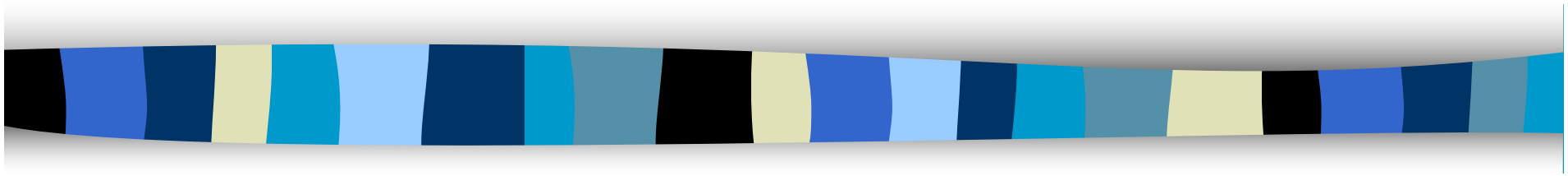
Chapter 10



Bonds and Stocks: Characteristics and Valuation

Learning Objectives

- **LO 10.1 Identify the major sources of external long-term financing for corporations.**
- **LO 10.2 Describe the global market for bonds, the role of bond covenants and bond ratings.**
- **LO 10.3 Compare characteristics of corporate bonds with respect to bondholder security, time to maturity, and income return.**
- **LO 10.4 Describe major characteristics of preferred stock and common stock.**

Learning Objectives

- **LO 10.5 Describe the process for issuing dividends by a firm and differences between cash dividends, stock dividends, and share repurchases.**
- **LO 10.6 Explain how financial securities are valued in general**
- **LO 10.7 Explain how bonds are valued**
- **LO 10.8 Explain how stocks are valued and the economic and industry influences that can affect stock prices.**

LO 10.1 Long-term Financing Sources for Business

- Real assets vs financial assets
- Real assets: physical items that have value in and of themselves—examples include buildings, equipment, real estate as well as oil and precious metals

Long-term Financing Sources for Business

- What is a financial asset?
- A claim against the income or assets of an individual, business, or government.
- Examples:
  - Shares of stock
  - Home Mortgage
  - Car Loan

Long-term Financing Sources for Business

- What is the connection between real and financial assets?
- Financial assets can finance the purchase of real assets. Examples:

Real Asset	Financial Asset
Home, land	Mortgage
Business growth	Bonds, stocks
Car	Car loan
Business start-up	Owner's equity—use own funds to begin business

