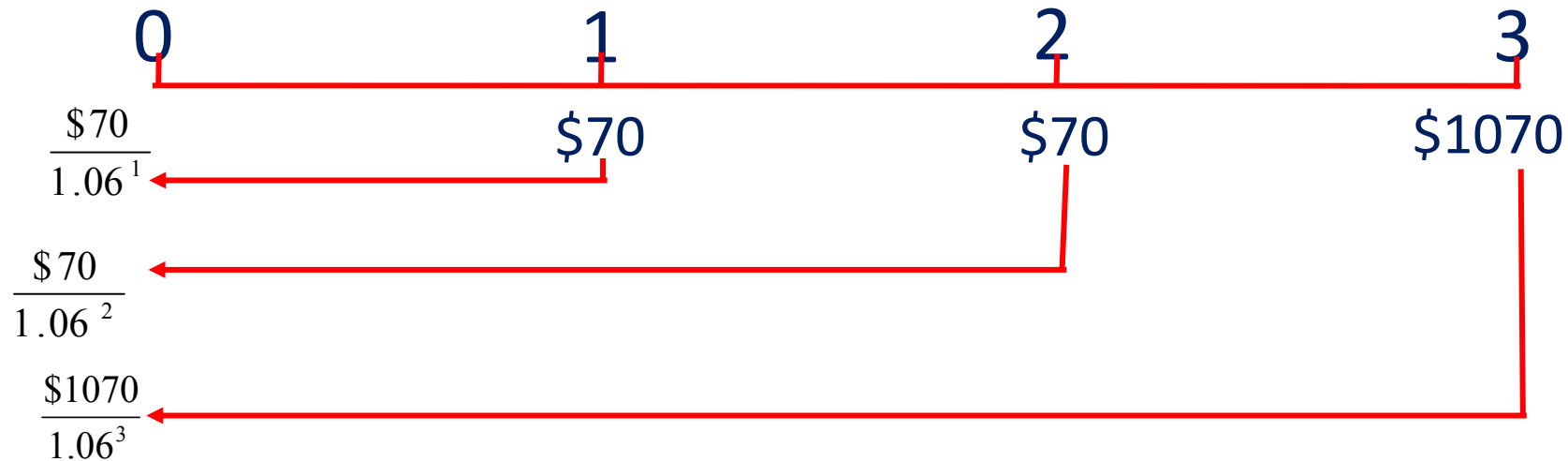
If the YTM is 6%, the value of a three-year bond that has a 7% coupon rate, has a maturity (par) value of \$1,000, and pays interest annually is closest to:

- A. \$1,026.73.
- B. \$1,049.17.
- C. \$973.76.



Practice Question

YTM=6%



Answer: A
$$\frac{\$70}{1.06^1} + \frac{\$70}{1.06^2} + \frac{\$1070}{1.06^3} = \$1026.73$$

Using financial calculator : N=3 ; I/Y=6 ; PMT=70 ; FV=1000

CPT : PV=-1026.73

Bond Valuation - YTM

发行一个面值100的债券，能融到多少钱？

> 100

$= 100$

< 100



Practice Question

Q1. Suppose that a three-year, 5% annual coupon payment with a par value of \$100 and YTM is 3%. What is the bond price?

$$\frac{\$5}{(1+3\%)} + \frac{\$5}{(1+3\%)^2} + \frac{\$105}{(1+3\%)^3} = \$105.66$$

When coupon rate > YTM, the bond is priced at premium,
or a premium bond.



Practice Question

Q2. Suppose that a three-year, 5% annual coupon payment with a par value of \$100 and YTM is 5%. What is the bond price?

$$\frac{\$5}{(1+5\%)} + \frac{\$5}{(1+5\%)^2} + \frac{\$105}{(1+5\%)^3} = \$100$$

When coupon rate = YTM, the bond is priced at par, or a par bond.



Practice Question

Q3. Suppose that a three-year, 5% annual coupon payment with a par value of \$100 and YTM is 7%. What is the bond price?

$$\frac{\$5}{(1 + 7\%)} + \frac{\$5}{(1 + 7\%)^2} + \frac{\$105}{(1 + 7\%)^3} = \$94.75$$

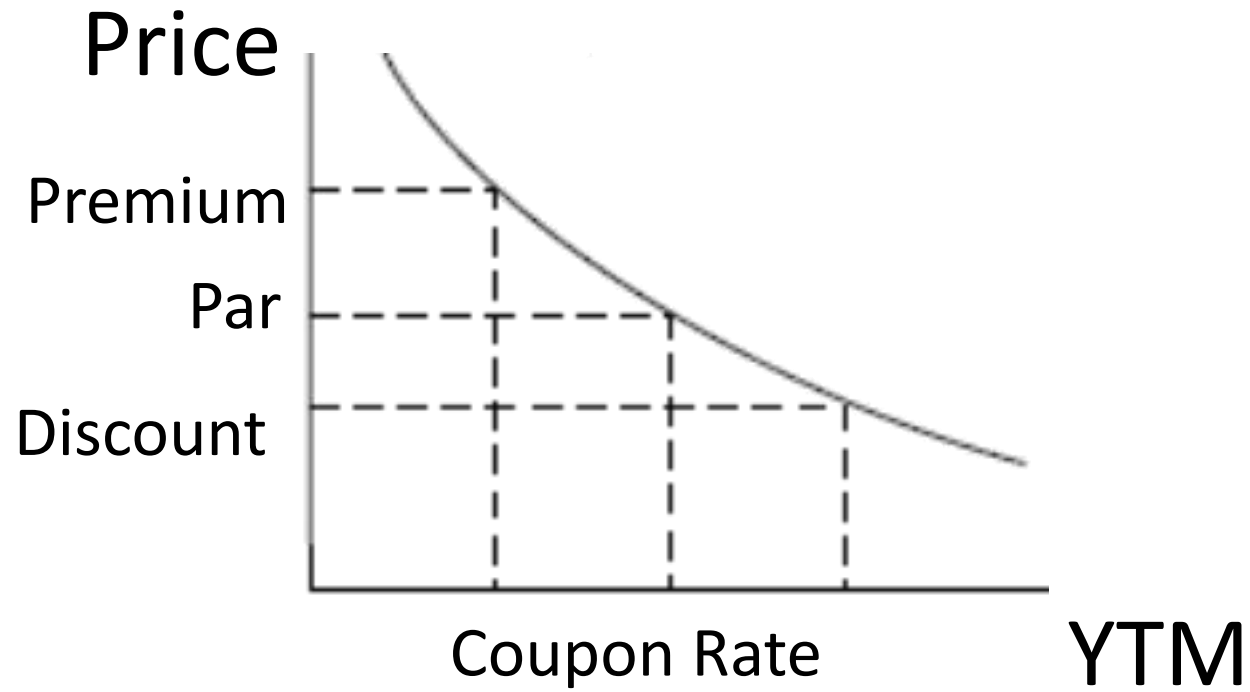
When coupon rate < YTM, the bond is priced at discount, or a discount bond.



