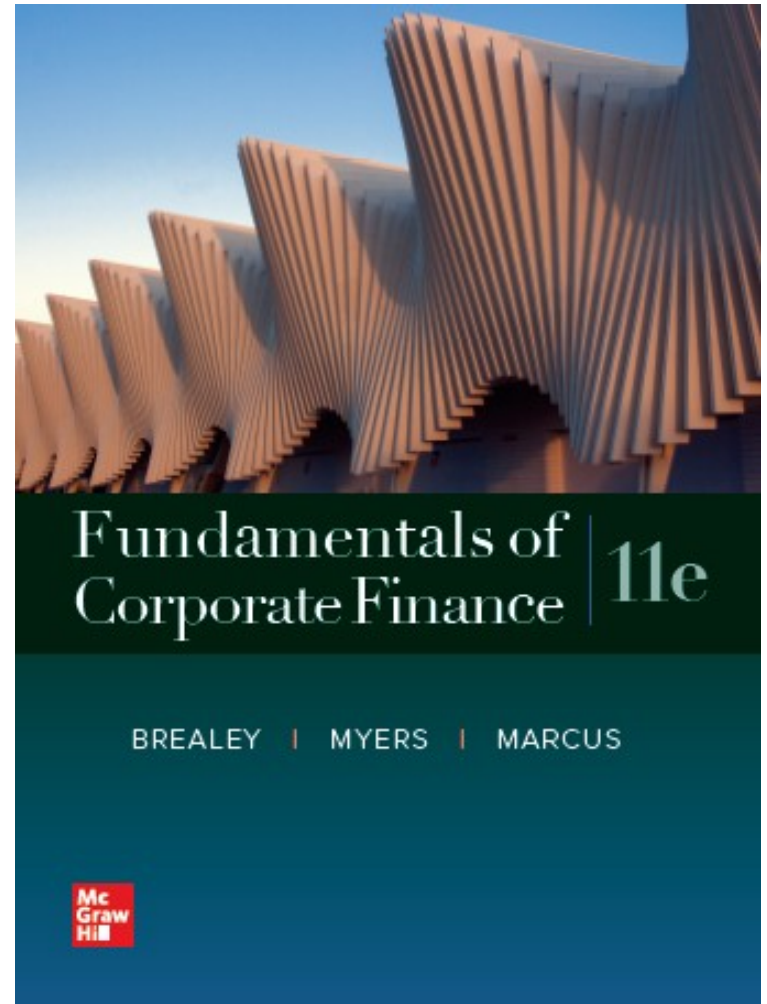


Fundamentals of Corporate Finance, 11th Edition

CHAPTER 6: Valuing Bonds

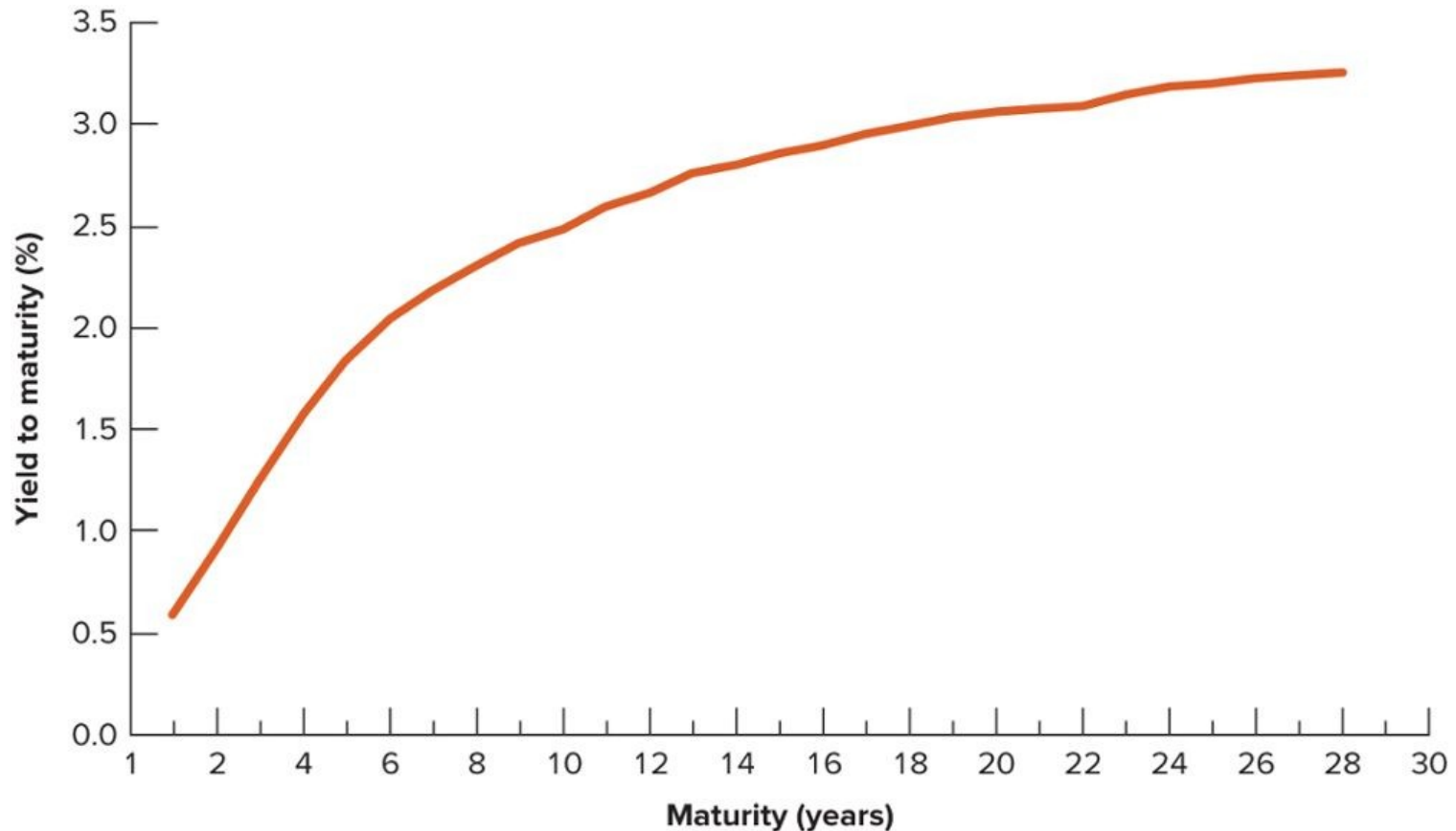


The Yield Curve (1 of 2)

- Term Structure of Interest Rates
 - A listing of bond maturity dates and the interest rates that correspond with each date
- Yield Curve
 - Plot of relationship between bond yields to maturity and time to maturity (generally upward sloping because longer maturities pose greater Interest Rate Risk)

The Yield Curve (2 of 2)

Treasury strips are bonds that make a single payment. The yields on Treasury strips in November 2015 show that investors received a higher yield on longer term bonds.



Interest Rate Risk and Yields

- Example using Yield Curve
 - 1 Year Yield To Maturity (r) 0.5%
 - 5 Year YTM 1.5%
 - 10 Year YTM 2.4%
- All are Treasury Securities, so....
 - the only difference in risk is the maturity
 - remember, assumption is no Default Risk

Interest Rate Risk and Yields

- Example using Yield Curve
 - 1 Year YTM (r) 0.5%
 - 5 Year YTM 1.5%
 - 10 Year YTM 2.4%
- Our model will call the 1 Year Yield the Risk-Free Rate (r_f)

Interest Rate Risk and Yields

- Example using Yield Curve
 - 1 Year YTM (r) 0.5%
 - 5 Year YTM 1.5%
 - 10 Year YTM 2.4%
- 5 Year Maturity Risk Premium (r_{mp}):
 - $1.5\% - 0.5\% = 1\%$
 - Market needs additional 1% to go 5 years

