

-K-K-K-

YBFAs part 2

Corporate Fixed Income, their ratings, yields, and ETFs ...



Topical: IBM buys Redhat (RHT)

.. from last year

Source: *The Wall Street Journal*, Oct. 28, 2018



IBM to Acquire Red Hat for About \$33 Billion

Tech giant's aim is to boost a cloud-computing business central to CEO Rometty's effort to revive the co



Red Hat has grown into the dominant provider of the Linux operating system to corporations. PHOTO: VACLAV SALEK/CTK/ZUMA PRESS

By Jay Greene and Robert McMillan

Updated Oct. 28, 2018 5:28 p.m. ET

96 COMMENTS

[International Business Machines Corp.](#) [IBM](#) -1.64% agreed to buy software-and-services company [Red Hat Inc.](#) [RHT](#) +45.55% for about \$33 billion in its biggest acquisition ever, a deal aimed at helping IBM Chief Executive Ginni Rometty boost a cloud-computing business central to her efforts to revive the tech giant.

IBM rivals [Amazon.com Inc.](#) and [Microsoft Corp.](#) have jumped ahead of it in recent years in the business of providing computing power and software for rent. But Ms. Rometty said in an interview that the market is moving into a second chapter in which customers will want to work with multiple cloud providers. That should boost interest in so-called hybrid services in which companies run programs that use computing resources from their own servers and web services from IBM and others at the same time, she said.

RHT ▾

Calls and Puts ▾

NOV 02 '18
4 DAYS

NOV 09 '18
11 DAYS

NOV 16 '18
18 DAYS

NOV 23 '18
25 DAYS

MORE ▾

CALLS

CHANGE %

VOLUME

OPTN

OPN...

HIGH

LOW

LAST

ASK

SIZE

BID

SIZE

ASK

BID

STRIKE

3,014.29%

2

21

55.30

54.50

54.50

35

55

51.50 ▴

50.60 ▴

119

3,700.00%

5

42

53.20

52.70

53.20

35

55

50.50 ▴

49.60 ▴

120

151

c1.10

36

175

49.50 ▴

48.60 ▴

121

5,817.65%

1

46

50.30

50.30

50.30

36

61

48.50 ▴

47.60 ▴

122

6,900.00%

4

39

50.95

48.25

49.00

36

59

47.50 ▴

46.60 ▴

123

7

65

49.70

46.05

c0.55

35

61

46.50 ▴

45.60 ▴

124

12,300.00%

352

375

49.60

48.35

49.60

35

174

45.50 ▴

44.60 ▴

125

12,500.00%

1

49

44.10

44.10

44.10

35

61

44.50 ▴

43.60 ▴

126

Types of Risk Embodied in the Yields of YBFAs

- **Market risk** (which we have already seen)
 - due to capital gains and losses when interest rates fluctuate
 - the longer the maturity, the higher the risk
 - common to all YBFAs, including Treasuries
- **Default risk**
 - reflected in corporate and municipal YBFAs
 - not present in Treasuries
- **Liquidity risk**
 - reflects the fact that bond markets may not be very liquid, especially in terms of crisis (also applies to bond ETFs)
- **Credit risk**
 - risk that the underlying agency, government, or corporation that has issued the YBFA experiences a downgrade

... and these overlap a lot. A rise in credit risk made evident by a ratings downgrade will also raise default risk and possibly market risk.

Corporate Bonds and Notes (CBNs)

- Major funding source for corporations
- Thousands of listings at every maturity
- Unlike Treasuries, CBNs also subject to **default risk**
- Hence, CBNs are risk-rated by credit agencies
 - primarily **Moody's**, **S&P Global** (Standard and Poors), and **Fitch**
- Ratings and changes in ratings have a large impact upon yields
- Even the highest-rated CBNs have higher yields than Treasuries of equivalent maturities.
- This is a playground only for professionals, except maybe ETPs
- Diversified CBN mutual funds, however, can be a nice supplement to a balanced mutual fund portfolio.

Bond ratings and default risk

S&P Global Ratings	Interpretation	
AAA	Extremely strong, almost no possibility of default.	Investment Grade
AA	Very strong, default extremely unlikely.	
A	Strong, although possibly vulnerable to strong adverse environment.	
BBB	Strong protection parameters, but weak if faced with adverse conditions.	
BB	Vulnerable to uncertainties or any adverse conditions.	High-Yield (also called Junk)
B	Currently able to meet financial commitments, but very vulnerable to adverse conditions.	
CCC	Vulnerable to default, dependent upon favorable conditions to avoid default.	
CC	Default highly likely, although possibly not immediately.	
C	Nearly certain to default with little likelihood of recovery.	
D	In default, or equivalent.	

This is a simplified version of the ratings. See Appendix 4 of chapter 7 for the full listing and explanation.

These are what the book refers to as “long-term issue credit ratings”

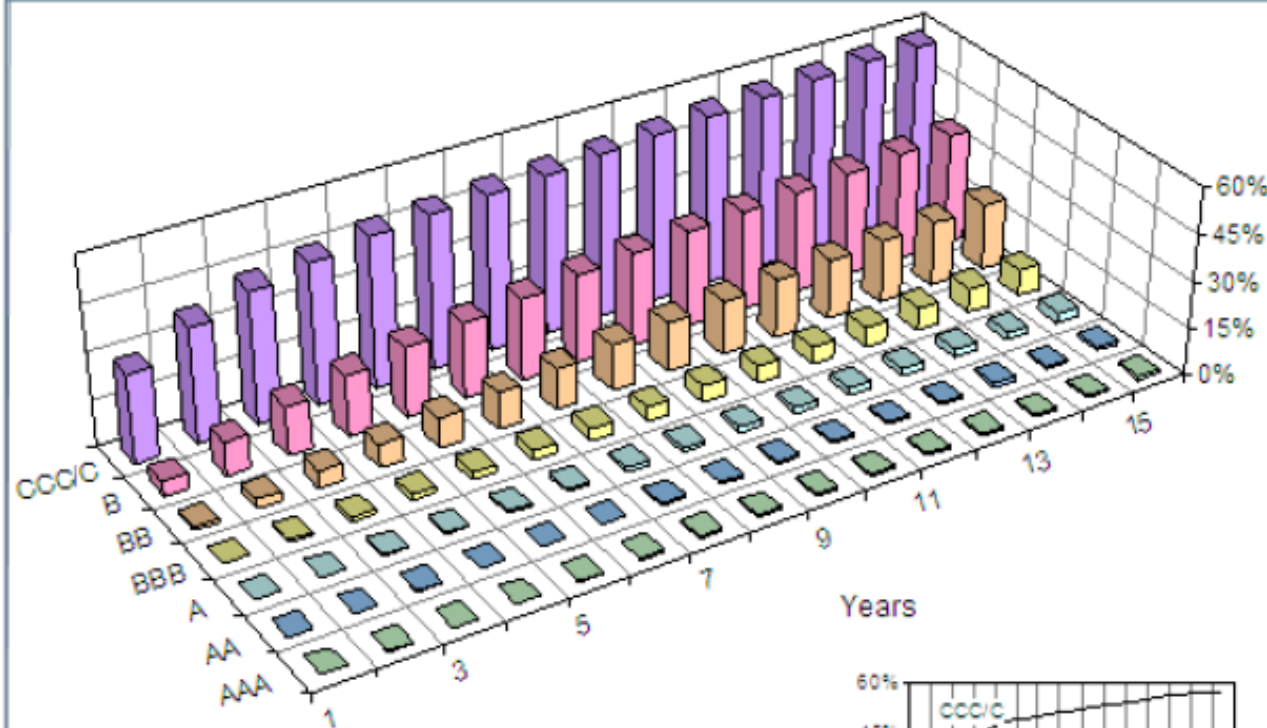
The interpretation is meant to be your teacher's interpretation of the **S&P Global Ratings Definitions**, which are sourced and defined in **Appendix 4**.

