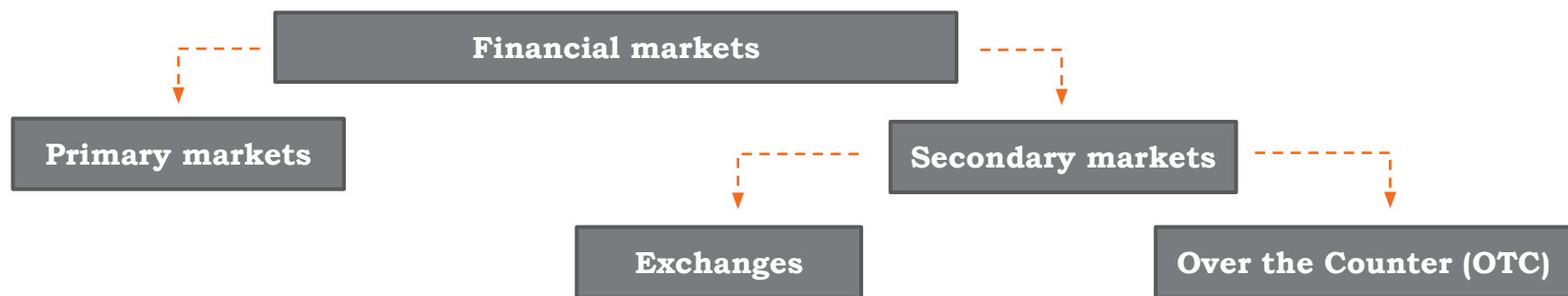


Lecture 6.
Financial markets: Debt market in details

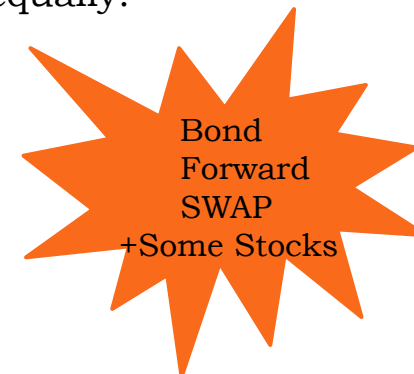
International finance and globalization



An exchange centralizes the communication of bid and offer prices to all direct market participants, who can respond by selling or buying at one of the quotes or by replying with a different quote.



Dealers act as market makers by quoting prices at which they will sell (ask or offer) or buy (bid) to other dealers and to their clients or customers. Price is not open to all participants equally.



Major Types of Financial Instruments

Debt	Equity	
	Preferred Stock	Ordinary (Common) Stock
Repayment of principal/face/par and interest (coupon)	Guaranteed (fixed) dividends	Claim on future profits (Dividends) Not obliged to make periodic payments
Have a maturity date (when face value is paid)	Do not have a maturity date	
The least volatile price -> lower capital gain/losses	More volatile price -> more capital gain/losses	The most volatile price -> the most capital gain/losses
Prior claims in case of default	Receive payments after debt holders in case of default	Junior claims in case of default (after debt and preferred stock)
Least risky	More risky	Most risky
No voting rights	No voting rights (usually)	Have voting rights (usually)
Tax deductible (coupons)	Not tax deductible (dividends)	

Key terminologies of debt/bonds (fixed income instruments)

Maturity – lifetime of a bond

Face value/Principal/Par – nominal value of a bond, paid at the maturity

Coupon – interest payment (% of face value) that bondholders receive during the period between issuance and maturity of the underlying bond (fixed cash flow)

Fixed coupon

Floating coupon – fixed spread over a benchmark, e.g. Fed Fund rate, LIBOR etc.