Bond Valuation - YTM

Relationship between bond price & YTM :

- The bond price is inversely related to the YTM



Bond Valuation - YTM

- If the market price of a bond is known, the valuation equation can be used to calculate its YTM.
- 其实这样更有意义
 - ✓ 原因：债券的价格是交易出来的，在市场上是能够看得到的，不是定价定出来的。

$$P = \sum_{t=1}^n \frac{PMT_t}{(1 + YTM)^t} + \frac{F}{(1 + YTM)^n}$$

Practice Question

Q1. A 6% 25-year bond with semiannual payments has a market price of \$850.00. The yield to maturity of this bond is closest to:

A. 7.91%. B. 5.72%. C 7.32%.

Answer: C

$$850 = \frac{30}{(1 + YTM/2)^1} + \frac{30}{(1 + YTM/2)^2} + \dots + \frac{30}{(1 + YTM/2)^{49}} + \frac{1030}{(1 + YTM/2)^{50}}$$

Using financial calculator : N=50 ; PV=-850 ; PMT=30 ;
FV=1000 ;

CPT : I/Y=3.66% （注意: 不要忘记乘以2，因为这里算出来的是半年的收益率，而YTM是年化收益率。）

Bond Valuation - YTM

Q2. An investor purchases a 5% coupon bond maturing in 15 years for par value. Immediately after purchase, the yield by the market increases. The investor would then most likely have to sell the bond at:

- A. par.
- B. a premium.
- C. a discount.

Answer: C



Bond Valuation – Spot Rate

Pricing bond with Spot rate

➤ **Spot rates/zero rates:** yields-to-maturity on zero-coupon bonds maturing at the date of each cash flow.

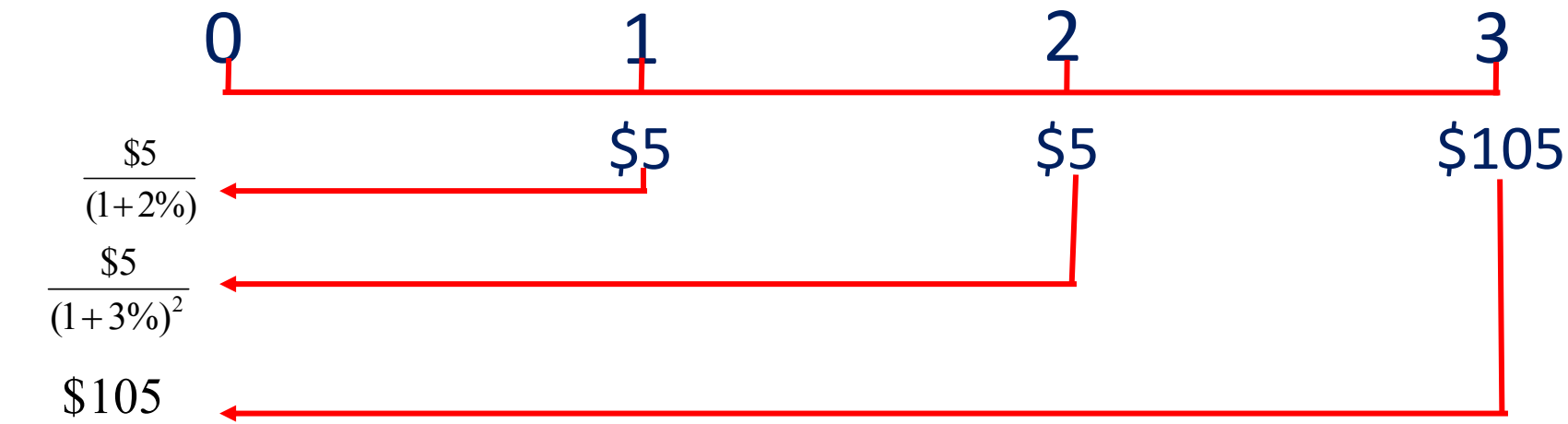
➤ **Pricing Bonds with Spot Rates**

$$PV = \frac{PMT}{(1+Z_1)^1} + \frac{PMT}{(1+Z_2)^2} + \dots + \frac{PMT + FV}{(1+Z_N)^N}$$

- ✓ Z_1 = spot rate, or the zero-coupon yield, for Period 1
- ✓ Z_2 = spot rate, or the zero-coupon yield, for Period 2
- ✓ Z_N = spot rate, or the zero-coupon yield, for Period N

Practice Question

Q1. Suppose that the one-year spot rate is 2%, the two-year spot rate is 3%, and the three-year spot rate is 4%. Then, what is the price of a three-year bond that makes a 5% annual coupon payment with a par value of \$100?


$$P = \frac{\$5}{(1+2\%)} + \frac{\$5}{(1+3\%)^2} + \frac{\$105}{(1+4\%)^3} = \$102.96$$

Practice Question

Q2. Treasury spot rates on a semiannual bond are provided below.

Maturity	Semi-annual Bond spot rates
0.5 years	0.40%
1.0 years	0.80%
1.5 years	1.00%
2.0 years	1.10%
2.5 years	1.20%

Practice Question

Q2. Cont.

Using these spot rates, the value of a 2.5-year Treasury security that makes semiannual payments based on a 2% coupon rate is *closest to*:

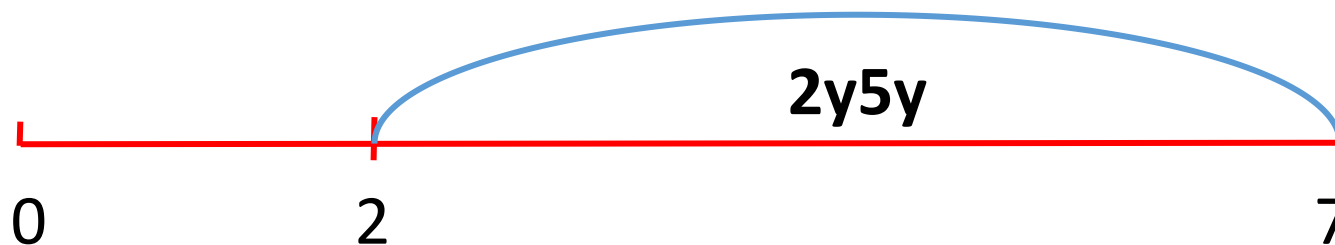
A. 106.88 B. 99.06 C. 101.98.