Standard & Poor's Estimated Average Cumulative Default Rates for various credit ratings

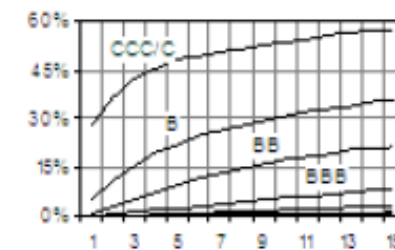
... showing their estimates of the estimated cumulative default rate (e.g. the estimate of a CCC/C junk bond defaulting within 2 years is above 30%, within 7 years is above 45%).

Source: Standard and Poor's Global Fixed Income Research, "*The Time Dimension of Standard & Poor's Credit Ratings*," September 22, 2010, p.3 Chart 1.

Global Corporate Average Cumulative Default Rates (1981 – 2009)



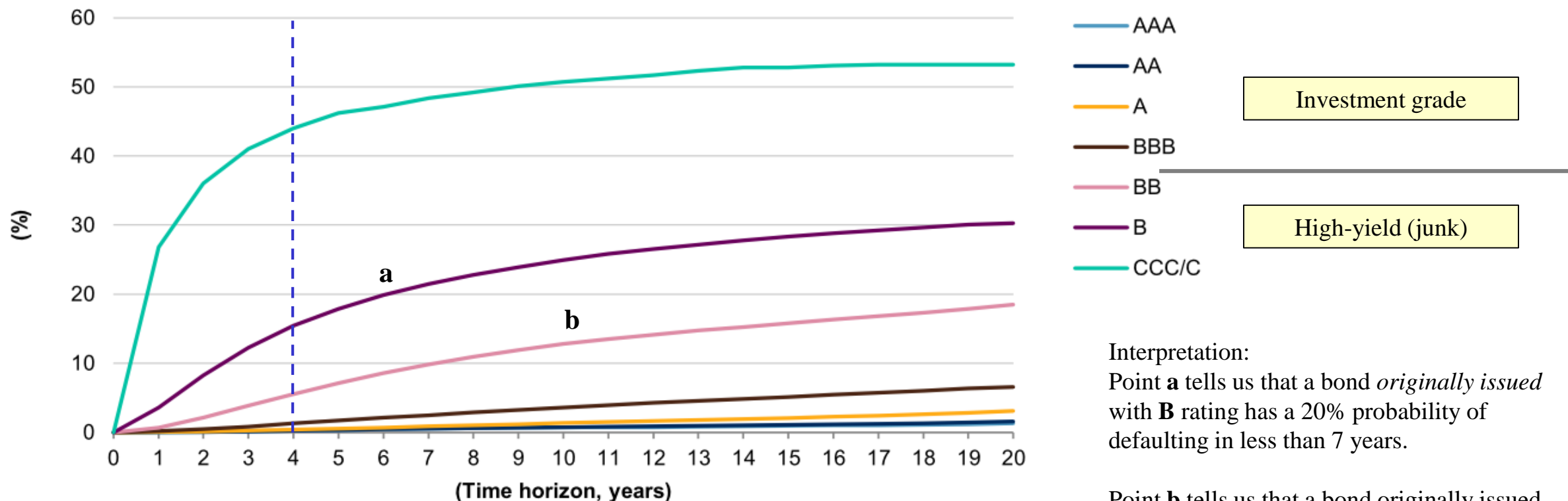
Older slide ... data not relevant now, concept is ...



Source: Standard & Poor's Global Fixed Income Research.

© Standard & Poor's 2010.

U.S. Corporate Bond Average Cumulative Default Rates in Years (1981-2017)



Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

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Interpretation:

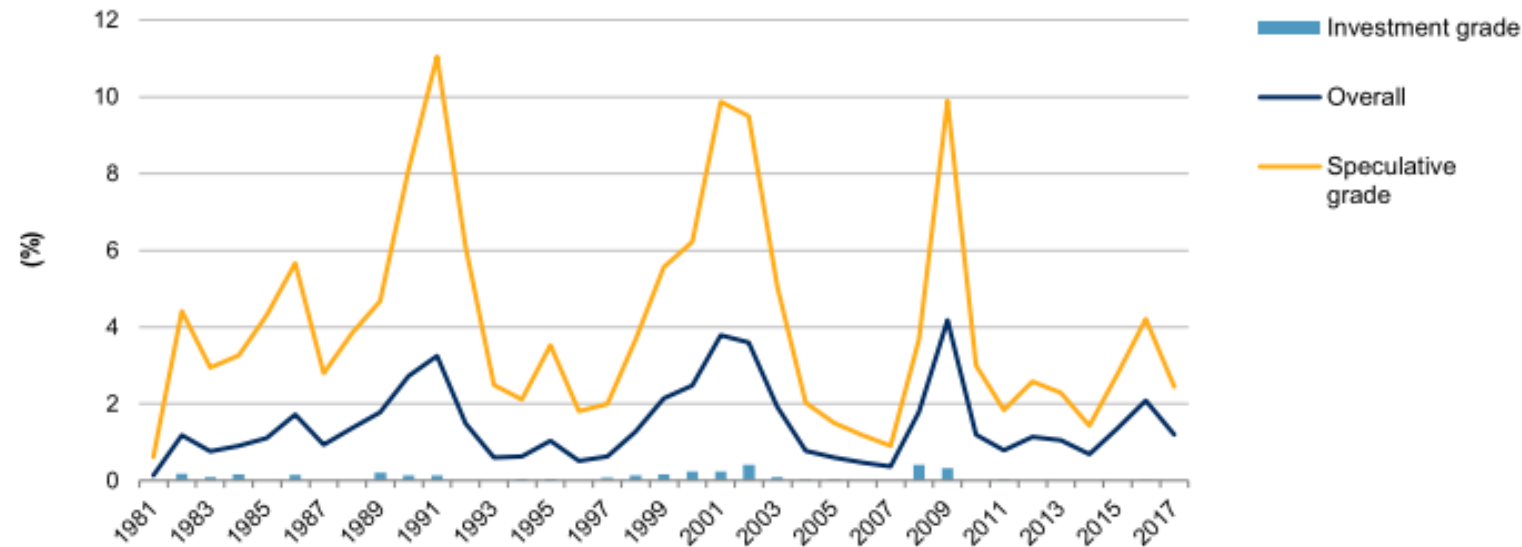
Point **a** tells us that a bond *originally issued* with **B** rating has a 20% probability of defaulting in less than 7 years.

Point **b** tells us that a bond originally issued as a **BB** rating has about a 14% probability of defaulting within 10 years.

A note with only 4 years of life would have probabilities of lifetime default associated with the dashed blue line.

Historical default rates .. different ratings

Global Default Rates: Investment Grade Versus Speculative Grade



Sources: S&P Global Fixed Income Research and S&P Global Market Intelligence's CreditPro®.

