

FIXED INCOME MARKETS THEN AND NOW

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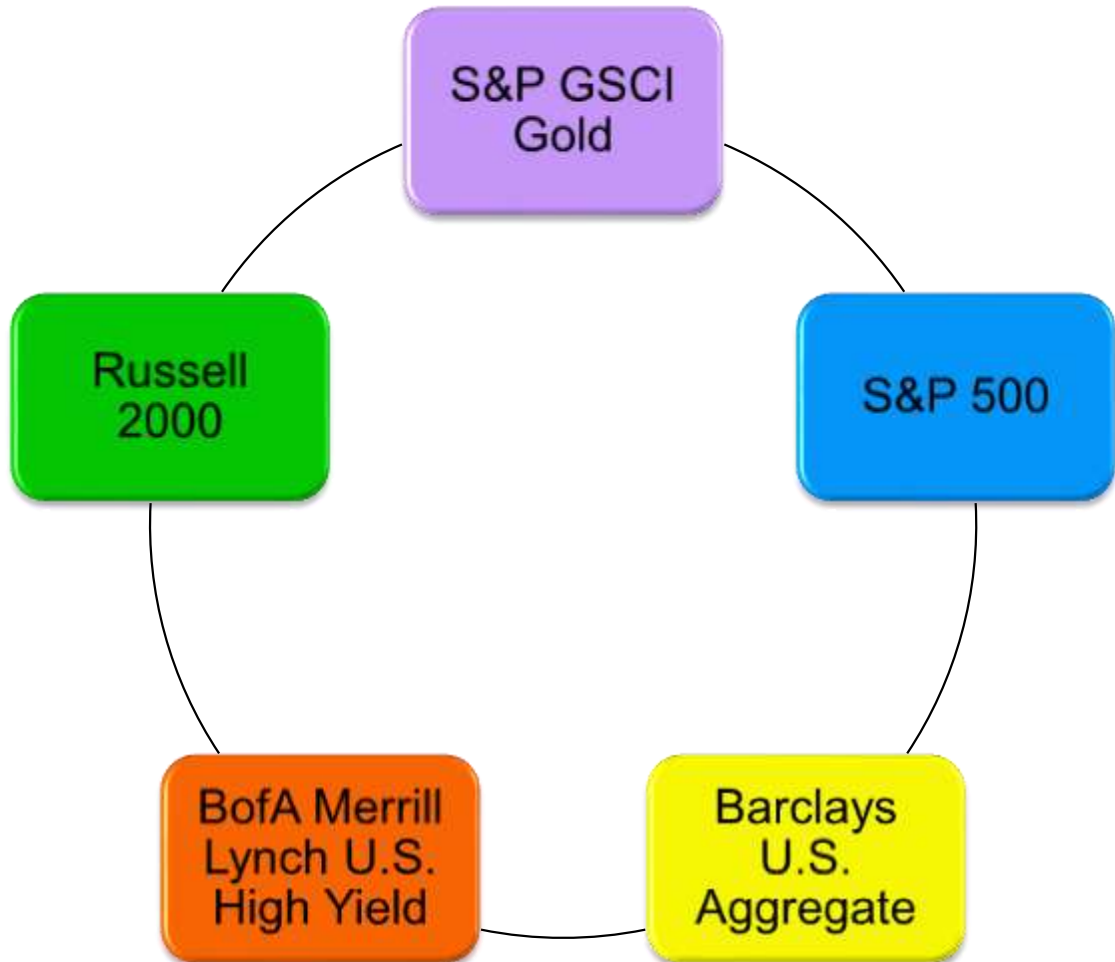
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- III. Evolution of the Fixed Income Market**
- IV. Valuation**
- V. Market Developments**

Question: 2015

2



10 -Year Annualized Returns Ending 9-30-15

8.13%

7.11%

6.80%

6.55%

4.64%

Answer: 2015

3

Asset Class

S&P GSCI Gold

BofA Merrill Lynch U.S. High Yield

S&P 500

Russell 2000

Barclays U.S. Aggregate

10 -Year Annualized Returns Ending 9-30-15

8.13%

7.11%

6.80%

6.55%

4.64%

Why is Return not enough?

