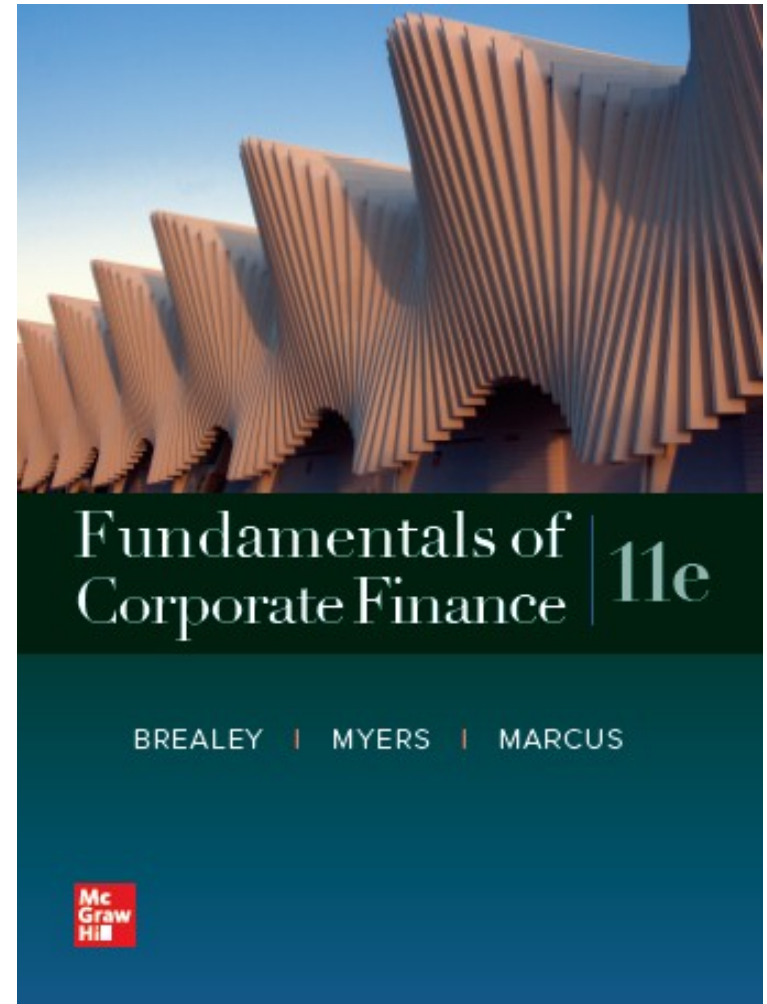# Fundamentals of Corporate Finance, 11th Edition

CHAPTER 6: Valuing Bonds

Model for r_C

r_C = Risk-Free Rate + Maturity Risk Premium + Default Risk Premium

$$r_C = r_f + r_{mp} + r_{dp}$$

Default Risk

| Moody's	Standard & Poor's	Safety
Aaa	AAA	The strongest rating; ability to repay interest and principal is very strong
Aa	AA	Very strong likelihood that interest and principal will be repaid
A	A	Strong ability to repay, but some vulnerability to changes in circumstances
Baa	BBB	Adequate capacity to repay; more vulnerability to changes in economic circumstances
Ba	BB	Considerable uncertainty about ability to repay
B	B	Likelihood of interest and principal payments over sustained periods is questionable
Caa	CCC	Bonds in the Caa/CCC and Ca/CC classes may already be in default or in danger of imminent default
Ca	CC	
C	C	C-rated bonds offer little prospect for interest or principal on the debt ever to be repaid

Ratings

What affects the Rating? What do the Ratings Agencies review?
-Quality of the Company
-State of the Economy
-Bond-specific issues such as:

> -Are there strong financial covenants in the Bond contract?
> -Is there collateral supporting the debt? Is the collateral of value?
> -Are the bonds senior or junior to other debt? Are the bonds "subordinated" to other debt?