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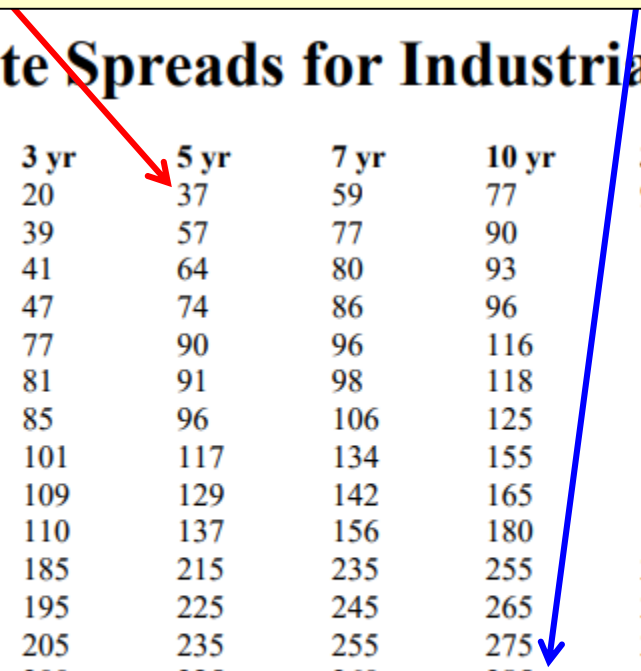
Year	Total defaults*	Investment-grade defaults	Speculative-grade defaults	Default rate (%)	Investment-grade default rate (%)	Speculative-grade default rate (%)	Total debt outstanding (bil. \$)
2012	83	0	66	1.14	0.00	2.58	86.70
2013	81	0	64	1.06	0.00	2.30	97.29
2014	60	0	45	0.69	0.00	1.43	91.55
2015	113	0	94	1.36	0.00	2.76	110.31
2016	163	1	143	2.08	0.03	4.21	239.79
2017	95	0	83	1.20	0.00	2.44	104.57

Same source
as previous
slide.

Figure 12 - Corporate Yields Spreads above U.S. Treasuries of equivalent maturity - March 2013

This shows spread above underlying Treasury Issue in basis points.

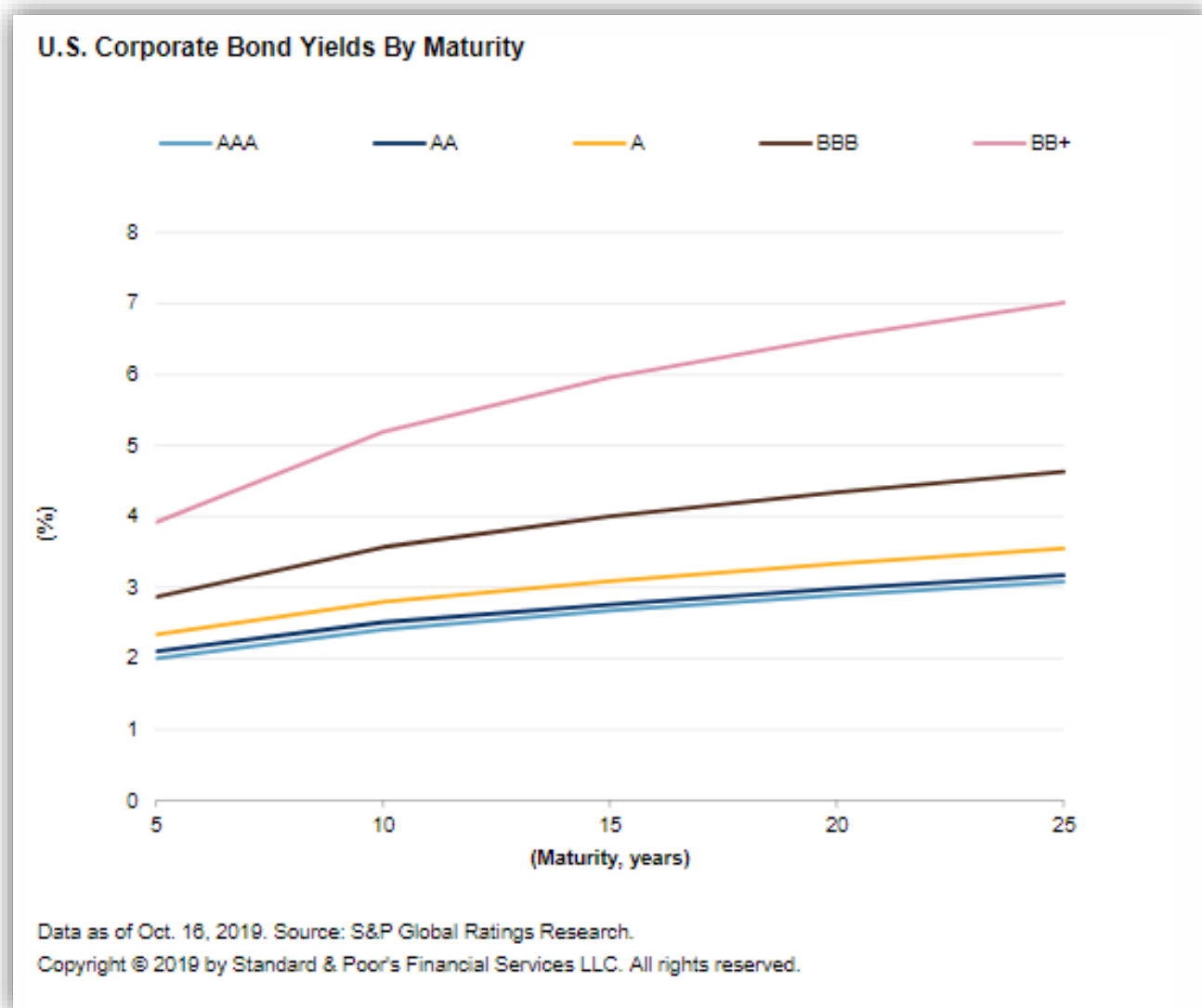
Reuters Corporate Spreads for Industrials*



Rating	1 yr	2 yr	3 yr	5 yr	7 yr	10 yr	30 yr
Aaa/AAA	13	17	20	37	59	77	93
Aa1/AA+	35	36	39	57	77	90	108
Aa2/AA	37	39	41	64	80	93	116
Aa3/AA-	39	45	47	74	86	96	118
A1/A+	47	74	77	90	96	116	134
A2/A	62	79	81	91	98	118	135
A3/A-	67	81	85	96	106	125	140
Baa1/BBB+	82	100	101	117	134	155	176
Baa2/BBB	87	104	109	129	142	165	181
Baa3/BBB-	92	105	110	137	156	180	192
Ba1/BB+	155	175	185	215	235	255	305
Ba2/BB	165	185	195	225	245	265	315
Ba3/BB-	175	195	205	235	255	275	325
B1/B+	270	290	300	325	360	385	435
B2/B	280	300	310	335	370	395	445
B3/B-	290	310	320	355	380	405	455
Caa/CCC	345	355	365	430	480	535	575

Source: *BondsOnline.com*

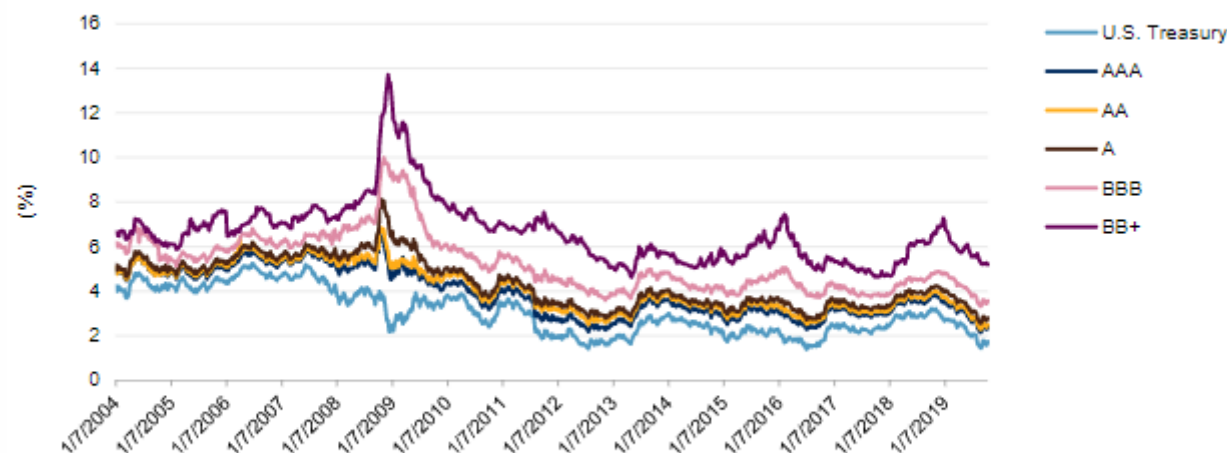
U.S. Corporate Bond Yields by Maturity (October 2019)