4

- Return alone doesn't account for the risk required to achieve that return
- Investors must be compensated for risk
- Therefore, we should measure returns on a risk adjusted basis

Sharpe Ratio

5

- Developed by Nobel laureate William F. Sharpe
- The return earned in excess of the risk-free rate per unit of total risk

$$\text{Sharpe Ratio} = \frac{\mathbf{R} - \mathbf{R}_f}{\sigma}$$

- A higher Sharpe ratio equates to better risk-adjusted performance

Reality: 2015

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Asset Class	10 -Year Sharpe Ratio Ending 9-30-15	10 -Year Annualized Returns Ending 9-30-15
Barclays U.S. Aggregate	1.05	4.64%
BofA Merrill Lynch U.S. High Yield	0.56	7.11%
S&P 500	0.37	6.80%
S&P GSCI Gold	0.35	8.13%
Russell 2000	0.27	6.55%

Source: Zephyr
Last Update: 9/30/2015

What are Bonds?

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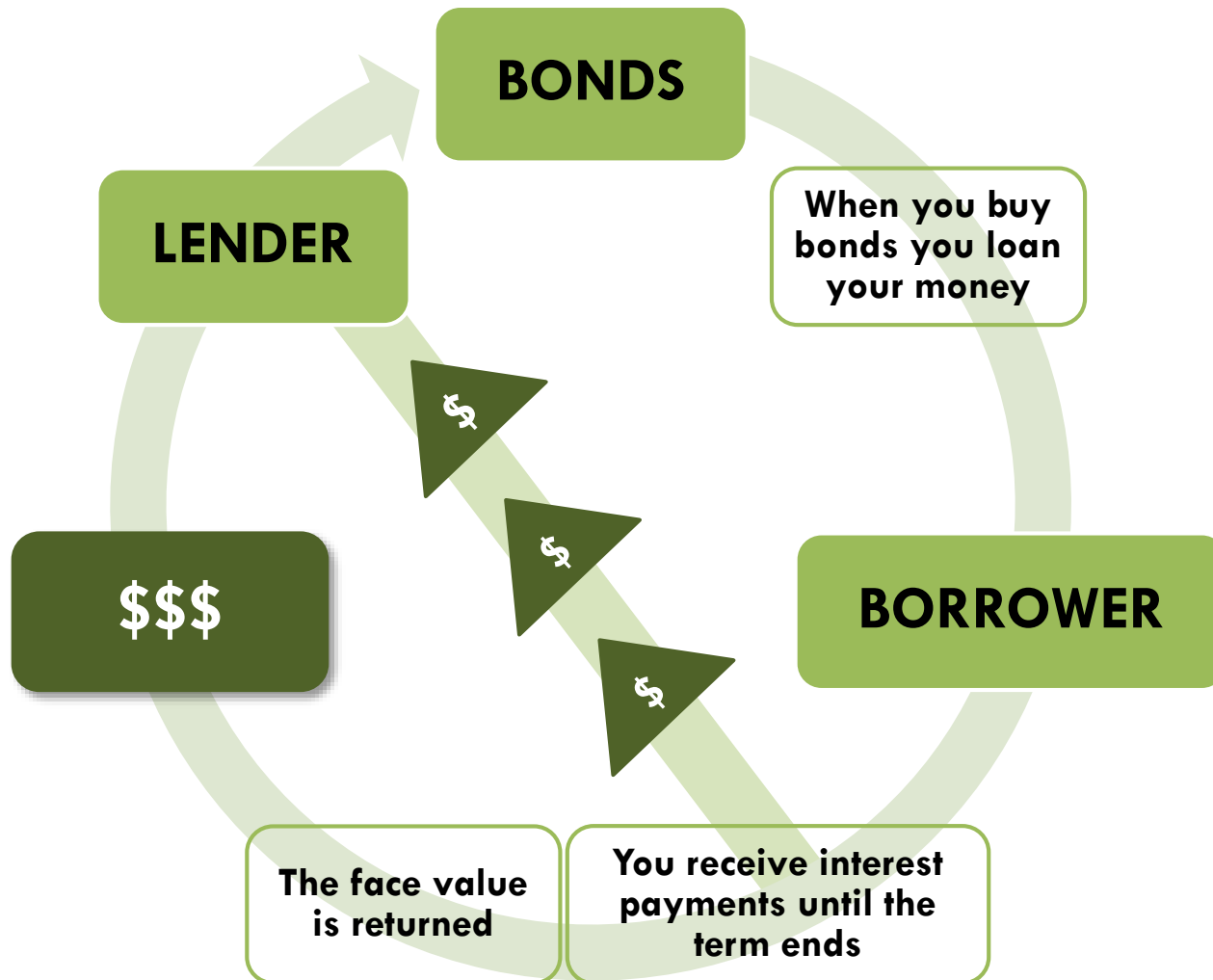