The Yield Curve

Treasury securities and Corporate debt securities, YTM returns plotted against maturity
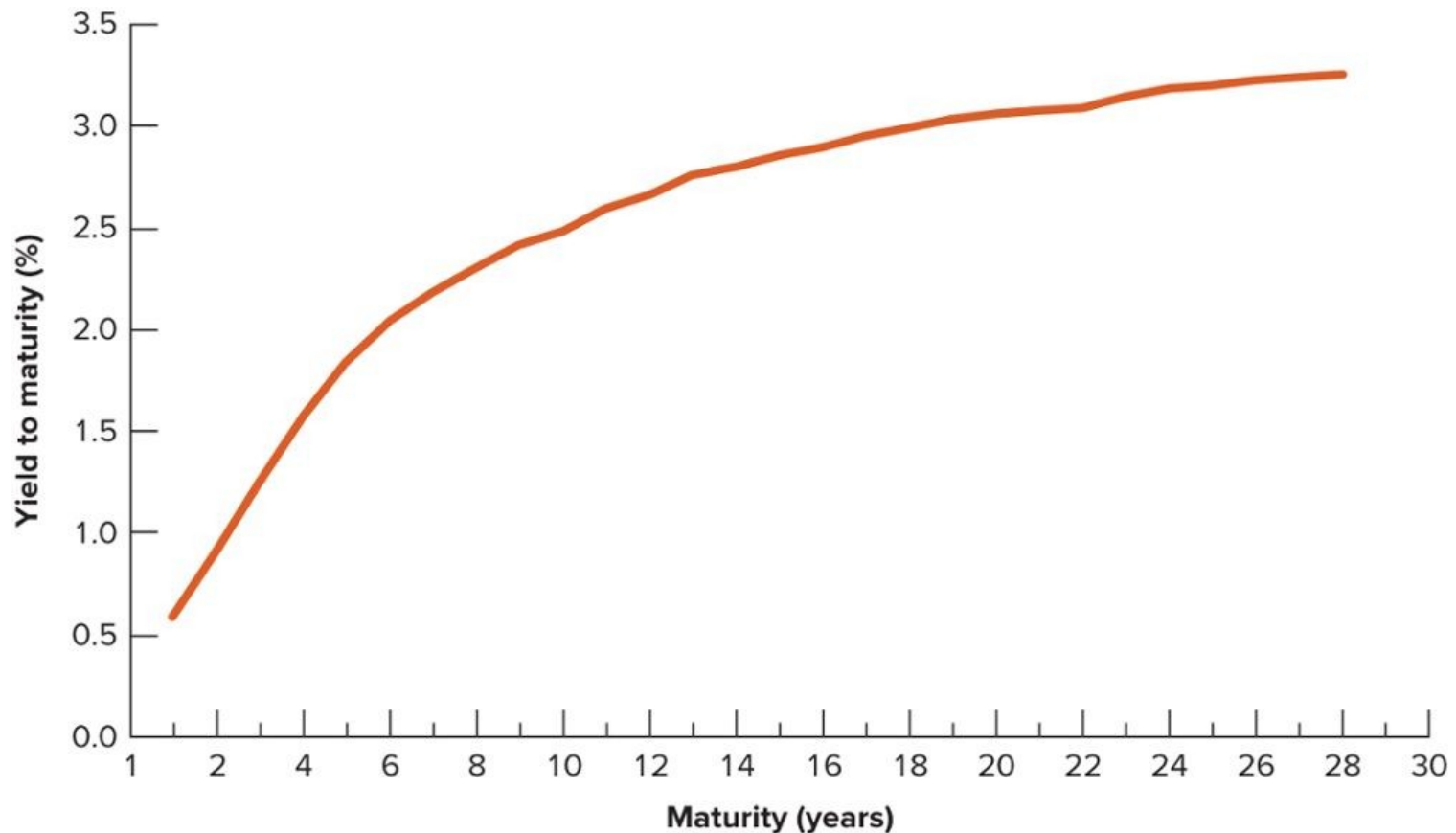
Bond Table (from the Market)

Security	Maturity	Coupon Rate	Face Value	Price	YTM
Treasury Bill	1 year	0.00%	$1,000	$994.53	?
Treasury Note	5-year	2.00%	$1,000	$1,009.48	?
Corp. X (BBB)	5-year	2.80%	$1,000	$979.54	?
Treasury Bond	10-year	2.30%	$1,000	$986.84	?
Corp. Y (AA)	10-year	3.25%	$1,000	$1,012.73	?
Treasury Bond	18-year	2.75%	$1,000	$979.19	?
Corp. Z (A)	18-year	3.50%	$1,000	$955.15	?