Answer: C

$$\frac{1}{(1+0.4\%/2)^1} + \frac{1}{(1+0.8\%/2)^2} + \frac{1}{(1+1\%/2)^3} + \frac{1}{(1+1.1\%/2)^4} + \frac{101}{(1+1.2\%/2)^5} = 101.98$$

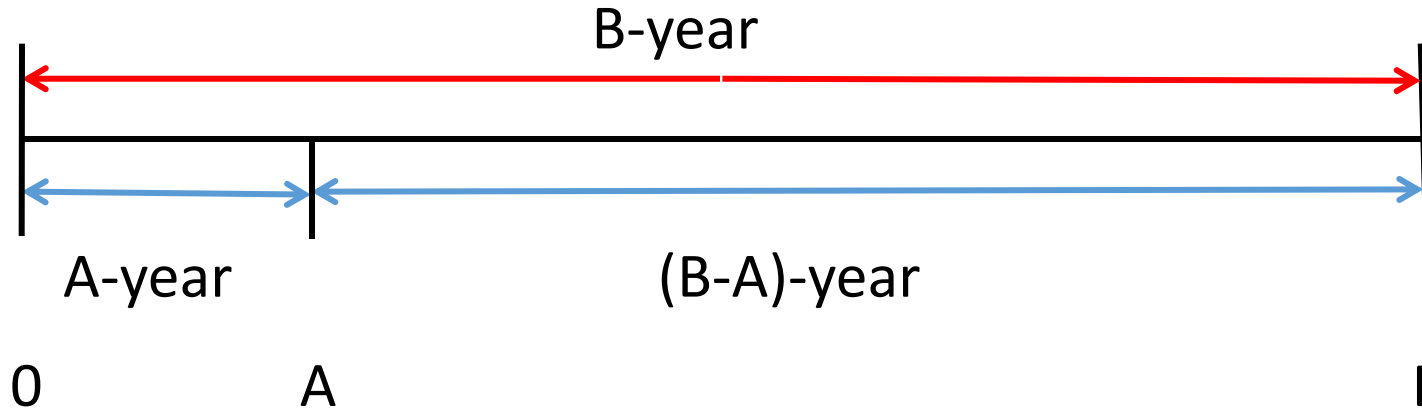
Bond Valuation – Forward Rate

- **Forward rate:** the interest rate on a bond or money market instrument traded in a forward market.
- ✓ “**2y5y**” means “the two year into five-year rate” (第一个数字2表示远期利率起始时间是第二年年末；第二个数字5表示远期利率距离到期日有5年。)
- 远期利率和即期利率是对应的。即期利率开始于现在(零时刻)，结束于未来；远期利率开始于未来，结束于更未来。二者有密切的联系。



Bond Valuation – Forward Rate

➤ Relationship between forward rates and spot rates



两种投资方式：

第一种方式：以即期利率 Z_B 投资B年

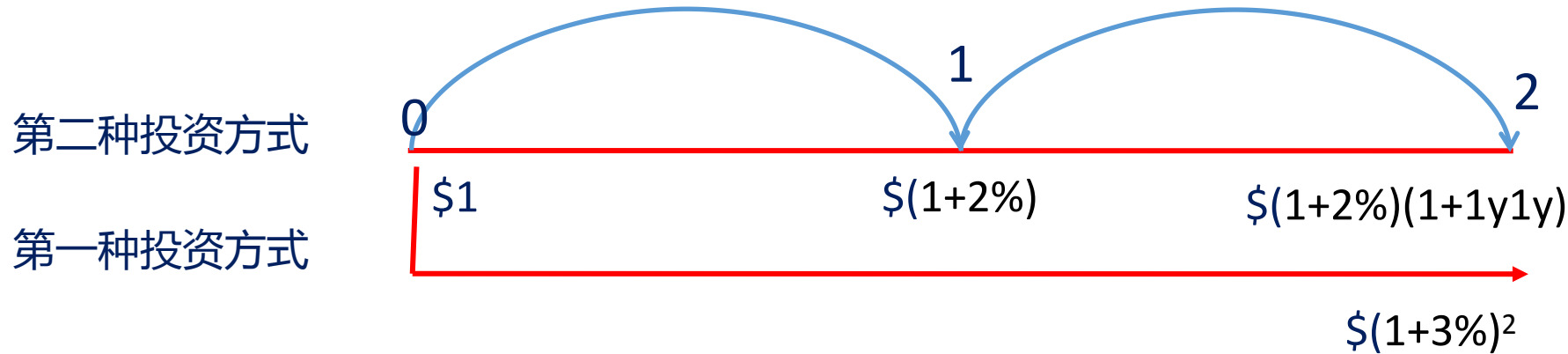
第二种方式：先以即期利率 Z_A 投资A年，再以远期利率 $Ay(B-A)y$ 投资(B-A)根据无套利定价原理，两种投资方式投资结果应该是一样的。

$$(1 + Z_A)^A \times [1 + Ay(B-A)y]^{B-A} = (1 + Z_B)^B$$

$Ay(B-A)y$ is a forward rate that starts in period A and ends in period B, its tenor is (B - A) periods.

Practice Question

Q1. Suppose that the one-year spot rate is 2%, the two-year spot rate is 3%, compute the “1y1y” implied forward rate.



Answer:

$$(1 + 2\%) \times (1 + 1y1y) = (1 + 3\%)^2 \rightarrow 1y1y = 4.01\%$$

Practice Question

Q2. Assume the yields to maturity on four-year and five-year zero-coupon bonds are 4.67% and 5.35%, respectively, stated on a semiannual bond basis. The "4y1y" implied forward rate is closest to:

- A. 8.092%.
- B. 8.114%.
- C. 4.046%.