Interest Rate Risk and Yields

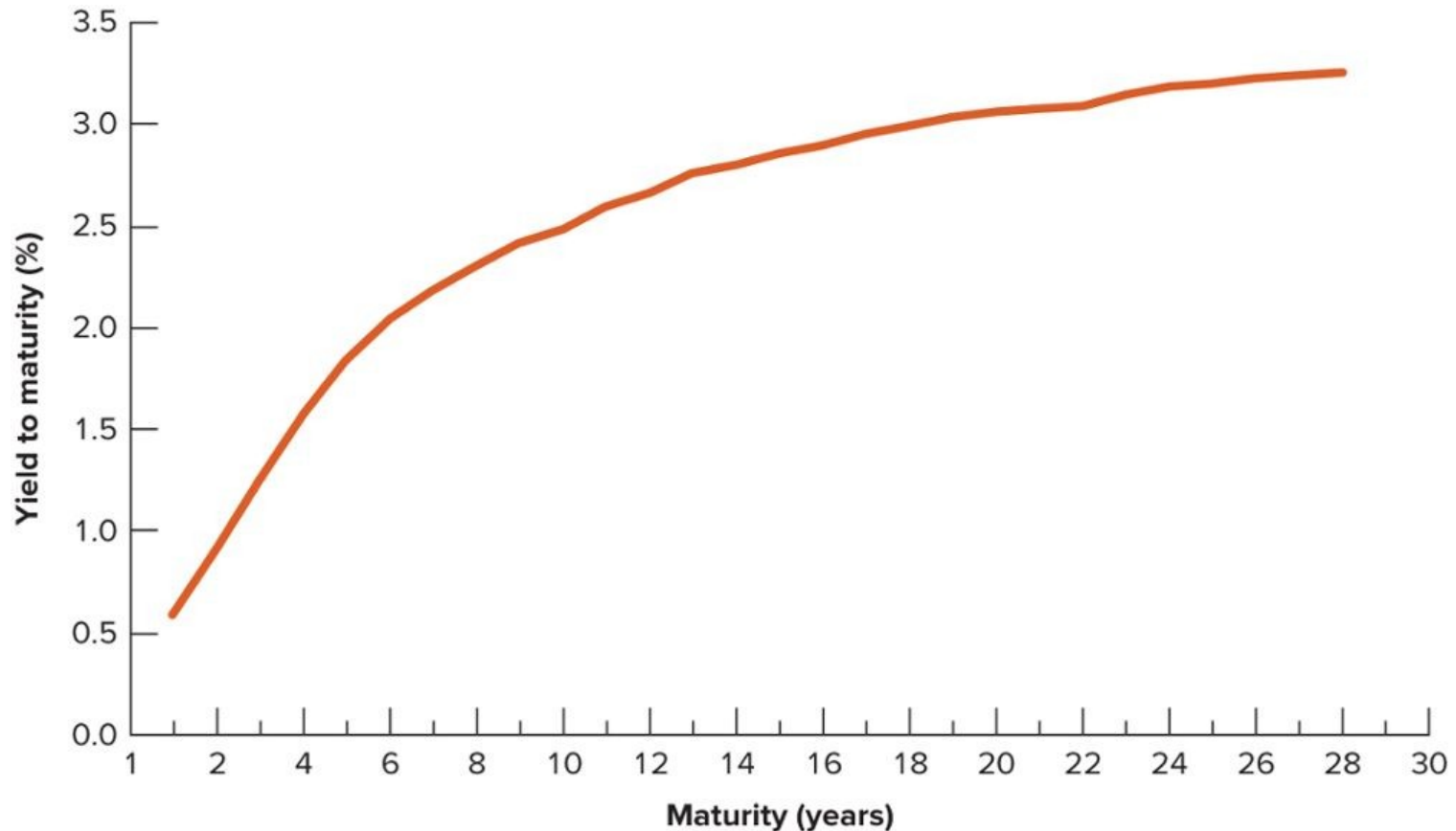
- Example using Yield Curve
 - 1 Year YTM (r) 0.5%
 - 5 Year YTM 1.5%
 - 10 Year YTM 2.4%
- 10 Year Maturity Risk Premium (r_{mp}):
 - $2.4\% - 0.5\% = 1.9\%$
 - Market needs additional 1.9% to go 10 years

Interest Rate Risk and Yields

- Yield Curve
 - 1 Year YTM (r) 0.5% r_{mp} 0.00%
 - 5 Year YTM 1.5% r_{mp} 1.00%
 - 10 Year YTM 2.4% r_{mp} 1.90%
- Greater the maturity, greater the Interest Rate Risk, higher the risk premium
- Upward sloping Yield Curve

The Yield Curve

Treasury strips are bonds that make a single payment. The yields on Treasury strips in November 2015 show that investors received a higher yield on longer term bonds.



Our model for Treasury r

- r_T = Risk-Free Rate + Maturity Risk Premium
- $r_T = r_f + r_{mp}$
- Now you can calculate r on your own
(for Treasury securities)

Corporate Debt

Think of the best company in the world: let's say Apple Computer

Think of the worst company in the world: let's say Sears-Kmart

What is the one thing they have in common?

Corporate Debt

They both MIGHT default on their debt

But, as assumed before, the U.S. Government won't ever, for any maturity, default on its debt

Corporate Debt

So, therefore, what is the one difference in RISK between Treasury Debt and Corporate Debt?

Default Risk

And what do investors do with Risk?