Long-term Financing Sources for Business

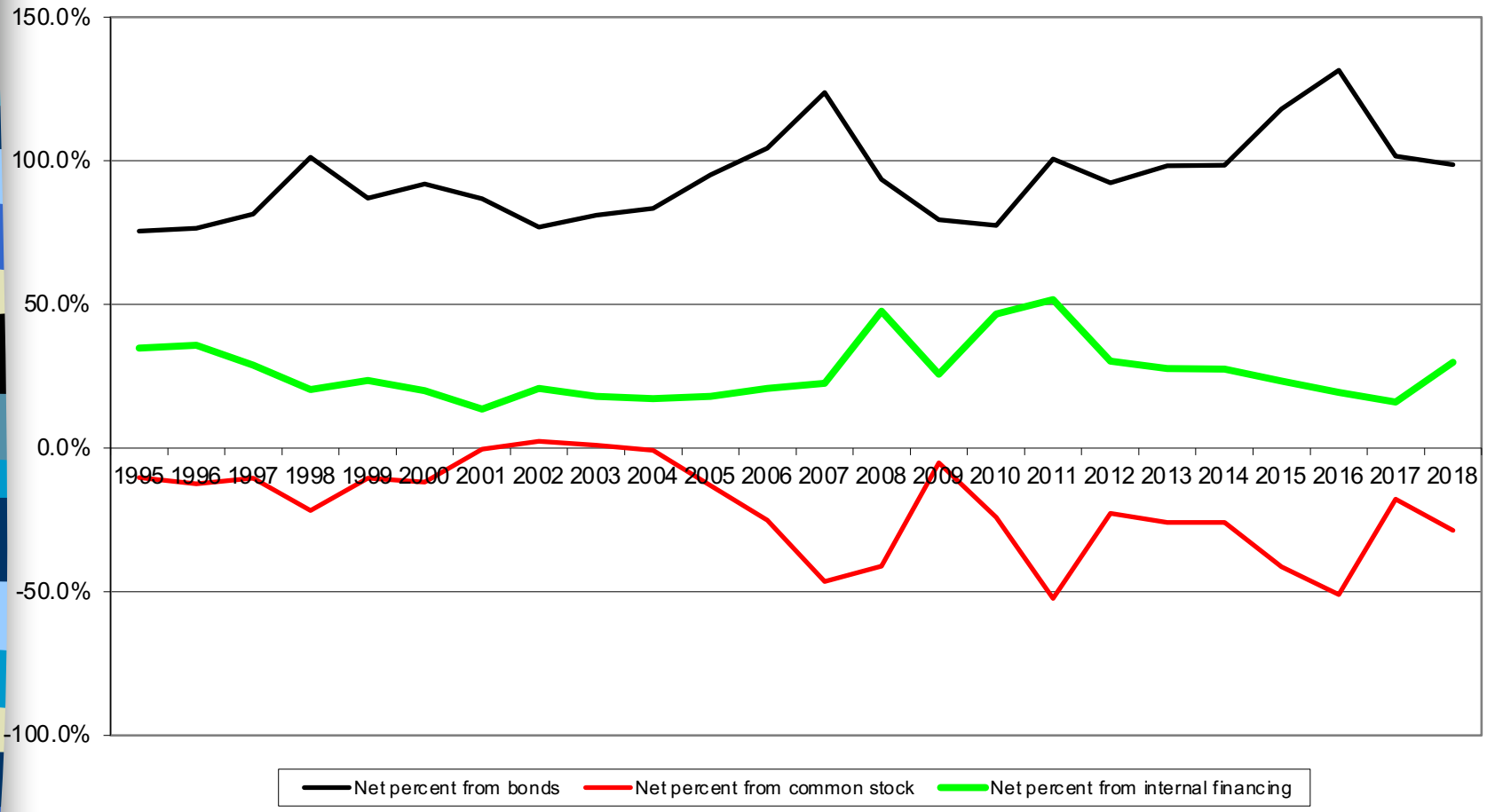
New security issues	2017	2018
Corp Bonds	92.6%	92.0%
Corp Stocks	7.4%	8.0%
Bonds		
Public	94.9%	97.9%
Sold abroad	5.1%	2.1%

Net Long-term Financing Sources for Business

	2017	2018
Bonds	101.7%	98.8%
Common Stock	-17.7%	-28.6%
Internal Financing	16.1%	29.8%

Financing Trend

Figure 10.1 Net Percent of Financing from Bonds, New Stock Issues, and Retained Earnings, 1995-2018



As we see, in addition to retained earnings, businesses can raise funds by:

- Selling shares (external equity)
- Issue debt (bonds)
- Funds can be raised publicly or privately

History Shows….

- Internal/external financing varies over the business cycle
- Common stock is a major source of external equity
- Bonds are a major source of long-term external financing
  - –cheaper than equity
  - –bonds mature

And Overseas Financing Has Risen Over Time...

- More real assets are overseas for U.S.-based firms
- At times, financing costs are lower overseas
- No costly SEC process
- Large issue sizes require a global marketplace

LO 10.2 Bonds

- A contract between borrower/lender
- Bankruptcy/reorganization threat if contract is violated
- Priority claim on assets, cash flow
- Less return potential than equity
- Little/no voice in management

General Terms Associated with Debt:

- Public versus private debt issues
- Some forms of debt capital:
  - Bonds
  - Bank loans
  - Commerical finance company loans

General Terms Associated with Debt:

- Par value or Face Value
- Coupon Rate
- Coupon Payment

  Annual coupon = coupon rate x par value

  U.S. versus Eurobonds
- Secured versus unsecured
- Registered versus Bearer bonds

Bond Covenants

- Impose restrictions or extra duties on the firm
- Protect bondholder stake in the firm
- Indenture and the role of the trustees