Source: Credit Trends: U.S. Corporate Bond Yields as of Oct 16. 2019

Comparison of yields by ratings at different maturities:

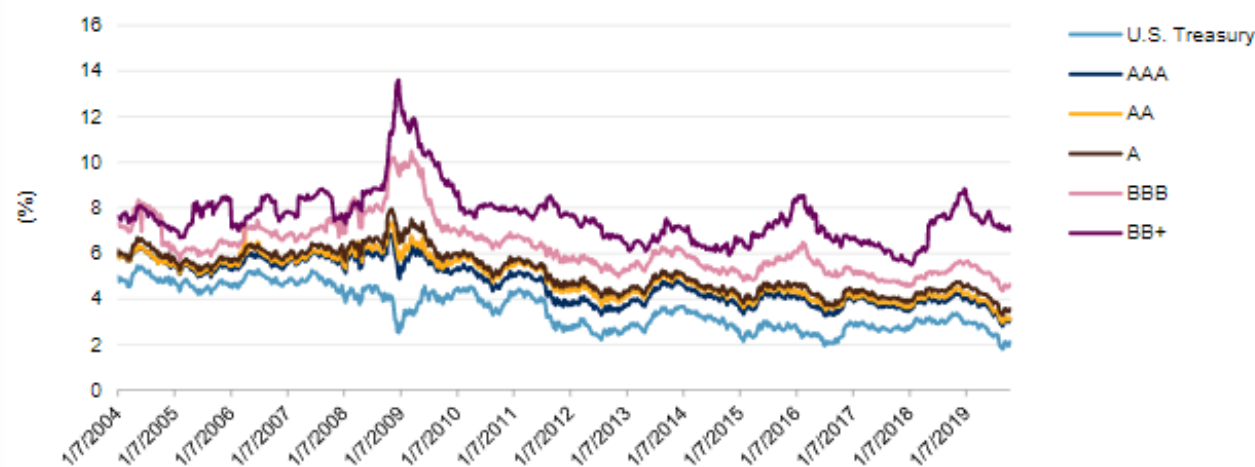
Historical Corporate Bond Yields--10-Year Maturity



Data as of Oct. 16, 2019. Source: S&P Global Ratings Research.

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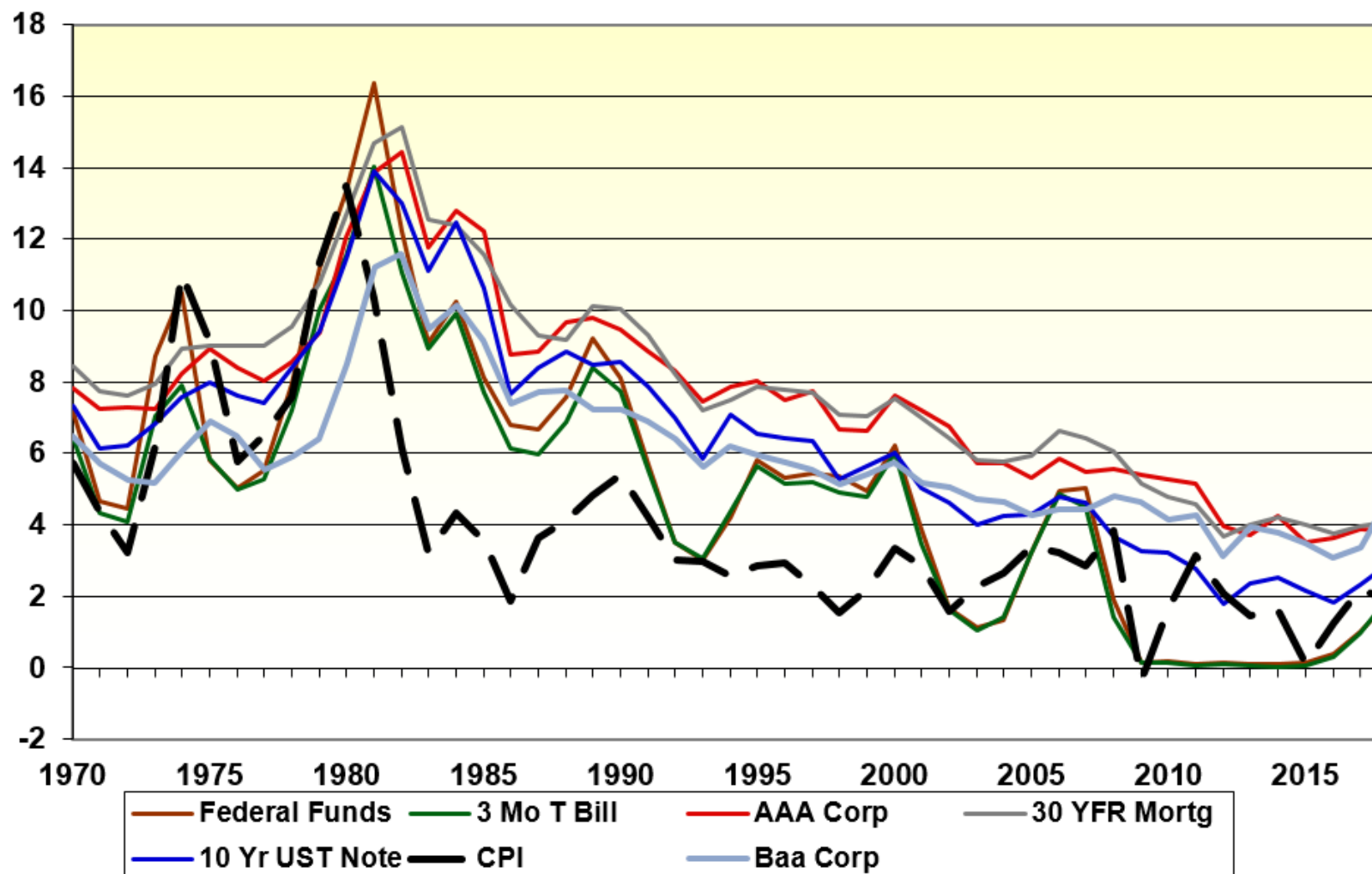
Historical Corporate Bond Yields--25-Year Maturity



Data as of Oct. 16, 2019. Source: S&P Global Ratings Research.