Calculate YTM

Examples: using RATE function

5-year Treasury
5 NPER 20 PMT -1,009.48 PV 1,000 FV

18-year Corporate
18 NPER 35 PMT -955.15 PV 1,000 FV

Bond Table (from the Market)

Security	Maturity	Coupon Rate	Face Value	Price	YTM
Treasury Bill	1 year	0.00%	$1,000	$994.53	*0.55%*
Treasury Note	5-year	2.00%	$1,000	$1,009.48	*1.80%*
Corp. X (BBB)	5-year	2.80%	$1,000	$979.54	*3.25%*
Treasury Bond	10-year	2.30%	$1,000	$986.84	*2.45%*
Corp. Y (AA)	10-year	3.25%	$1,000	$1,012.73	*3.10%*
Treasury Bond	18-year	2.75%	$1,000	$979.19	*2.90%*
Corp. Z (A)	18-year	3.50%	$1,000	$955.15	*3.85%*

Calculate Maturity Risk Premiums

Compare Treasury yields to Risk-Free Rate

<u>5-year:</u> 1.80 – 0.55 = 1.25 = 5-year Maturity Risk Premium

<u>10-year:</u> 2.45 – 0.55 = 1.90 = 10-year Maturity Risk Premium

<u>18-year:</u> 2.90 – 0.55 = 2.35 = 18-year Maturity Risk Premium

Calculate Default Risk Premiums

Compare Corporate yields to Treasury yields of same maturity

5-year Corp X vs. 5-year Treasury:
3.25 – 1.80 = 1.45 =
BBB Default Risk Premium

10-year Corp Y vs. 10-year Treasury:
3.10 – 2.45 = 0.65 =
AA Default Risk Premium

18-year Corp Z vs. 18-year Treasury:
3.85 – 2.90 = 0.95 =
A Default Risk Premium

Summary of Bond Market analysis

	r_f	r_{mp}	r_{dp}
Risk-free Rate	0.55%		
5-yr Maturity Risk Premium		1.25%	
10-yr Maturity Risk Premium		1.90%	
18-year Maturity Risk Premium		2.35%	
AA Default Risk Premium			0.65%
A Default Risk Premium			0.95%
BBB Default Risk Premium			1.45%

Apply your model to your investments

$$r_C = r_f + r_{mp} + r_{dp}$$

You are considering investing in a 10-year A-rated Bond with a Face Value of $1,000 and a Coupon Rate of 3.15%. What price should you pay for the Bond?

(NOTE: in your table, you do not have a 10-year A Bond, but it does not matter because you have all the components)

From your Market analysis

$$r_C = r_f + r_{mp} + r_{dp}$$

$$r_{10, A} = 0.55 + 1.90 + 0.95 = 3.40\%$$

What price would you pay for the Bond so that you earn r = 3.40%?

PV function
.034 RATE 10 NPER 31.50 PMT 1000 FV
$979.10

Market Theory
Supply & Demand

What should you do if the Market Price (P_0) is $985? What will other investors do?

What should you do if the Market Price (P_0) is $975? What will other investors do?

Investment Analysis

You can do same analysis if you calculate the YTMs from above prices and compare to r.
RATE function

10 NPER 31.50 PMT -985 PV 1000 FV
Implied return is 3.33%, but r = 3.40%

Bond is overpriced at $985

Investment Analysis

10 NPER 31.50 PMT -975 PV 1000 FV

Implied return is 3.45%, but r = 3.40%

Bond is underpriced at $975

Downgrade?

What would happen to the price ($979.10) of the bond if that A-rated bond was downgraded to a BBB?

The difference in r_{dp} from A to BBB is 1.45 - .95 = .50, so r would increase from 3.40% to 3.90% and price would drop to

.0390 RATE 10 NPER 31.50 PMT 1000 FV

$938.86