Bond Rating Examples

MOODY'S	STANDARD & POOR'S	FITCH	
Aaa	AAA	AAA	Best quality, least credit risk
Aa1	AA+	AA+	High quality, slightly more risk
Aa2	AA	AA	than a top-rated bond
Aa3	AA–	AA-	
A1	A+	A+	Upper-medium grade, possible future
A2	A	A	credit quality difficulties
A3	A–	A-	
Baa1	BBB+	BBB+	Medium quality bonds
Baa2	BBB	BBB	
Baa3	BBB–		

High-Yield or Junk Bonds

MOODY'S	STANDARD & POOR'S	FITCH	
Ba1	BB+	BB+	Speculative issues, greater
Ba2	BB	BB	credit risk
Ba3	BB–	BB-	
B1	B+	B+	Very speculative, likelihood of
B2	B	B	future default
B3	B–	B-	
Caa	CCC	CCC	Highly speculative, either in
Ca	CC	CC	or high likelihood of going
C	C	C	into default
	D	DDD	
		DD	
		D	

Bond Ratings

- Measure likelihood of default; influenced by level of issuer's cash flow, investor protection in the covenants
- Acts as a market signal
- Lower rating→Higher risk→Higher coupon rate on new issues

Global Bond Market

- Eurodollar bonds
- Yankee bonds
- Global bonds

Reading Bond Quotes: Example

Company (Ticker)	Coupon	Maturity
Ford Motor Credit (F)	7.000	Oct. 1, 2027

Last Price	Last Yield	EST. Spread	UST	EST.$ VOL (000s)
117.26	3.76	236	5	230,068

Reading Bond Quotes

Treasury example:

Rate	Maturity Mo/Yr	Bid	Asked	Chg.	Asked Yld.
4.000	Feb 27	100:27	100:28	-1	1.95

LO 10.3 Different Types of Bonds Security, Maturity, Income Differences

Mortgage Bond

- **Equipment Trust Certificate**
- **Debentures**
- **Subordinated Debentures**

Security Features, continued

- **Securitization**
  - Collateralized Bond (e.g., CMO)
  - Home mortgages
  - Credit card receivables
  - Auto loans
  - Royalties for music/film/TV rights

Time to Maturity

- U.S.: 10-to-30 years (typical)
- Eurobond: 7-to-10 year (typical)
- Convertible bonds
- Callable bonds
- Putable bonds
- Extendable bonds
- Sinking fund

Income from Bonds

- U.S.: Semi-annual
- Eurobond: Annual
- Fixed (usual case)
- Variable
  - Base rate + premium
  - Percentage of Base
  - Tied to bond rating
- Zero coupon bond
- Inflation protection (TIPS)

LO 10.4 Corporate Equity Capital

- Represents ownership
- Certificate versus street name

Common Stock

- Owners of the firm
- Select Directors
- Dividends: when declared
- Lowest priority in bankruptcy
- Par value--meaningless
- Different classes to protect control

Preferred Stock

- "Preferred" over common stock with a senior claim on earnings, assets
- Fixed dividend; par value is important!
- Usually non-voting

Other Features

- Cumulative versus non-cumulative
- Callable
- Convertible
- Tax Advantage

Reading a Stock Quote

YTD	52 weeks				
% chg	Hi	Lo	Stock	Sym	Div
+4.4	42.75	26.72	Wendy's	WEN	0.48

Yld		Vol		Net
%	PE	100s	Close	chg
1.2	20	10,329	40.95	-0.07

LO 10.5 Dividends And Stock Repurchases

- In addition to stock market price fluctuations, a firm can give returns to its shareholders in two ways:
- Dividends
- Stock repurchases

How Do Firms Decide How Much to Pay in Dividends?

- Important influences:
- Ability of firm to generate cash to sustain level of dividends
- Legal/contractual considerations (par value, bond indenture)
- Growth opportunities facing firm
- Cost of other financing sources
- Tax rates on dividend income

Stock Dividends

- **Stock Dividend**
  - **Dividend paid with shares of stock rather than cash**
- **Net effect on shareholder wealth: 0**

Stock Dividends

- If number of shares increases, stock price will decline so that:
- New price x new number of shares = old price x old number of shares
- 100,000 shares are $10/share➔firm value is $1 million. Firm distributes a 10% stock dividend
- Now there are 110,000 shares outstanding;
- New price

  = $1,000,000 (firm value)/110,000 shares = $9.09
- You may own 10% more shares but price of each is 10% lower. Net effect: no change in wealth!