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Select Interest Rates and the Consumer Price Index (1970-2018)



Important topical: Current yields do not reflect true risk

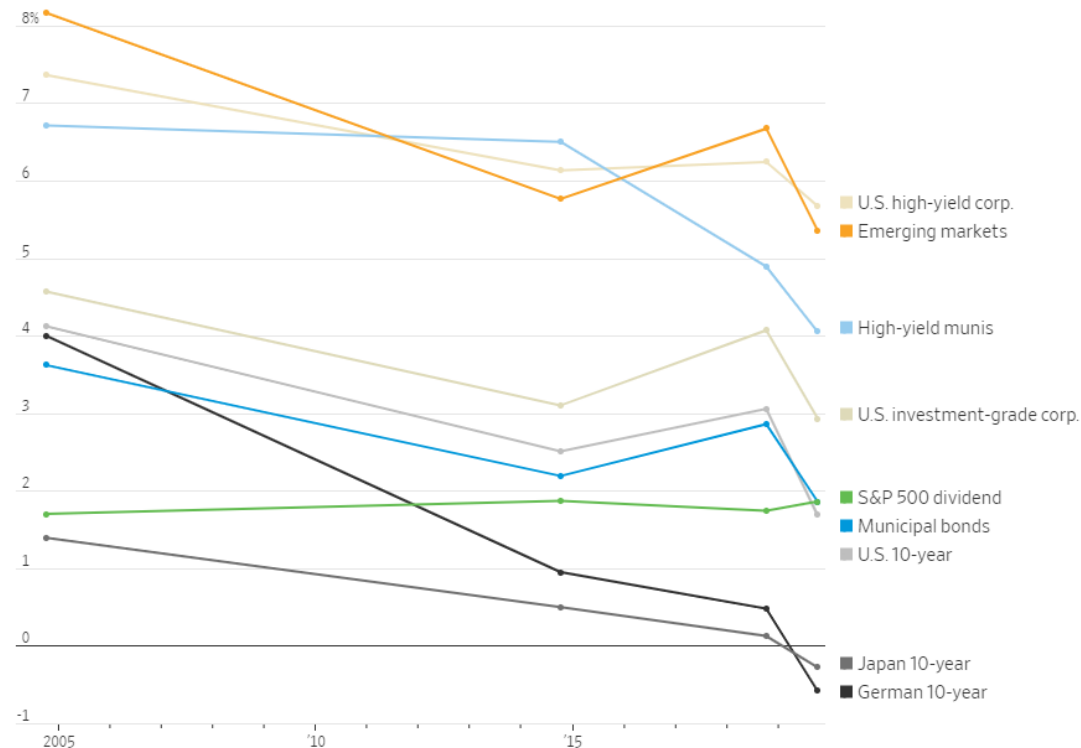
THE WALL STREET JOURNAL.

MARKETS

Investors Scramble for Yield as Growth Outlook Darkens

Some need to take more risk or lower longer-term expectations

Bond and dividend yields



Note: Chart includes data for JPMorgan Emerging Market Bond Index and Bloomberg Barclays Indexes.

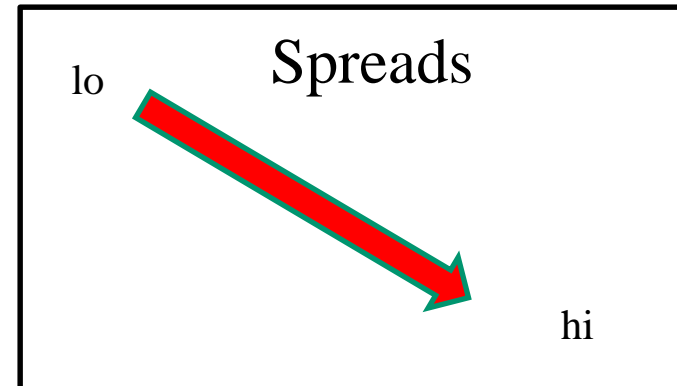
Sources: Ryan ALM (U.S.); Federal Reserve Bank of St. Louis (Japan); CQG (Germany); FactSet (Bloomberg Barclays); J.P. Morgan (EMBI)

Wall Street Journal

9/30/19

Summary of points made ...

1. Bond rating services rate corporate bonds based upon their projected default rates.
2. Bonds with higher default probabilities will have higher yields.
3. Bonds with longer maturities also have higher yields.
4. Interest rates for all YBFA rise and fall together, but conditions 1 through 3 above will always hold.
5. Any table that shows bonds spreads (compared to Treasuries) with ratings on the vertical axis, high to low, and maturities on the horizontal axis, will show spreads rising from left to right and top to bottom:
6. Therefore, **higher yields** implies **higher risk**!



Don't forget agency debt ...

DWBH!

For exam purposes, just know what this is ...

Figure 9 Federal Agency Debt, Long and Short Term (as of 2017 Q2)			
Agency	Nickname	Primary Function	Bills *
			Bonds
Federal National Mortgage Association	Fannie Mae	Secondary market for residential mortgages (GSE).	30,527
			273,535
Federal Home Loan Mortgage Corporation	Freddie Mac	Secondary marekt for residential mortgages (GSE).	67,742
			272,259
Federal Farm Credit Bank	[none]	Sells bonds and notes to fund the Farm Credit System (GSE).	25,672
			232,898
Federal Home Loan Bank	FHLB	Sells bonds and notes to make loans to financial institutions so they can fund mortgages (GSE).	429,248
			581,938
Federal Agricultural Mortgage Corporation	Farmer Mac	Sells bonds and notes to fund farm mortgages and other agricultural loans (GSE).	7,282
			7,859
Tennessee Valley Authority	TVA	Regional U.S. government agency covering portions of seven states that provides utilities, recreational facilities and mutiple other services.	1,005
			24,174
		Total:	561,476
			1,392,663
		Total all debt:	1,954,139

*Securities with maturities of less than one year at time of issue. Bonds have maturities of more than one year.

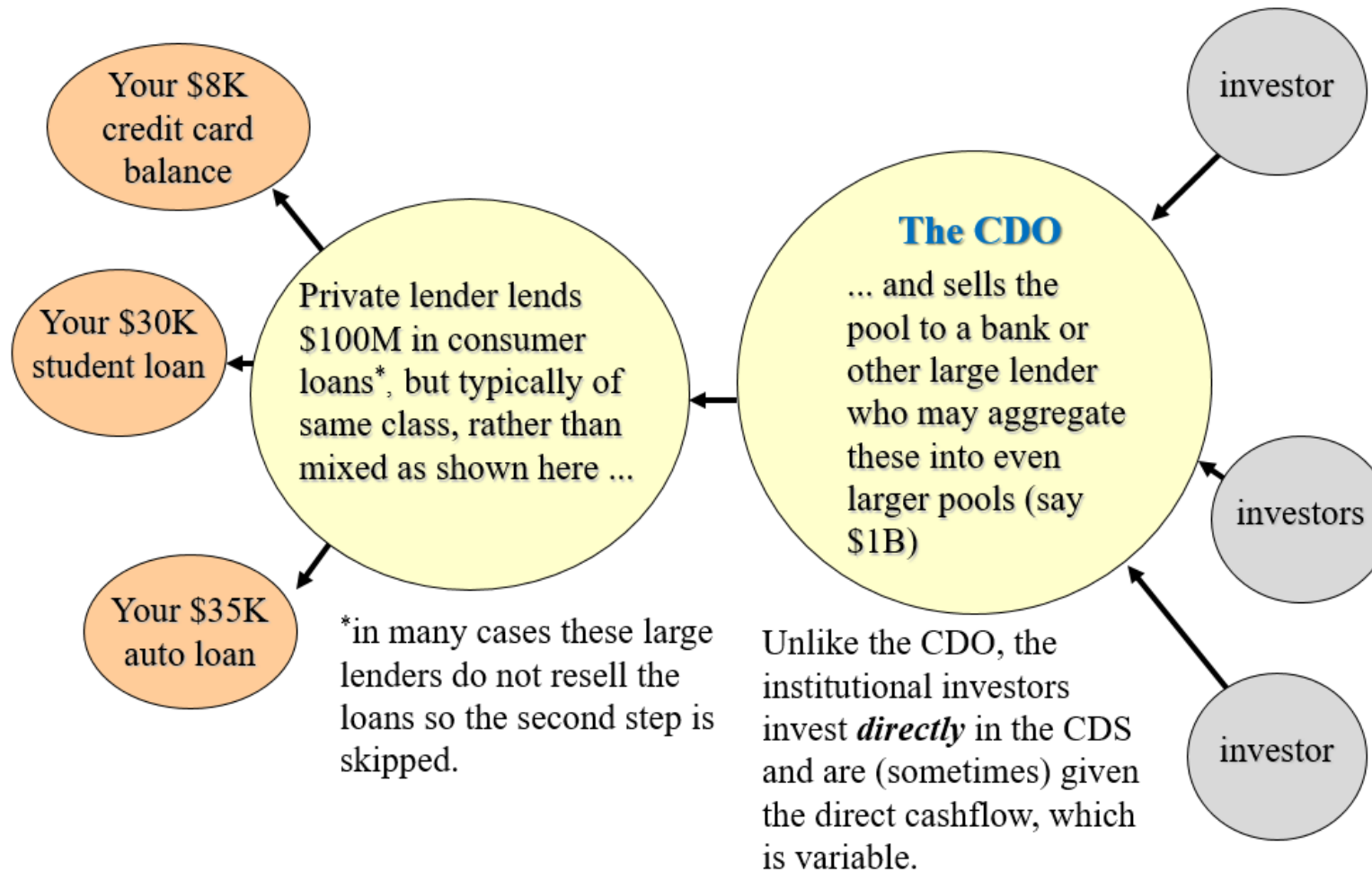
Source: **sifma** U.S. Agency Debt Outstanding, 8/9/2017.