Periodicity of coupon payments – most European bonds pay coupons annually
Most bonds in UK, Japan, Canada and USA pay coupons semi-annually

Fair Price – it is the present value of a bond. Bond prices are typically expressed as a percentage of face value

Market Price – actual quoted price on market

Yield to maturity (similar to IRR) – it the total return anticipated on a bond if it is held until maturity

Types of Bond Issuers – Governments, Corporates

$$P (\textit{Fair Price}) = \frac{C}{(1+i)^1} + \frac{C}{(1+i)^2} + \frac{C}{(1+i)^3} \dots + \frac{C+FV}{(1+i)^N}$$

N – Years to maturity

C – coupon payment ($C=FV \cdot c$)

c – coupon rate

FV – Face value/Principal/Par

i – discount rate (yield on other bonds with the same level of risk)

Debt Valuation: Example

Example 1

French government bonds, known as OATs (short for Obligations Assimilables du Trésor). Suppose that in December 2008 you decide to buy a OAT with face value of €100 and 8.5% fixed coupon rate. The OAT is maturing in December 2012. In December 2008, other medium-term French government bonds offered a return of 3.0%. Calculate fair price of the bond.

Year	Period (t)	CF	DCF
2009	1	€ 8.5	€ 8.5 / (1.03)
2010	2	€ 8.5	€ 8.5 / (1.03) ²
2011	3	€ 8.5	€ 8.5 / (1.03) ³
2012	4	€ 108.5	€ 108.5 / (1.03) ⁴

$$P = \text{€ } 120.4$$

Assume that market price of this bond is currently € 122.0

What would you do? **Sell (short)**

Classification of bonds based on cash-flow

Straight/Bullet coupon bond – Periodic payments with single payment at maturity

Annuity bond – It pays a mix of interest and principal for a finite period of time, i.e. no balloon payment at the end

Zero coupon bond – No periodic payment; single payment at maturity

Perpetuity bond – It lasts forever and only interest is paid every period (much closer to stocks)

Floating rate coupon bond – coupon depends on some interest rate (LIBOR, etc)

$$P_m (\text{Market Price}) = \frac{C}{(1+ytm)^1} + \frac{C}{(1+ytm)^2} + \frac{C}{(1+ytm)^3} \dots + \frac{C+FV}{(1+ytm)^N}$$

N – Years to maturity

C – coupon payment ($C=FV*c$)

c – coupon rate

FV – Face value/Principal/Par

ytm – yield to maturity (total annual return anticipated on a bond if the bond is held until it matures)

Example 1: cont'd

French government bonds, known as OATs (short for Obligations Assimilables du Trésor). Suppose that in December 2008 you decide to buy a OAT with face value of €100 and 8.5% fixed coupon rate. The OAT is maturing in December 2012. In December 2008, other medium-term French government bonds offered a return of 4.0%. The market price is € 122.0. Calculate yield to maturity of the bond.

$$\mathbf{\text{€}122} = \frac{\mathbf{\text{€}8.5}}{(1+ytm)^1} + \frac{\mathbf{\text{€}8.5}}{(1+ytm)^2} + \frac{\mathbf{\text{€}8.5}}{(1+ytm)^3} + \frac{\mathbf{\text{€}108.5}}{(1+ytm)^4}$$

$$\mathbf{ytm = 2.63\%}$$

Compare the ytm with opportunity cost of capital. What would you do?

Sell (short) the bond and invest in other medium-term French government bonds offered a return of 4.0%

YTM: Quick calculation

Example 1: cont'd

French government bonds, known as OATs (short for Obligations Assimilables du Trésor). Suppose that in December 2008 you decide to buy a OAT with face value of €100 and 8.5% fixed coupon rate.

The OAT is maturing in December 2012. In December 2008, other medium-term French government bonds offered a return of 3.0%. The market price is € 122.0.