Stock Split

- Firm distributes extra shares for every share owned
- 2-for-1 split: for every share owned, you receive another share. If you owned 100 shares you now own 200.
- But stock price will adjust so shareholder wealth is constant
- Reverse split: 1-for-2: number of shares cut in half—you owned 200 shares, now you own only 100 shares. Share price adjusts so change in wealth = 0.

Stock Dividends/Split

- Both involve accounting entries, no impact on shareholder wealth
- Distribution of 5-for-4 is a “split” (25% stock dividend or more)
- Distribution of less than 5-for-4 is a “dividend” (less than a 25% stock dividend)

Why Offer Stock Splits/Dividends?

- **Psychological**
  - Investors believe they are getting more
  - Illusion of wealth raising
- **Is there an "optimal" price range for stock?**
  - If so, splits/reverse splits/dividends can move price back toward the desired range.
  - Exceptions: Berkshire Hathaway ($100,000/share) and other firms with prices in excess of $100/share

Share Repurchases

- Why buy back stock?
- Major reasons:
  - Reward long-term shareholders as less shares should increase stock price over time;
  - Firm sees stock as overvalued and as a good investment of excess funds
- Minor reasons:
  - Acquire shares for management incentive stock options
  - Use in acquisitions

LO 10.6 Valuation Principles

Basic concept:

Price of an asset =

Present value of future expected cash flows

In equation form:

- $$\text{price} = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \cdots + \frac{CF_n}{(1+r)^n}$$ **(equation 10.1)**

or

- $$\text{price} = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t}$$ **(equation 10.1a)**

- $$\text{price} = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} \quad \text{(equation 10.1a)}$$

Inputs: Cash flows CF_t

Discount rate r

Number of time periods n

- These are easier to determine for bonds than for stocks
- Use PV tables, calculator, or spreadsheet functions to solve

LO 10.7 Bond Valuation

- **price= PV (expected future cash flows)**

  = PV (coupon payments) + PV (principal)

- $$\text{price} = \frac{C_1}{(1+r_b)^1} + \frac{C_2}{(1+r_b)^2} + \frac{C_3}{(1+r_b)^3} + \cdots + \frac{C_n}{(1+r_b)^n} + \frac{Par_n}{(1+r_b)^n}$$ **(equation 10-2)**

- **Which is equal to:**

- $$\text{price} = \sum_{t=1}^{n} \frac{C_t}{(1+r_b)^t} + \frac{Par_n}{(1+r_b)^n}$$ **(equation 10-2)**

If coupons are paid semi-annually (twice a year):

- In this case, *r* is the semi-annual discount rate, not an annual discount rate
- YTM (using APR or annual percentage rate format) = *r* x 2
- Rearranging, we can solve for the periodic interest rate *r*:

  r = YTM/2
- n = # of years until maturity x 2

An example

- $1,000 par value, coupon rate 8% paid once per year, 10 years until maturity

- Investors require 8.0% return

Number of periods 2 x 10 = 20

Periodic rate: r = market rate / 2

= 8.0% / 2

= 4%

$40	x	13.590 =	$543.60
$1,000	x	0.456 =	456.00
Bond value		=	$999.60

(not equal to $1000 because of interest factor rounding)

Spreadsheet cells

	A	B	C
1			
2	Computing bond price using APR		
3	Coupon Rate	8.00%	
4	# of yrs 'til maturity	10.00	
5	# of coupons/year	2	
6	Par Value	$1000.00	
7	Market rate	8.00%	APR
8			
9	Compute periodic rate:	4.00%	=B7/B5
10	Compute # of periods:	20.00	=B4*B5
11	Coupon cash flow:	$40.00	=(B3*B6)/B5
12			
13	Bond price	$1,000.00	=-PV(B9,B10,B11,B6,0)

If required return rises to 10.0%:

- $r = 10.0\% / 2 = 5\%$

$40 x 12.462	=	$498.48
$1,000 x 0.377	=	377.00
Bond value	=	$875.48

(discount bond)