Answer: A

$$\left(1 + \frac{0.0467}{2}\right)^8 \left(1 + \frac{4y1y}{2}\right)^2 = \left(1 + \frac{0.0535}{2}\right)^{10}$$



Practice Question

Q3. The 3-year implied spot rate is closest to:

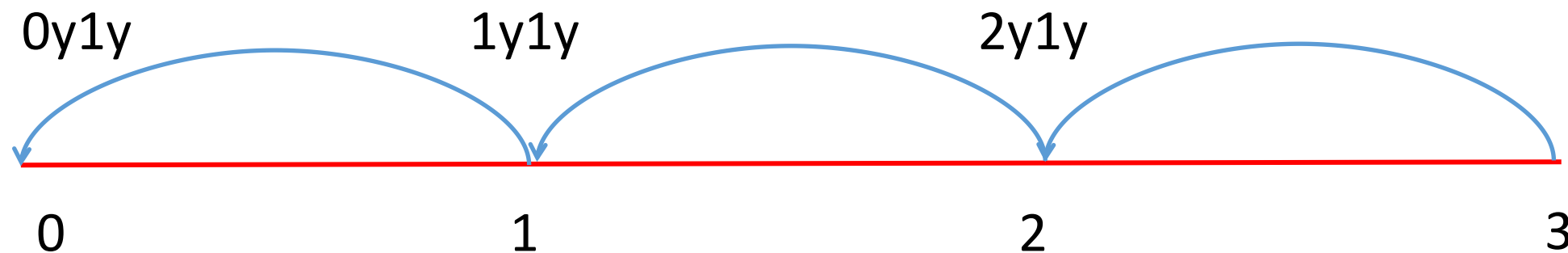
Time Period	Forward Rate
0y1y	0.80%
1y1y	1.12%
2y1y	3.94%
3y1y	3.28%
4y1y	3.14%

A. 1.18% B. 1.94% C. 2.28%

Answer: B $(1.0080 \times 1.0112 \times 1.0394) = (1 + Z_3)^3$

Bond Valuation – Forward Rate

- Forward rates can be used to value a bond in the same manner as spot rates because they are interconnected.
- 用远期利率给债券定价，其实质与用即期利率给债券定价一样。即未来现金流折现求和。



Practice Question

某三年期债券票息率是6%，面值为100。其中 $0y1y=3\%$ ， $1y1y=4\%$ ， $2y1y=5\%$ ，求该债券价格是多少？

Answer:

$$P = \frac{6}{(1+3\%)} + \frac{6}{(1+3\%)(1+4\%)} + \frac{106}{(1+3\%)(1+4\%)(1+5\%)} = 105.67$$

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Interest Rate Risk

Interest rates risk (利率风险)

- Interest rates and a bond's price have an **inverse relationship**.

从债券定价公式中可以很容易得出结论：

$$P = \sum_{t=1}^n \frac{PMT_t}{(1+r)^t} + \frac{F}{(1+r)^n}$$

- ✓ If interest rates increase the bond price will decrease.
- ✓ If interest rates decrease the bond price will increase.



Duration（久期）

- The sensitivity of bond's full price to changes in the bond's YTM.
 - ✓ Assuming that variables other than YTM is held constant.
- 久期衡量的是债券价格对利率变动的敏感性。久期越大，债券价格对利率的变化越敏感。



Duration

➤ 根据利率对债券价格变动敏感度的不同衡量方式，把久期分为3种：

✓ 麦考利久期(Macaulay duration)是弹性

$$MacDur = \frac{dP/P}{d(1+r)/(1+r)}$$

✓ 修正久期(Modified Duration)是半弹性

$$ModDur = \frac{dP/P}{d(1+r)}$$

✓ 美元久期(Money duration/Dollar Duration)是导数

$$MonDur = \frac{dP}{d(1+r)}$$

Macaulay Duration

- 从麦考利久期的本质可以推导出书中的定义：**麦考利久期衡量的是现金流的平均回流时间，即需要多长时间能够收回本金。**

$$MacDur = \frac{dP/P}{d(1+r)/(1+r)} = \frac{dP}{d(1+r)} \times \frac{(1+r)}{P}$$

$$P = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} \text{ (对价格进行求导)}$$

$$\frac{dP}{d(1+r)} = -\frac{1}{1+r} \sum_{t=1}^n t \frac{CF_t}{(1+r)^t}$$

$$MacDur = \frac{dP/P}{d(1+r)/(1+r)} = \frac{dP}{d(1+r)} \times \frac{(1+r)}{P} = \sum_{t=1}^n t \times \frac{CF_t/(1+r)^t}{P} = \frac{\sum_{t=1}^n t \times PVCF_t}{\sum PVCF}$$

Macaulay Duration

麦考利久期(Macaulay Duration)

➤ Definition: weighted average time to receipt of the bond's promised payments, where the weights are the shares of the full price that correspond to each of the bond's promised future payments.

$$\begin{aligned} MacDur &= \frac{\sum_{t=1}^n t \times PVCF_t}{\sum PVCF} = \sum_{t=1}^n t \times \frac{PVCF_t}{P} \\ &= 1 \times \frac{PVCF_1}{P} + 2 \times \frac{PVCF_2}{P} + \dots + n \times \frac{PVCF_n}{P} \end{aligned}$$

Practice Question

Q1. 有一个三年到期的零息债券，到期收益率为5%，计算其麦考利久期。

Answer:

$$MacDur = 6 \times \frac{1000 / (1.025)^6}{P}$$

$$P = \frac{1000}{(1.025)^6} = 862.30$$

$$MacDur = 6期 = 3年$$

结论：
零息债券的麦考利久期就是其到期时间
(Maturity)

Practice Question

Q2. 某两年到期的公司债券，面值为1000，票息率为10%，每半年付息。目前的 market 价格为1000元，求麦考利久期。

Answer:

$$\begin{aligned} MacDur &= 0.5 \times \frac{50/1.05}{1000} + 1 \times \frac{50/1.05^2}{1000} \\ &+ 1.5 \times \frac{50/1.05^3}{1000} + 2 \times \frac{1050/1.05^4}{1000} \\ &\approx 1.86 \text{ 年} \end{aligned}$$

结论：

付息债权的麦考利
久期小于其到期时
间（Maturity）

Modified Duration

修正久期(Modified Duration)

➤ Definition

- ✓ Requires a simple adjustment to Macaulay Duration
- ✓ A measure of the percentage price change given a change in its YTM (利率变动1% , 债券价格变动百分之几)

➤ Formula
$$ModDur = \frac{MacDur}{1+r} = \frac{dP/P}{d(1+r)} = -\frac{1}{P} \frac{dP}{d(1+r)}$$

$$\frac{dP}{P} = -ModDur \times d(1+r)$$

Modified Duration

Q1. 三年期零息债券，YTM=5%，求修正久期。

Answer:

$$ModDur = \frac{MacDur}{1+r} = \frac{3}{(1+5\%/2)} = 2.93$$

结论：修正久期一定小于其麦考利久期

Practice Question

Q2. A bond with a par value of \$100 matures in 10 years with a coupon of 4.5% paid semiannually; it is priced to yield 5.83% and has a modified duration of 7.81. If the yield of the bond declines by 0.25%, the approximate percentage price change for the bond is closest to:

A. 3.91%. B. 0.98%. C. 1.95%.

Answer: C

Approximate percentage price change

$$= -[7.81 \times (-0.0025)] = 0.01953 \text{ or } 1.95\%.$$



Money Duration

美元久期(Money duration/Dollar Duration)：

➤ Definition

- ✓ 美元久期=修正久期*Price
- ✓ A measure of the price change **in units of currency** given a change in its YTM (利率变动1% , 债券价格变动多少) 。

➤ Formula $MonDur = ModDur \times P = \frac{dP}{d(1+r)}$

Practice Question

1. Calculate the money duration on a \$2 million par value bond portfolio that has a modified duration of 7.42 and a full price of \$101.32 per \$100 par value (expressed for the whole bond portfolio)
2. What will be the impact on the value of the bond portfolio of a 25 basis points increase in its YTM ?