Calculate yield to maturity of the bond.

t=0	t=1	t=2	t=3	t=4	
-122%	+8.5%	+8.5%	+8.5%	+8.5%	+100%
122%-100%=22% 22%/4years=5.5%	-5.5%	-5.5%	-5.5%	-5.5%	
	3%	3%	3%	3%	

ytm < 3% (as we did not discount)

ytm = 2.63%

Exercise 2

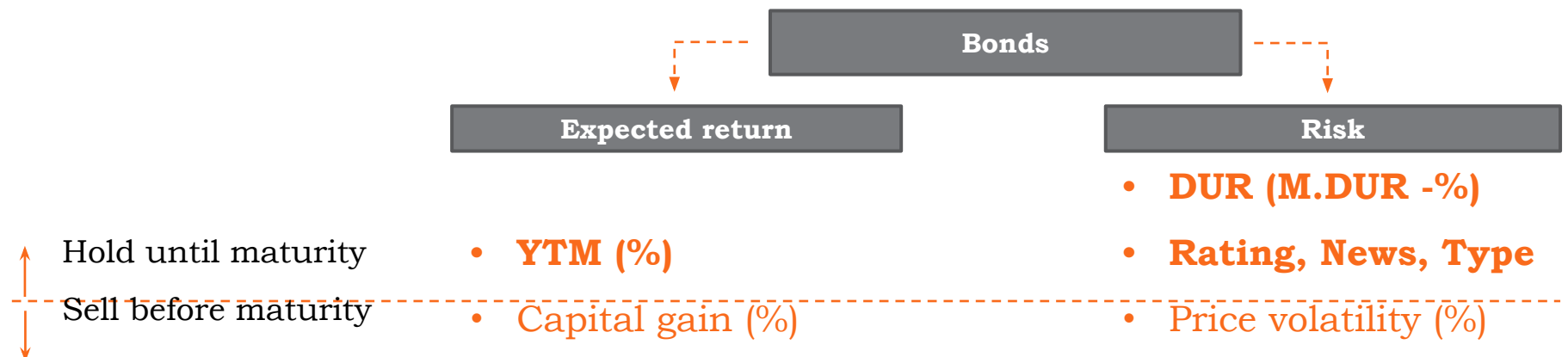
What is the intrinsic (fair) value for a 2 year 5% annual riskless coupon bond given the following data with par value of bond £1,000? Assume you know some facts:

- 1 year zero coupon Treasury bill is traded at £90,9
- 2 year zero coupon Treasury bill is traded at £79,7

Demonstrate your strategy (long or short), if current market price for the bond from the first question is 90% of par.

How to compare bonds? Where to invest?

- YTM
- Potential capital gain/loss (if you sell a bond before maturity)
- Rating
- Duration
- Fundamental analysis (news)
- Seniority of debt (Recovery rate) (Senior secured/Senior Unsecured/Subordinate)