- If required return falls to 6.0%:
  Bond value = $1,148.77
  (premium bond)

The Seesaw Effect

- Required rate of return (the market interest rate) rises…bond prices fall

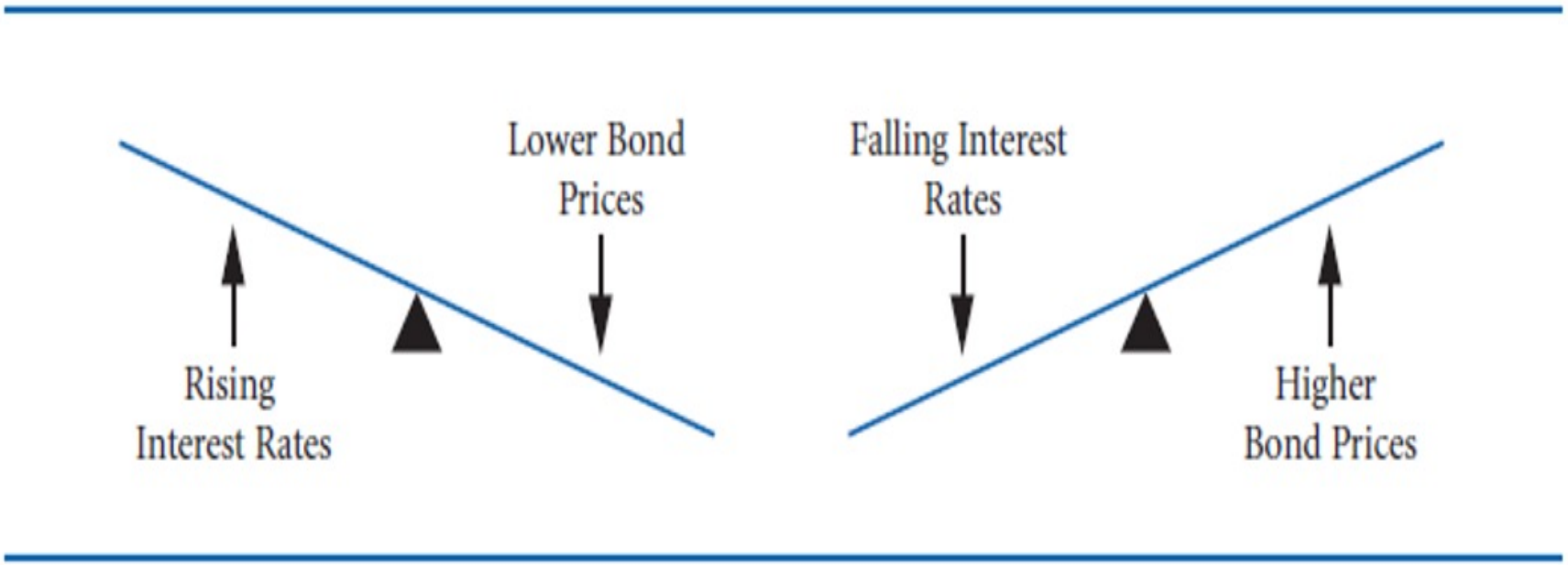
Interest rate = 8.0% price = $1000

Interest rate = 10.0% price = $875.48

- Required rate of return falls, bond prices rise

Interest rate = 6.0% price = $1148.77

The Seesaw Effect



Finding the required return if we know the price...

- **Approximate yield to maturity**

$$= \frac{\text{Annual interest} + (\text{par} - \text{price})/n}{(\text{par} + \text{price}/2)} \qquad (10.3)$$