Municipal Bonds

- Issued by state and local governments, or agencies of these.
- Two types
 - General obligation (State of California)
 - Agency (School district_
 - Revenue bonds (secured by revenues or taxes)
- Tax free (many restrictions)
 - Tax free federal always
 - Tax free state if resident of state issuing bonds
- Have lower yields reflecting tax free status.

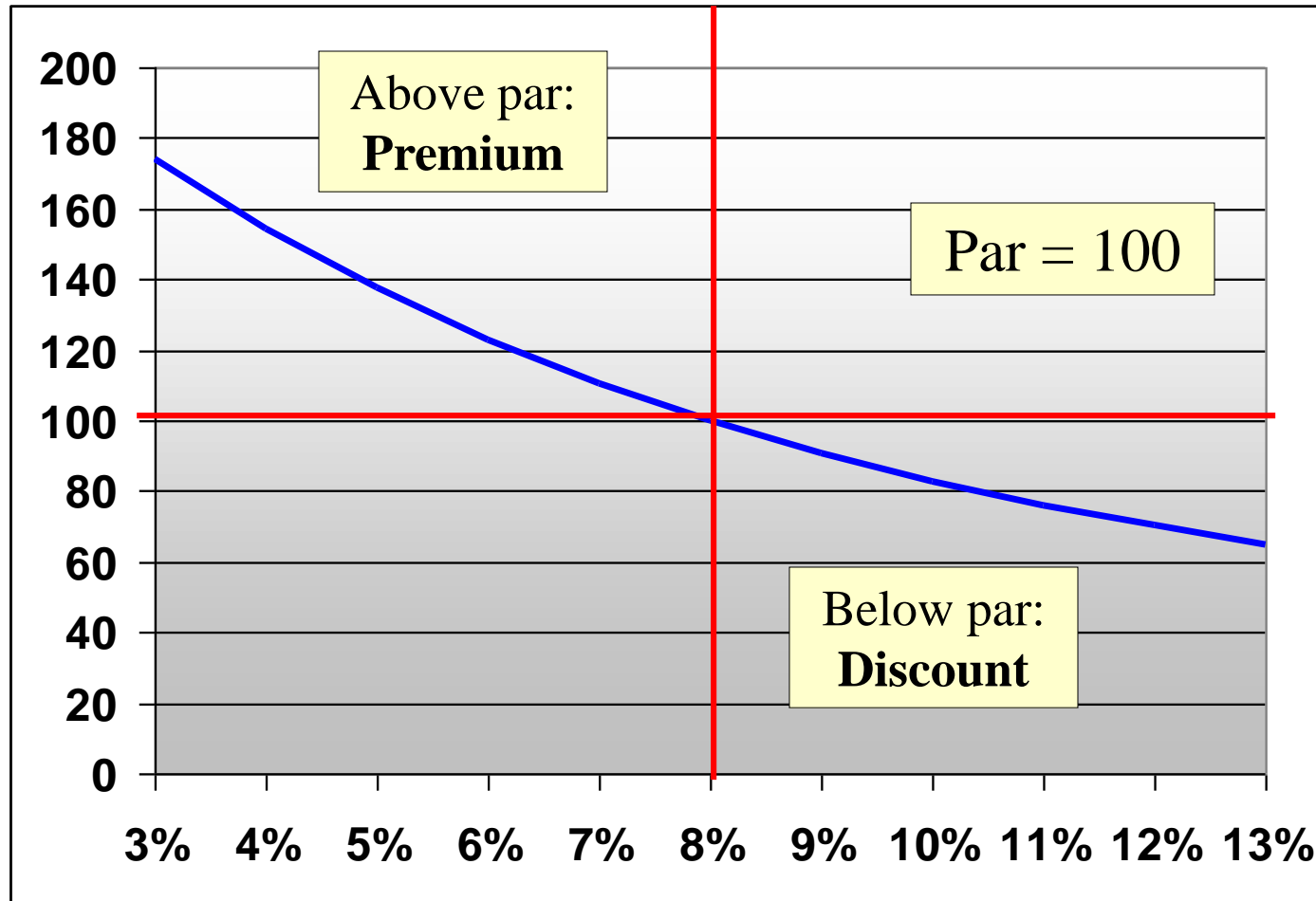


Collateralized Debt Obligations (CDOs), also called Asset Backed Securities (ABS) : pass-thru assets where the buyers get the cashflow



Next important thing to know: Bond market values and market interest rates move inversely. When interest rates rise, bond and note rates fall. Capital losses are possible in a rising-rate environment.

Possible future value of a 30-year bond 10 years after issue given a range of possible interest rates ... where we are going in Chapter 8.



This relationship is approached mathematically in chapter 8, so we leave it here for now.

This shows the full range of ask-yields (ytm) possible for an original 30-year bond with 8% coupon 10 years later when compared to a 20-year bond with possible yields shown on the bottom axis.

Figure 18 - Select bond ETFs

Select Bond ETFs

Bond/Note/Bill category	Symbol	Assets	Volume
U.S. Treasury		(\$ billions)	(\$ thous)
iShares 1-3 Year UST	SHY	\$17.63	2,210
iShares 3-7 Year UST	IEI	\$9.30	1,017
iShares 7-10 Year UST	IEF	\$18.60	1,735
iShares 20+ UST	TLT	\$18.50	12,831
Corporate			
iShares iBoxx Investment Grade Corporate	LQD	\$35.22	10,435
SPDR Barclays Capital High Yield	JNK	\$10.45	6,769
Vanguard Short-term Corporate	VCSH	\$25.18	1,315
Vanguard Intermediate-term Corporate	VCIT	\$25.61	1,966
Vanguard Long-term Corporate	VCLT	\$3.97	474
Other			
Total Bond Market	BND	\$45.95	3,062
iShares JP Morgan Emerging Markets	EMB	\$14.01	4,225
Total International Bond	BNDX	\$23.07	2,018
iShares National Muni	MUB	\$14.30	815

Figure 6
Select U.S. Treasury ETFs

Family	Fund	Symbol
iShares	Treasury Bill	SHV
iShares	1-3 Year Treasury Note	SHY
iShares	3-7 Year Treasury Note	IEI
iShares	7-10 Year Treasury Note	IEF
iShares	10-20 Year Treasury Bond	TLH
iShares	20+ Year Treasury Bond	TLT
iShares	TIPS Bond	TIP
SPDR	1-3 Month Treasury Bill	BIL
SPDR	Intermediate Term Treasury	ITE
SPDR	Long Term Treasury	TLO
SPDR	TIPS	IPB
Vanguard	Short Term Government	VGSH
Vanguard	Intermediate Term Government	VGIT
Vanguard	Long Term Government	VGLT

Source: ETFdb.com, October 21, 2019

Assets are in billions of dollars. Volume is 3-mo average trading volume in thousands (of shares of the ETF).