Answer:

1. $7.42\% \times 2,000,000 \times 1.0132 = \$150,358.88$
2. $\$150,358.88 \times 0.25 = \$37,589.72$

The bond value decreases by \$37,589.72
(利率上升 , 债券价值下降)

CONTENTS

Fixed Income

01 Fixed Income Securities

02 Bond Valuation

03 Fixed Income Risk and Return

04 Mortgage-backed security (MBS)



Asset-Backed Securities

资产证券化（ABS）是指企业或金融机构把缺乏流动性担忧稳定未来现金流的资产进行组合，以资产池为支撑向市场发行ABS。信贷资产证券化是近三十年来世界金融领域**最重大的创新之一**。



Asset-Backed Securities

资产证券化

起源于20世纪70年代。60年代后期，美国经济陷入了衰退，通货膨胀率较高，促使市场利率上升，从事住房抵押贷款业务的储蓄与贷款协会（ Saving and Loan Association ）的短存长贷的弊端显露出来。

储蓄资金被大量提取，而贷款的长期性质让储蓄机构产生流动性困难

另一方面由于利率管制，利差倒挂，储蓄与贷款协会的收益迅速下降，经营状况恶化。

Asset-Backed Securities



■ 为帮助储蓄与贷款协会摆脱困境，美国政府决定启动**住房抵押贷款二级市场**，以**缓解资产流动性不足**的问题。

■ **2011**年美国的MBS发行量超过**1.6**万亿美元。

Parties to a Securitization



LOAN
→
←
CASH

Seller of the collateral

一般是发放贷款的金融机构，也可以是其他类型的公司。发起人一般通过购买或提供融资两种方式建立资产池。



SPV

SPV是一个中介机构，接受发起人转让的资产池，然后直接发行ABS，或者把资产进一步转让给信托机构，由后者发行ABS。

SELL
→
←
CASH



Investors



Parties to a Securitization



Lawyer:

- Responsible for preparing the legal documents

A **trustee** or **trustee agent** is typically a financial institution with

- trust powers that safeguards the assets after they have been sold to the SPE,
- holds the funds due to the ABS holders until they are paid,
- and provides periodic information to the ABS holders.



Underwriters and rating agencies :

- doing a standard bond offering



Asset-Backed Securities



Advantages for Commercial Bank

1. 有利于商业银行资产负债的合理搭配，确保商业银行的流动性（Liquidity）

在贷款缺乏二级市场的情况下，商业银行自有对其贷款大打折扣才能实施转让；而被迫短时间内出售大量所持证券，商业银行也必然遭受资本损失。

2. 有利于降低和分散商业银行的风险

信贷资产包括违约风险(Default Risk)、市场利率风险(interest risk)、通货膨胀风险(inflation risk)、提前偿还风险(Prepayment Risk)等。