- **Spreadsheet functions**
- **Financial calculator**

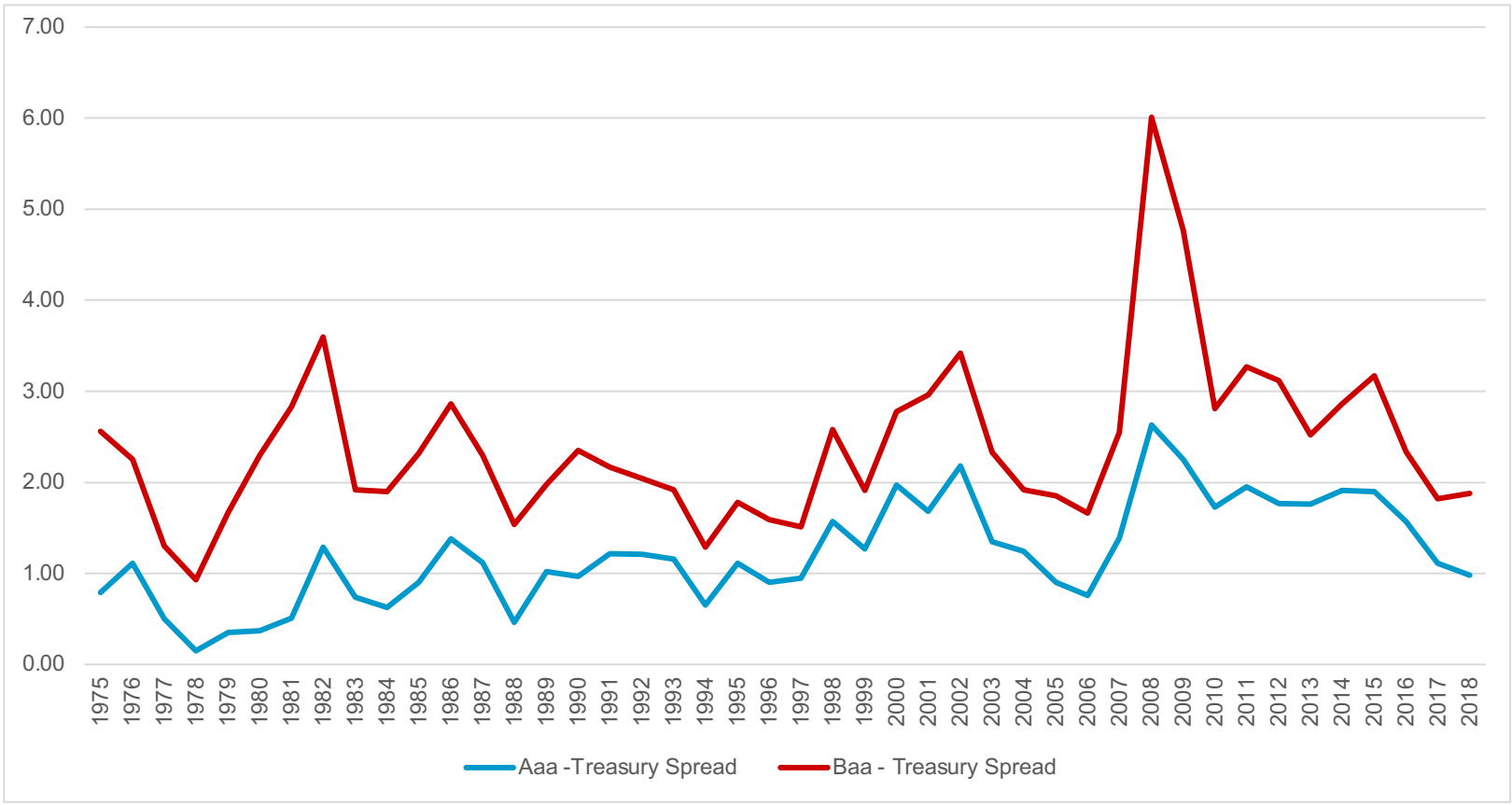
A bond will sell for a higher price if:

- Higher coupons (higher coupon rates)
- More frequent coupon payments (semi-annual vs. annual)
- Lower required rate of return *r*