Require a Risk Premium

Model for r_C

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

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

Model for r_C

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

Or, alternately,

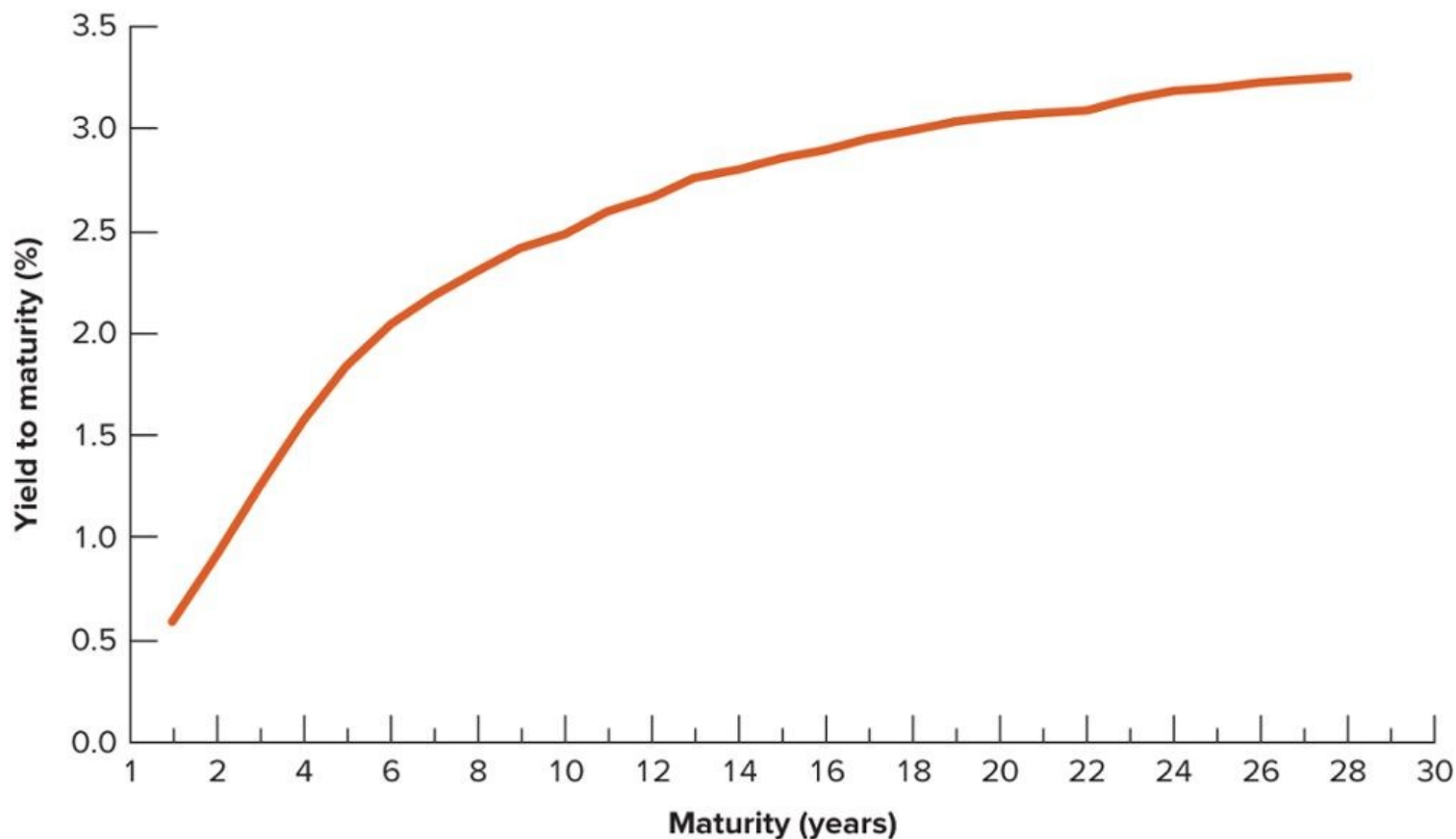
$$r_{C,x} = r_{T,x} + r_{dp}$$

(x denotes maturity)

Find a Treasury of identical maturity and add the Default Risk Premium

Model for r_c

Treasury securities and Corporate debt securities, YTM returns plotted against maturity



Model for r_C

$$r_{C,x} = r_{T,x} + r_{dp}$$

Compare Corp X Bond to 5-year Treasury; compare Corp Y Bond to 10-year Treasury; compare Corp Z Bond to 18-year Treasury

The difference in yields? Since the maturities match, it must be due to Default Risk

The Market needs a Default Risk Premium

Model for r_C

$$r_{C,x} = r_{T,x} + r_{dp}$$

Example: 5-year Treasury has a current Yield-To-Maturity of 1.5%, while a 5-year Corporate Bond (rated BBB) has a current YTM of 3.6%

Why are the yields different?

Default Risk

What is the BBB r_{dp} ? $3.6\% - 1.5\% =$
 2.1%

Model for r_c

Now bring it all together: what price should you pay for a 10-year Corporate Bond with a coupon rate of 4.60% and a rating of BBB?

Step One: What return (“ r ”) do you need?

Step Two: Use that required return (“ r ”) to discount the Bond’s cash flows.

Model for r_c

Step One: What return (“ r ”) do you need?

Risk-Free Rate (r_f) 0.50%

10-Yr Maturity Risk Premium (r_{mp-10}) 1.90%

BBB Default Risk Premium (r_{dp-BBB}) 2.10%

$$r = 0.50\% + 1.90\% + 2.10\% = 4.50\%$$

Model for r_c

Step Two: Use that required return (“ r ”) to discount the Bond’s cash flows.

					1,000
	46	46	46	46
0	1	2	3	10

$r = 4.50\%$

$P_0?$

$P_0 = \$1,007.91$ *see Excel*