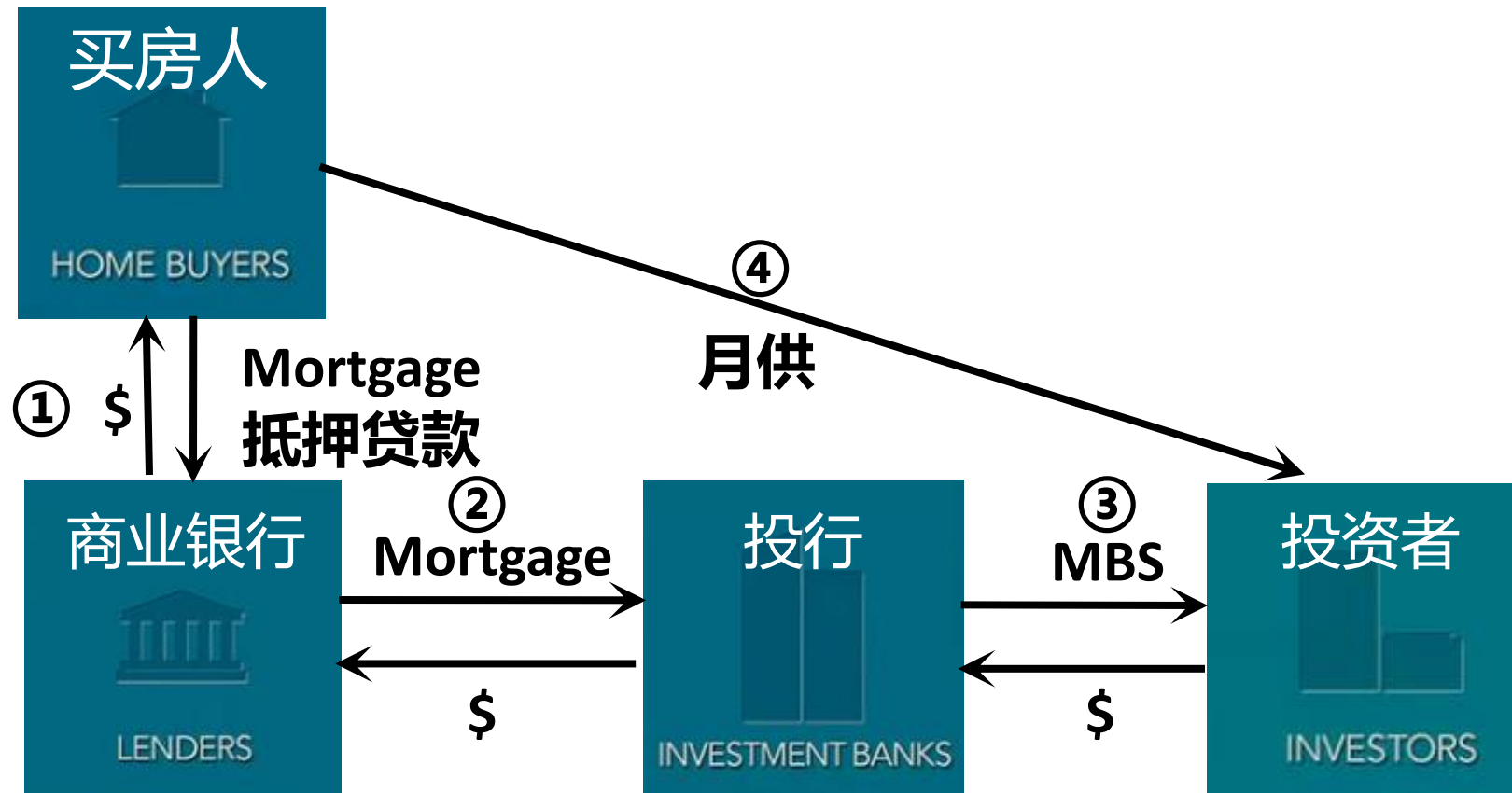


Mortgage-Backed Securities

- **Mortgage loan (住房抵押贷款):** 又称按揭，是指贷款人以自有或者第三者的物业作为抵押。并以稳定的收入分期向银行还本付息，而在未还清本息之前，用其产权证向银行作抵押，若购房者不能按照期限还本付息，银行可将房屋出售，以抵消欠款。
- **Mortgage-Backed Securities (住房担保抵押证券):** 把贷出的住房抵押贷款中符合一定条件的贷款集中起来，形成一个抵押贷款的集合体（pool），利用贷款集合体定期发生的本金及利息的现金流入发行证券。

Mortgaged-Backed Securities

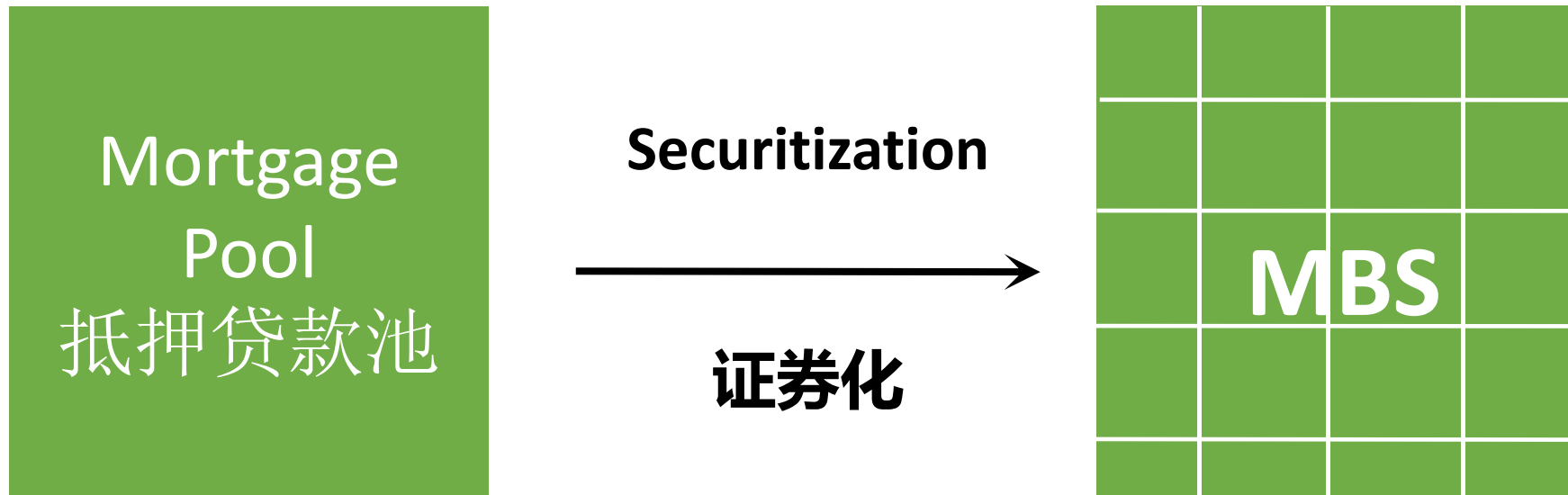
- 住房抵押贷款支持证券（MBS）是资产证券化中最早也是最重要的一种。



Mortgaged-Backed Securities

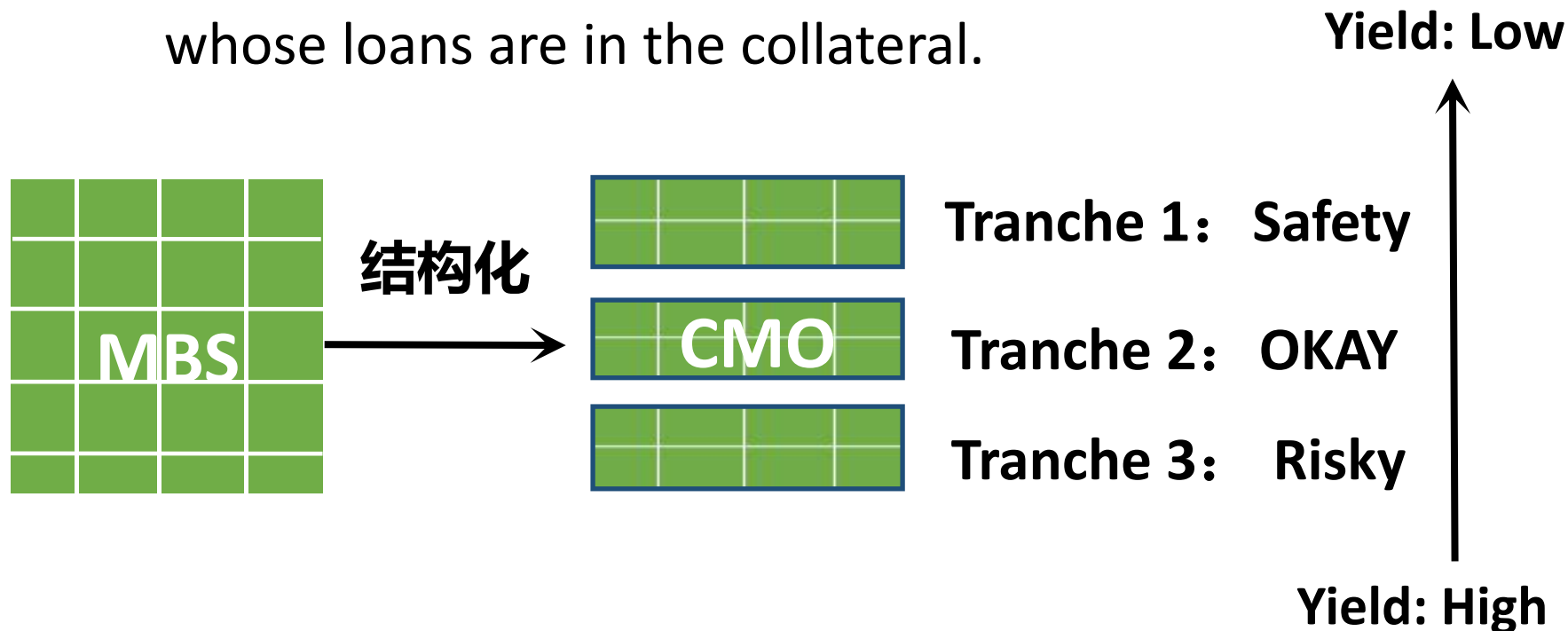
➤ MBS的生成的三个基本条件：

- 住房抵押贷款规模巨大
- 商业银行希望通过证券化以获得额外的资金来源
- 中介机构发行的MBS被投资者接受



Mortgage-Backed Securities

- **Structure of the Securitization(结构化)** : is often more complicated than a single class of ABS.
- The bond classes differ as to how they will share any losses resulting from defaults of the borrowers whose loans are in the collateral.