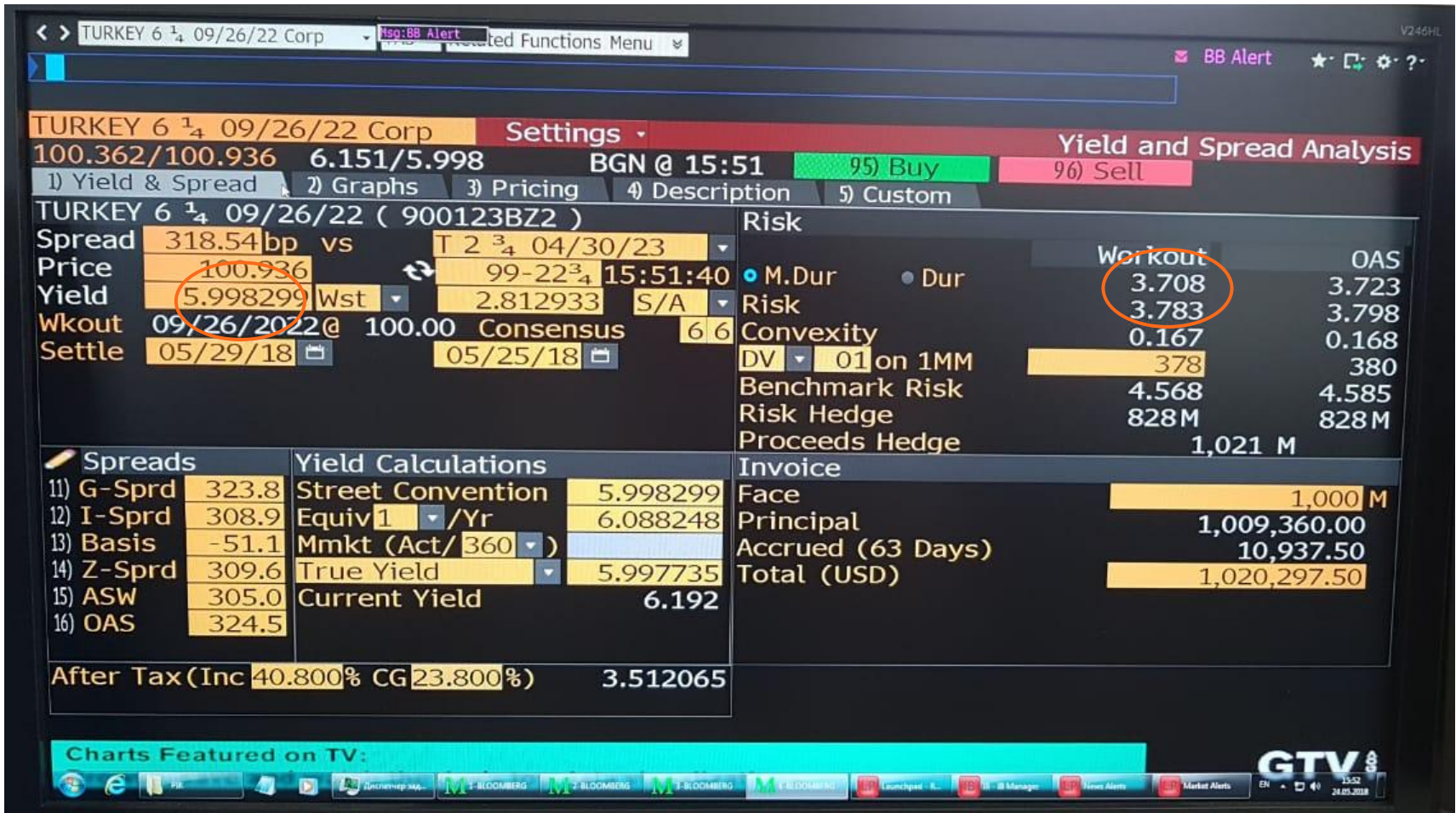
TURKEY 6 1/4 09/26/22 Corp Ins:BB Alert

TURKEY 6 1/4 09/26/22 \$100.649 +.463 100.362 / 100.936 6.151 / 5.998
 At 15:51 Source BGN

TURKEY 6 1/4 09/26/22 Cor Settings Page 1/11 Security Description: Bond

25) Bond Description 26) Issuer Description 94) Notes 95) Buy 96) Sell

Pages 11) Bond Info 12) Addtl Info 13) Covenants 14) Guarantors 15) Bond Ratings 16) Identifiers 17) Exchanges 18) Inv Parties 19) Fees, Restrict 20) Schedules 21) Coupons Quick Links 32) ALLQ Pricing 33) QRD Quote Recap 34) TDH Trade Hist 35) CACS Corp Action 36) CF Prospectus 37) CN Sec News 38) HDS Holders 39) VPRD Underly Info 66) Send Bond	Issuer Information		Identifiers	
	Name REPUBLIC OF TURKEY		ID Number	EI9661808
	Industry Sovereigns		CUSIP	900123BZ2
	Security Information		ISIN	US900123BZ27
	Mkt Iss	Global	Bond Ratings	
	Country	TR	Moody's	Ba2
	Rank	Sr Unsecured	S&P	NR
	Currency	USD	Fitch	BB+
	Series		DBRS	NR
	Type	Fixed	Issuance & Trading	
	Coupon	6.250000	Amt Issued/Outstanding	
	Type	Fixed	USD	2,500,000.00 (M) /
	Cpn Freq	S/A	USD	2,500,000.00 (M)
	Day Cnt	ISMA-30/360	Min Piece/Increment	
	Iss Price	99.24400	200,000.00 / 1,000.00	
Maturity	09/26/2022	Par Amount	1,000.00	
BULLET		Book Runner	BARCBK,CITI,JPM	
Iss Sprd	+377.50bp vs T 2 11/15/21	Exchange	Multiple	
Calc Type	(1)STREET CONVENTION			
Pricing Date	01/18/2012			
Interest Accrual Date	01/26/2012			
1st Settle Date	01/26/2012			
1st Coupon Date	03/26/2012			