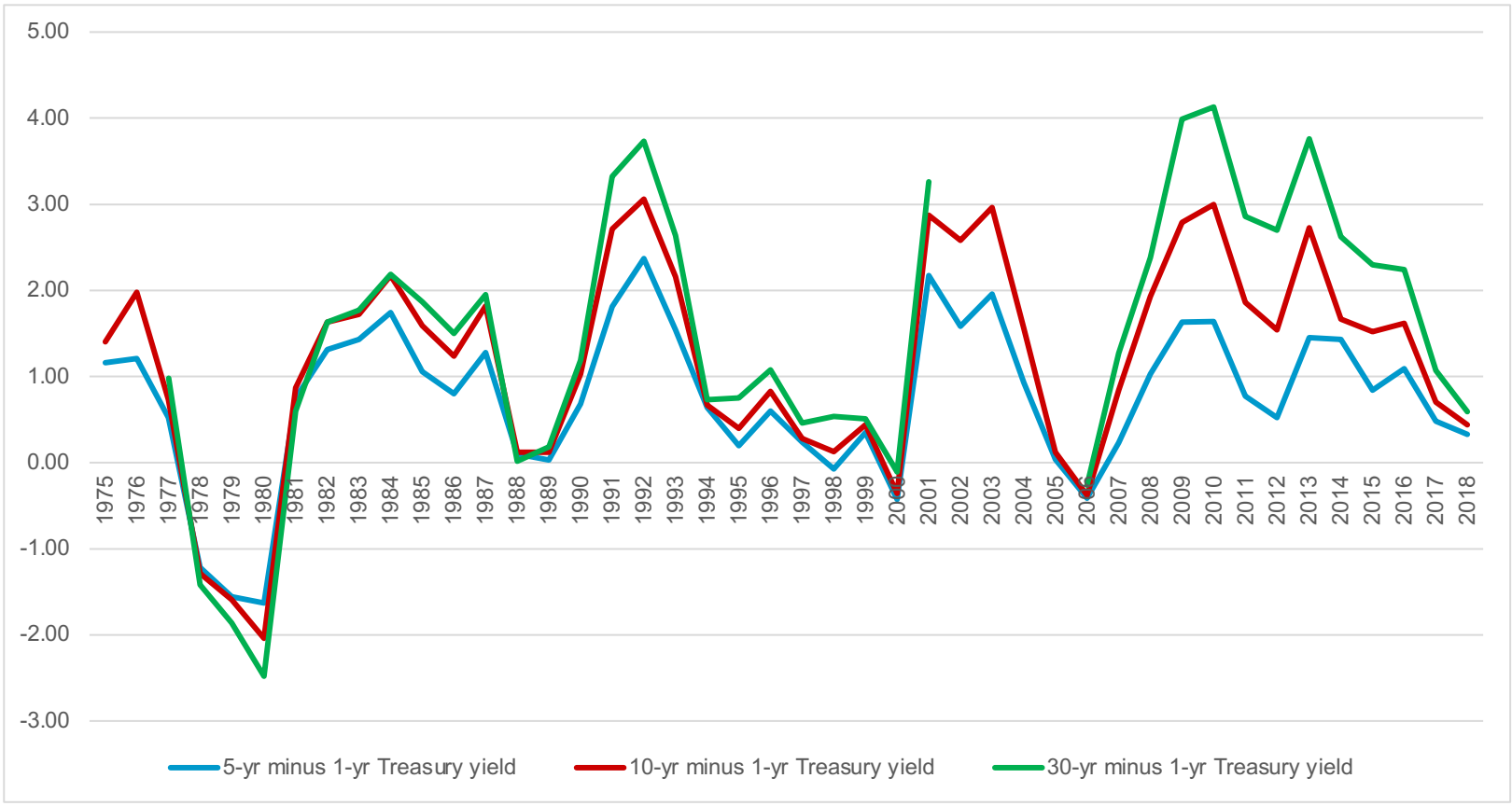
Risks in Bond Investing

- Credit risk (default risk)
- Interest rate risk (seesaw effect)
- Reinvestment rate risk
- Special risks for non-domestic bonds:
- Political risk
- Exchange rate risk

Annual Credit Risk Spreads



Horizon or Time Spreads on Treasury Securities



LO 10.8 Valuation of Stocks

- Same principal:

Price = Present Value of expected future cash flows

But tougher to apply than with bonds:

- indefinite life
- cash flows (dividends) uncertain
- discount rate hard to determine

We handle these difficulties by making simplifying assumptions

- Constant dividends over time (e.g., preferred stock)

- $$P_0 = D_0 / r_s$$

- $$P_0 = \$2.00/0.10 = \$20.00$$

Or constant growth in dividends over time: Gordon or constant dividend growth model

- $P_0 = \frac{D_1}{(r_s - g)}$

- Today's dividend = \$1.89; g = 8.5%;