Values as of October 21, 2019.

Some of the fund names are abbreviations of the formal names assigned to the funds.

Source: *SeekingAlpha*

Fixed Income ETFs (ex 1):

Oct 27, 2019
Past 2 years.

Most fixed-income ETFs distribute “dividends” that reflect interest earned, so their NAV reflects market value discount or premium from par.

PIMCO Investment Grade Corporate Bond Index - CORP

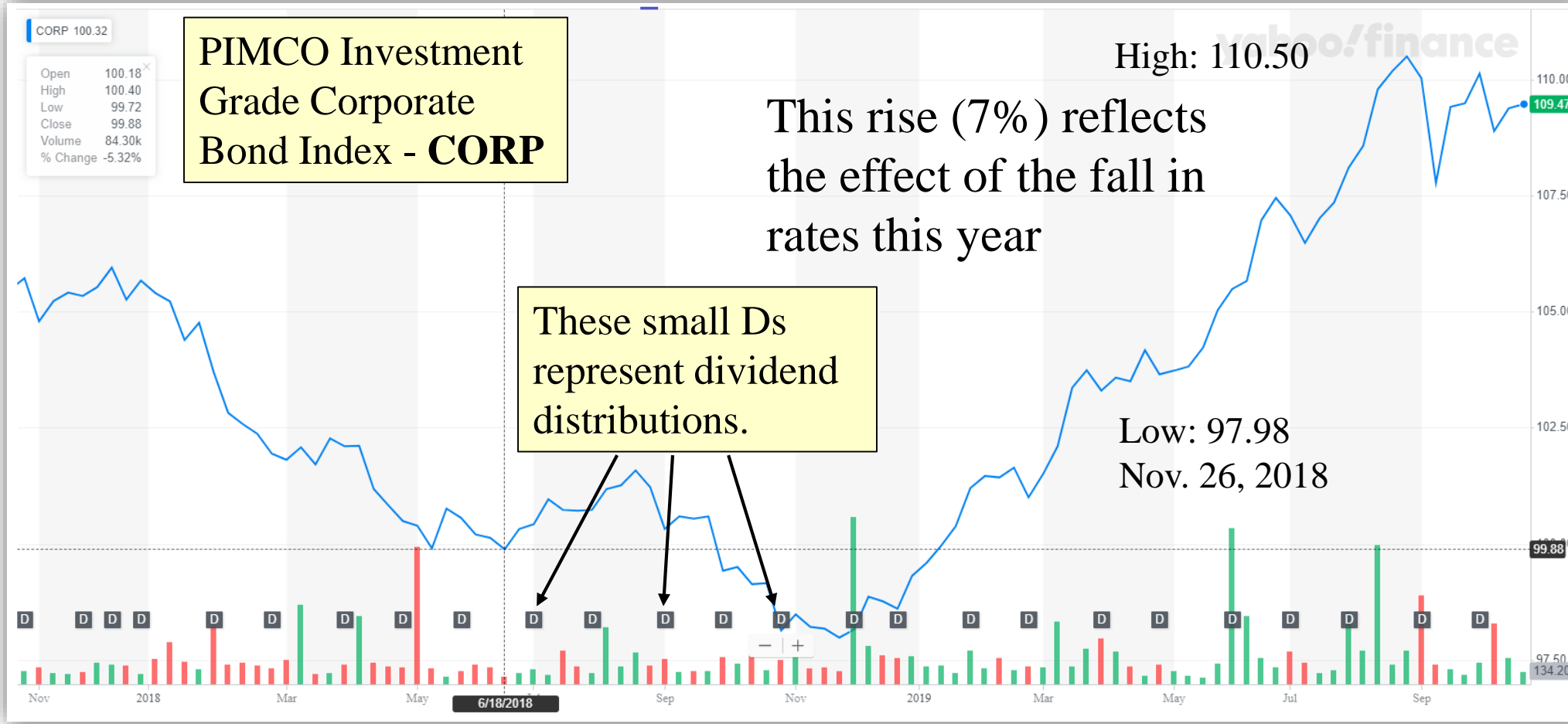
CORP 100.32
Open 100.18
High 100.40
Low 99.72
Close 99.88
Volume 84.30k
% Change -5.32%

High: 110.50

This rise (7%) reflects
the effect of the fall in
rates this year

These small Ds
represent dividend
distributions.

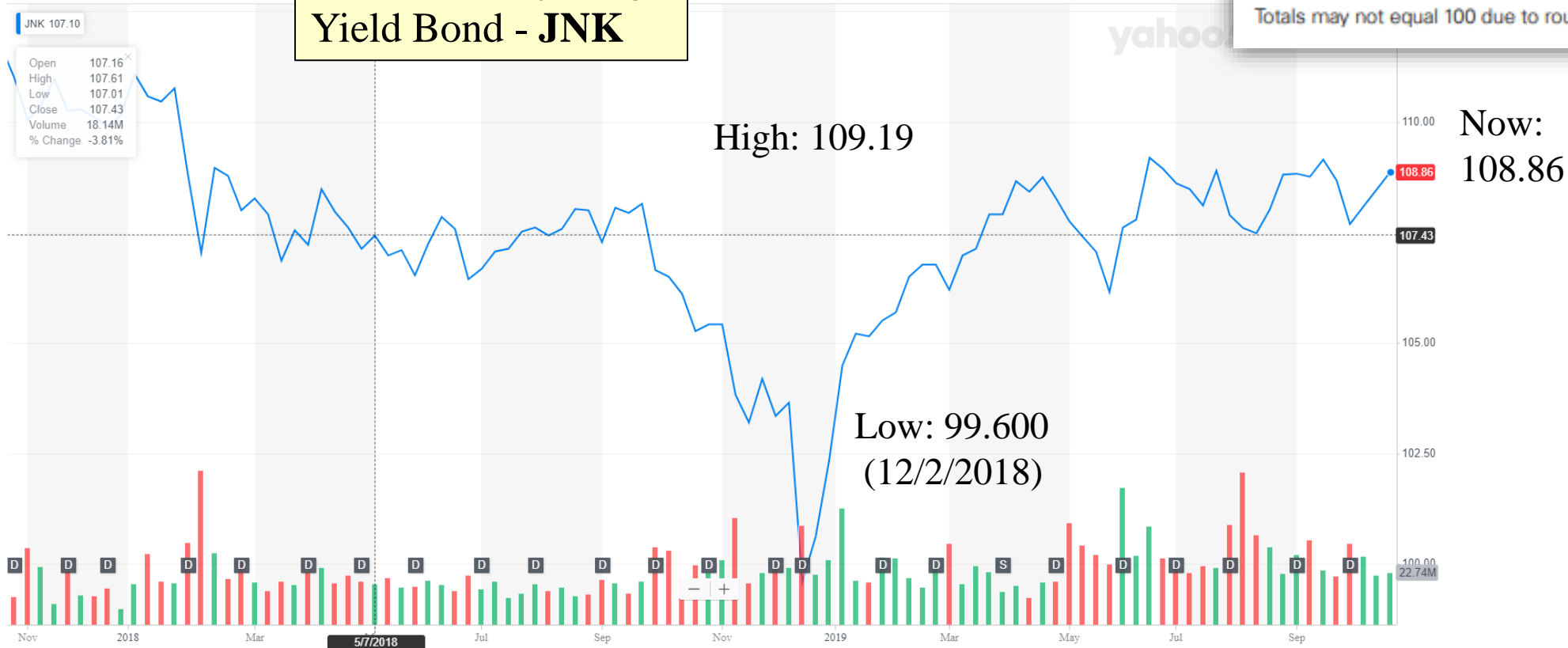
Low: 97.98
Nov. 26, 2018



Fixed Income ETFs (ex2):

This popular ETF represents junk bonds ... bonds with mostly B and BB ratings. Your teacher regards the price appreciation of these, which implies plunging yields, to be absolutely insane.