Collateralized Mortgage Obligations

- Collateralized mortgage obligations(CMOs) (担保式抵押契约):Cash flows of mortgage-related products are redistributed to various tranches.



Subprime Crisis

- 2007年，美国发生了严重的次贷危机，这场危机让众多金融机构遭受了巨大损失。美国五大投资银行纷纷倒下或被接管。



Subprime Crisis



2008年9月15日，雷曼兄弟宣布破产

道琼斯工业指数当天暴跌超500多点



美国政府出资
2000亿美元

接管两大房贷机构



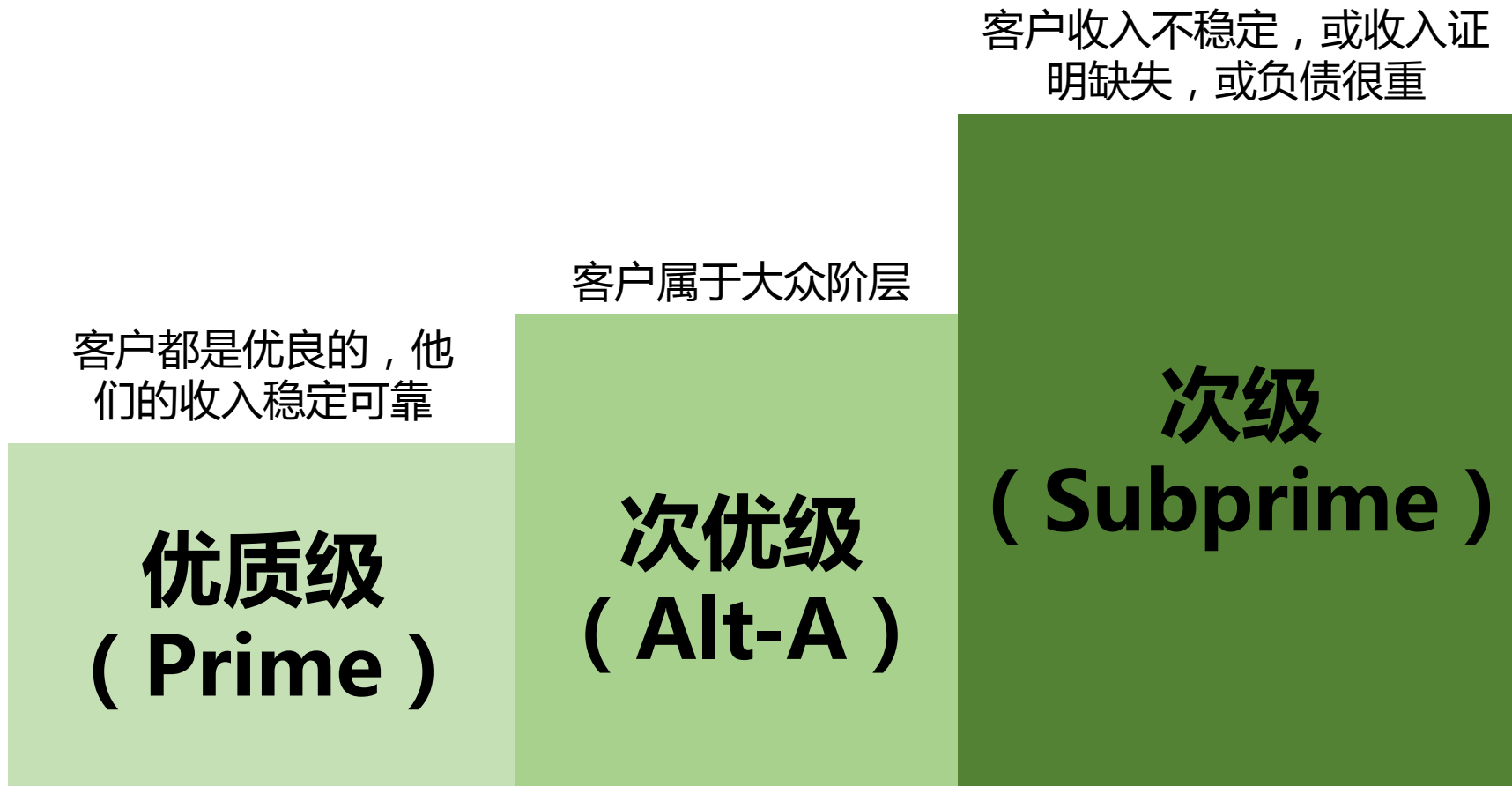
大部分的金融机构出现严重的流动性危机



Subprime Crisis

➤ 什么是次级抵押贷款？

- 在美国，住房抵押贷款时分层级的。



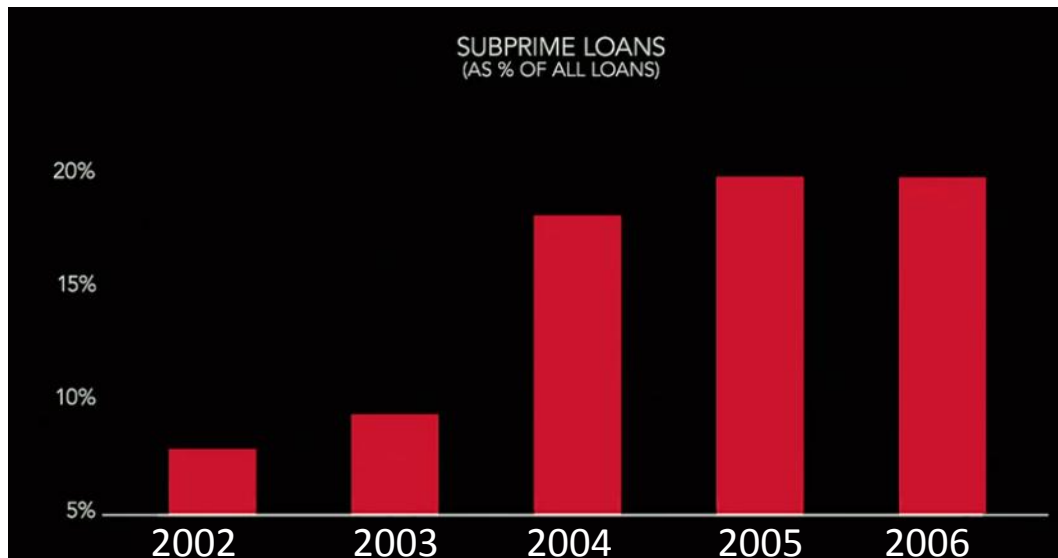
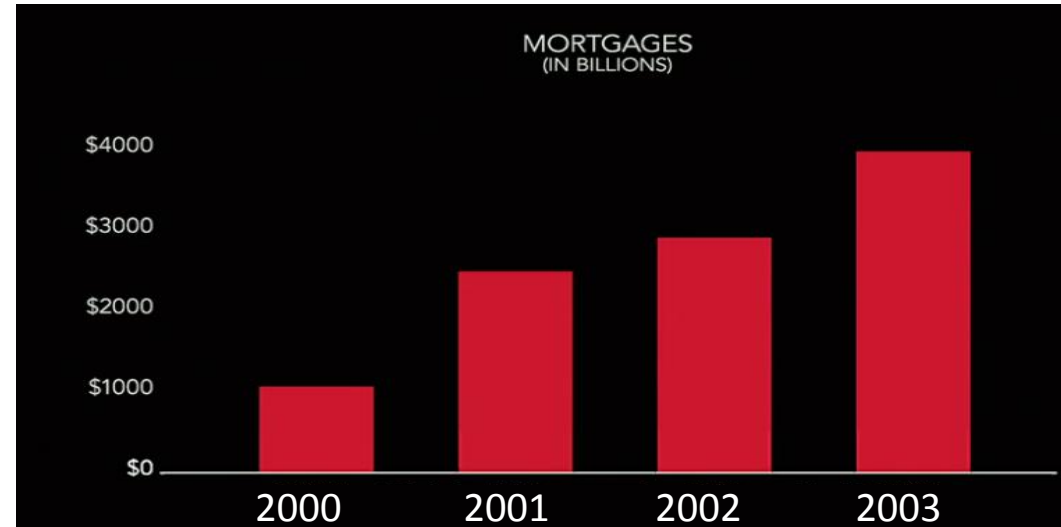
Subprime Crisis

➤ 2007年以前，供小于求，房价迅速上涨



Subprime Crisis

从2000年2003年，
美国的住房抵押贷款额度每年增加近4倍！

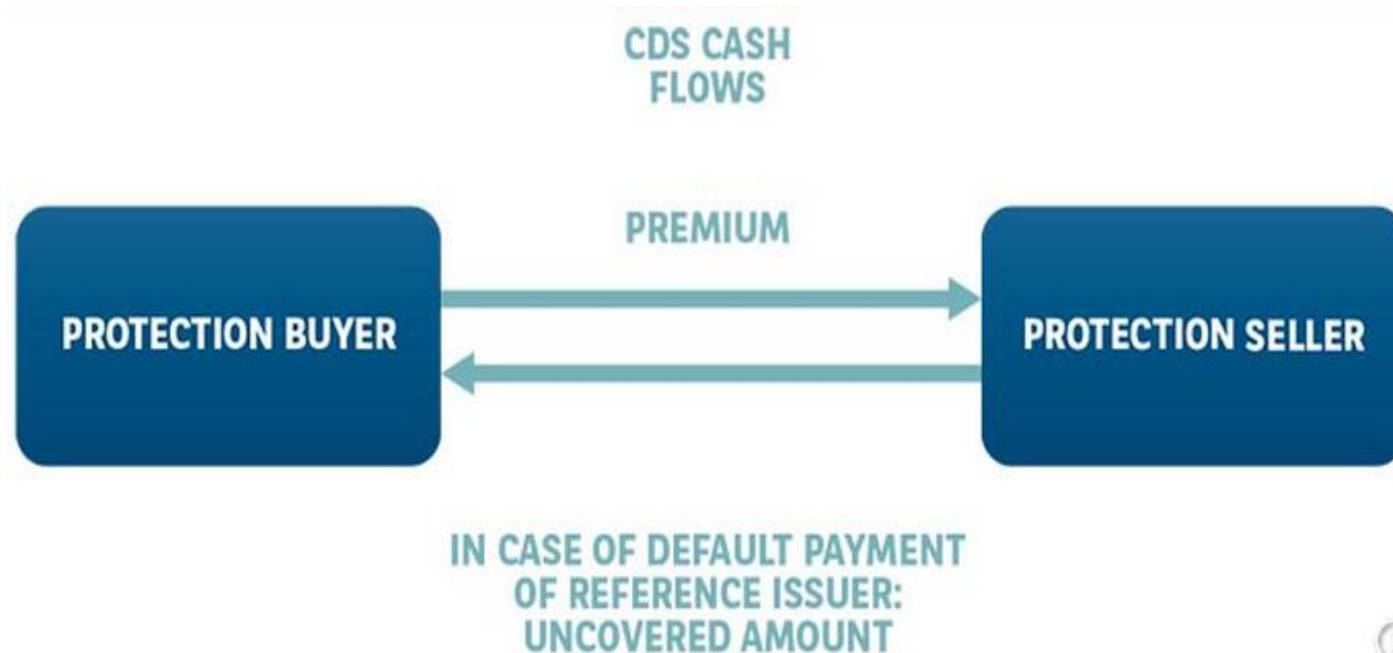


风险最大的次级贷款，逐年递增！



Collateralized Mortgage Obligations

- **Credit default swap (CDS, 信用违约掉期):** 违约互换购买者将定期向违约互换出售者支付一定费用（保险费），一旦出现违约事件，违约互换出售者有义务支付赔偿金给购买者，从而购买者能有效规避信用风险。





资金链断裂



被迫卖掉房子来还贷款



Subprime Crisis

- 2007年以后，由于无追索权，一些优质的贷款也出现了违约，导致泡沫破裂，房价迅速下降。



Subprime Crisis

- **Foreclosure(丧失抵押品赎回权)**: allow the lender to take possession of the mortgaged property and then sell it in order to recover funds if the borrower defaults.
- **Non-recourse loan(无追索权债务)**: the lender cannot claim borrower's personal assets except for collateral property.

Global Financial Crisis

➤ 2008年,全球金融危机爆发



Subprime Crisis





You're a Champion!

Thanks for staying with us. You have finished this chapter.