$r_s = 12\%$

$P_0 = \frac{1.89\,(1+0.085)}{.12 - .085} = \mathbf{\$58.57}$

Spreadsheet Model

	A	B	C
1			
2	Constant growth stock valuation model		
3			
4	Current dividend:	$1.89	
5	Exp div growth:	8.50%	
6	Req'd ROR:	12.00%	
7			
8	Estimated stock price:		
9		$58.59	=B4*(1+B5)/(B6-B5)

Risks in Stock Valuation

- Quality of management's ethics, decisions
- Uncertainty over future dividend changes, growth changes
- Changing market/investor expectations for firms, the economy
- Changing interest rates

Valuation and The Financial Environment

- Economic events affect firms'
  - –Cash flows
  - –Required rates of return
    - Inflation
    - Risk Premium

Global Economic Influences

- Condition of non-domestic economies
  - Exports
  - Imports and domestic competition
- Changes in exchange rates
  - Affects cash flows
  - Affects domestic interest rates

Domestic Economic Influences

- **Consumers affect cash flows**
  - Higher disposable income➔ higher spending
  - ➔higher levels of business production, investment, and hiring
  - ➔economic growth, firm's profitability
- **Economic conditions affect required return**
  - – Inflation
  - – Investor optimism/pessimism on credit spreads, risk premiums

Domestic Economic Influences

- **Government:**
  - **Fiscal policy: affects consumers' disposable income**
  - **Monetary policy: affects interest rates, inflation expectations**

Industry

- Industries are affected differently by changes in economic variables (cyclicals versus consumer staples)
- Level of competition in an industry
- Firm's competitive position and advantage relative to other firms
- Impact of changes in cost, availability of raw materials, labor, energy
- All these affect a firm's cash flows and investors' perceptions of its risk

Learning Extension 10
Annualizing Rates Of Return

- **Dollar return = Income received + price change**
- **Percent return = Dollar return/initial price**
- **Receive $2 in income, buy for $25, sell for $30:**

  Dollar return = $2 + ($30-$25) = $7

  Percent return = $7/$25 = 0.28 or 28%

Annualizing a Return

Annualized return =

$$(1 + \text{percent return})^{1/n} - 1$$

where n is the number of years the asset was held or owned

Two examples: you earn 28% over a holding period

- If the holding period is 2 years:

Annualized return =

$$(1 + .28)^{1/2} - 1 = 13.1 \text{ percent}$$

- If the holding period is 9 months:

Annualized return =

$$(1 + .28)^{1/.75} - 1 = (1.28)^{4/3} - 1$$

$$= 0.389 \text{ or } 38.9 \text{ percent}$$

Web Links

www.federalreserve.gov
www.sec.gov
www.standardandpoors.com
www.moodys.com
www.fitchratings.com
www.investinginbonds.com
www.fool.com
http://finance.yahoo.com
www.zacks.com
www.whispernumber.com
www.morganstanley.com
https://www.whitehouse.gov/wp-content/uploads/2019/03/ERP-2019.pdf
www.stlouisfed.org/
www.hoovers.com

Extra: Two-stage growth model

Two-stage Growth Model

- High-growth period followed by lower, constant growth

1. Estimate dividends during super-normal growth period, years 1-n
2. As constant growth begins in year n+1, find stock price in year n using the Gordon model
3. Sum present values of dividends and price

Two-stage growth example

- Recent dividend=$0.50
- Expected to grow 20% each year for three years
- After year 3, “normal” growth of 7% annually is expected
- Required return = 10%

Two-stage growth example

Estimate dividends in the high-growth period

Year	Dividend
1	(0.50)(1+0.20) = $0.60
2	(0.60)(1+0.20) = $0.72
3	(0.72)(1+0.20) = $0.86

Estimate price in year 3:

$P_3 = D_4/(r-g) = \$0.86(1+.07)/(0.10-0.07)$

$= \$30.67$

Two-stage growth example

- Find the present values of the year 1-3 dividends and year 3 price:

$$P_0 = \$0.60/(1.10) + \$0.72/(1.10)^2 + \$0.86/(1.10)^3 + \$30.67/(1.10)^3$$

$$= \$24.83$$