Change in price (modified duration)

$$\Delta P\% = -DUR * \frac{\Delta i}{1+i}$$

Exercise 1

LIBOR (London Interbank Offered Rate) is a benchmark rate that some of the world's leading banks charge each other for short-term loans.

The screenshot displays the following information:

- Top Bar:** BACR Float 08/10/21 Corp, DES, Related Functions Menu
- Main Data:** BACR Float 08/10/21 \$ 104.024, -.082, -181.0 bp vs T 2.625 05/15/2021, At 16:02, DM .000, Source BMRK
- Navigation:** 25) Bond Description, 26) Issuer Description, 94) Notes, 95) Buy, 96) Sell
- Bond Description Section:**
 - Issuer Information:** Name BARCLAYS PLC, Industry Diversified Banks
 - Security Information:** Mkt Iss Global, Country GB, Currency USD, Rank Sr Unsecured, Series, Coupon 4.462500, Type **Floating**, Formula **QUARTLY US LIBOR +211.0000**, Day Cnt AC1/360, Iss Price 100.00000, Maturity 08/10/2021, BULLET
 - Bond Ratings:** Moody's Baa3, S&P BBB, Fitch A, Composite BBB
 - Issuance & Trading:** Amt Issued/Outstanding USD 1,000,000.00 (M) / USD 1,000,000.00 (M), Min Piece/Increment 200,000.00 / 1,000.00, Par Amount 1,000.00, Book Runner BCLY-sole, Reporting TRACE

Exercise 1

BACR 0 08/10/21 Corp Settings - Yield and Spread Analysis

103.956/104.094 Bid/Ask Price 78.282/78.282 BMRK @ 16:02 95) Buy 96) Sell

1) Yield & Spread 2) Yields 3) Graphs 4) Pricing 5) Description 6) Custom

BACR Float 08/10/21 (06738EAR6)

Price	104.094	Settle	06/06/18	M/M Equiv to Next Fix	
DM (bp)	78.28247	to Wst		• ACT/360 • ACT/365	
Yield	3.100635			Price at Refix	103.84044
Workout	08/10/21	@	100.00	on 08/10/2018	65 Days
SFL	87.353			Mmkt	2.92851

Date	Rate
05/10/18	4.46250
08/10/18	0.00000

Benchmark	US0003M	Assumed Rt d	2.31781
Quoted Margin	211.00	Coupon	4.4625
Next Pay	08/10/2018	Coupon Freq	Quarterly
		Refix Freq	Quarterly
Index to	08/10/2018		2.145685 d

	To 08/10/18	OAS
Mod Duration	0.186	2.910
Risk	0.195	3.039
Convexity	0.000695	0.102865
DV 01 on 1MM	19	304

1) Floater Analysis | YASN »

OAS	78.2	Option Premi...	0
Discount Cur...	S23	USD (30/360, S/A vs....	
Forward Curve	S23	USD (30/360, S/A vs....	
Curve Shift (bp)	0	Z-Spread	76.5
Vol Cube	VCUB		
Fixed Equivalent Yield	08/10/21		3.599

Face	1,000 M
Principal	1,040,940.00
Accrued (27 Days)	3,346.88
Total (USD)	1,044,286.88

Exercise 1



Essential reading for Lecture 6:

1. Buckle, M. and E. Beccalli Principles of banking and finance (UOL study guide) **pp. 26-30 (excluding The term structure of interest rates), 32-36, 150-151**
2. Brealey, Myers and Allen. Principles of Corporate finance. **Chapter 3**
3. Mishkin, F. and S. Eakins Financial Markets and Institutions. (Addison Wesley) **Chapter 12**