SPDR Barclays High Yield Bond - JNK



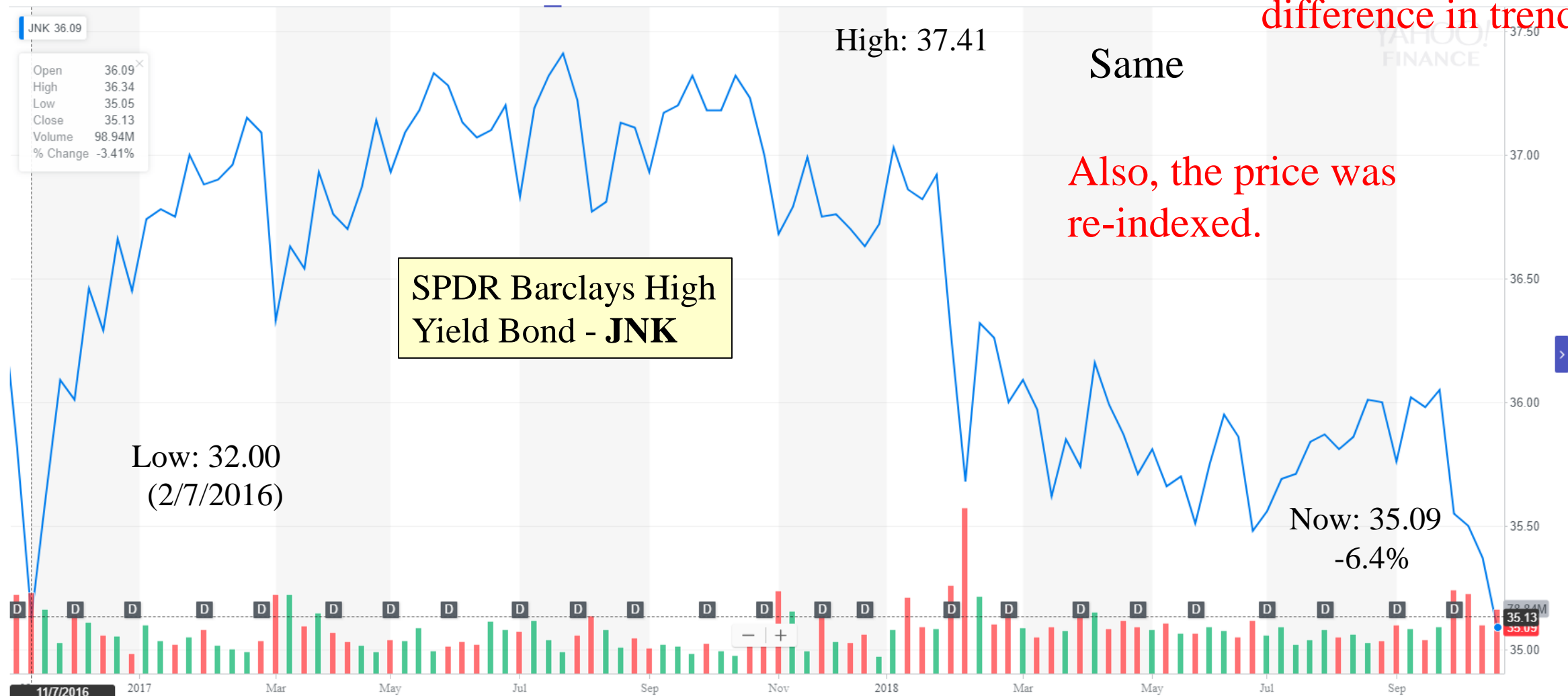
Quality Breakdown	Weight (%)
BBB or Higher	-0.33
BB	42.87
B	42.41
CCC or Lower	14.97
Not Rated	0.08

Totals may not equal 100 due to rounding.

Fixed Income ETFs (ex2):

This popular ETF represents junk bonds ... bonds with mostly B and BB ratings. Your teacher regards the price appreciation of these, which implies plunging yields, to be absolutely insane.

This is the same
slide from last year
.. look at the
difference in trend!



Interest distributions ...

... which makes these very different from equity and commodity ETFs. The NAV only shows the premium and discount to fluctuating bond prices. In addition to that you get a monthly (typically) distribution based upon interest coupon payments. Show below is the recent distribution schedule of the popular **ishares iBoxx \$ Investment Grade Corporate Bond ETF LQD** (NAV at 127.29 on October 1, 2019).

Ex-Date ▼	Total Distribution ⓘ▶
Oct 01, 2019	\$0.335557
Sep 03, 2019	\$0.349172
Aug 01, 2019	\$0.347757
Jul 01, 2019	\$0.354506
Jun 03, 2019	\$0.370779
May 01, 2019	\$0.351627
Apr 01, 2019	\$0.357954
Mar 01, 2019	\$0.358431

So in recent months this has equalled about 35 cents per month per share (per \$100 par).

This is the primary attraction of bond investments and etfs ... their coupons.

Three of the big bond etfs that your prof monitors ...





Warning!!

These bonds and the ETFs that hold them may prove illiquid in a crisis!

From the iShares iBoxx High-Yield Corporate Bond (HYG) Prospectus, page S3, July 1, 2016.



?

Authorized Participant Concentration Risk. Only an Authorized Participant (as defined in the *Creations and Redemptions* section of the Fund's prospectus (the "Prospectus")) may engage in creation or redemption transactions directly with the Fund. The Fund has a limited number of institutions that may act as Authorized Participants on an agency basis (*i.e.*, on behalf of other market participants). To the extent that those Authorized Participants exit the business or are unable to proceed with creation and/or redemption orders with respect to the Fund and no other Authorized Participant is able to step forward to create or redeem Creation Units (as defined in the *Purchase and Sale of Fund Shares* section of the Prospectus), Fund shares may be more likely to trade at a premium or discount to NAV and possibly face trading halts and/or delisting.

Concerns:

This flood of liquidity justified by recovery from the last deep recession has made it very easy to fund business expansion and international projects with junk bonds .. meaning bonds rated BB or below. Companies like Frontier Communications and projects like shale-oil drilling were funded with these bonds.

Because of the explosive rallies in nearly all markets in 2017, the effective market yields of these bonds, and the ETFs made up of these bonds, dipped far below any reasonable threshold defined by the risk ratings described in this lecture, despite the fact that default rates were clearly rising. In 2018, rates are higher but still not very high by historical standards.

There will be a day of reckoning. I also said this last year and nothing has happened.

But I also said that no-one is very good at predicting turning points, including me.

Tax features of bonds and notes

- Generally
 - Cap gain from trading taxed in year of sale
 - Principal redemption at maturity not taxed
- Treasuries
 - Coupon interest is taxed
 - but tax-free at state and local level
 - interest earned on TIPS is not taxed at the state and local level. *However*, capital appreciation to the inflation adjustment is taxed each year as normal income. This, in fact, is reported by the Treasury to the IRS on a 1090-OID.
- Munis
 - capital gains always taxed
 - interest income not taxed at federal level
 - .. nor state level if issued in state of residence
- Corporate
 - all interest and cap gains taxable