Bonds 101: What are bonds and why do they exist?

- A bond is a debt security, similar to an **I.O.U.**
- When you purchase a bond, you are lending money to a an *issuer*.
- In return for that money, the issuer provides you with a promise to pay a specified rate of *interest* during the life of the bond and to repay the *principal* when it comes due.

Life of a Bond

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Types of Bonds

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Corporate



Securitized



Treasury



Agency



Features: Coupon

10

Coupon:

A feature of a bond that denotes the amount of interest due, and the date payment will be made.

- A bond is normally an interest-only loan, meaning the borrower pays the interest every period, but none of the principal is repaid until the end of the loan.

Features: Maturity

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Maturity:

The date when the principal amount of a security is due to be repaid.

- Generally, bond terms range from one year to 30 years
- **Short-term bonds** generally **offer lower yields**
- **Long-term bonds** generally **offer higher yields**

Features: Rating

12

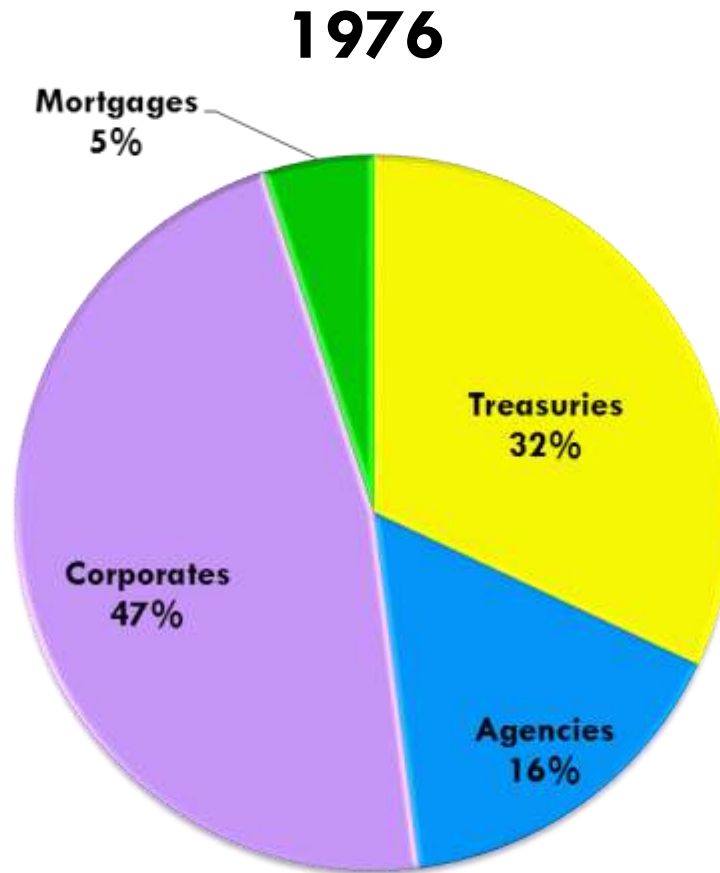
Rating:

Designations used by credit rating agencies to give relative indications as to opinions of credit quality.

- Generally speaking, a **higher rating** means **less risk** but a **lower potential return** and vice-versa.

Barclays Capital U.S. Aggregate Index

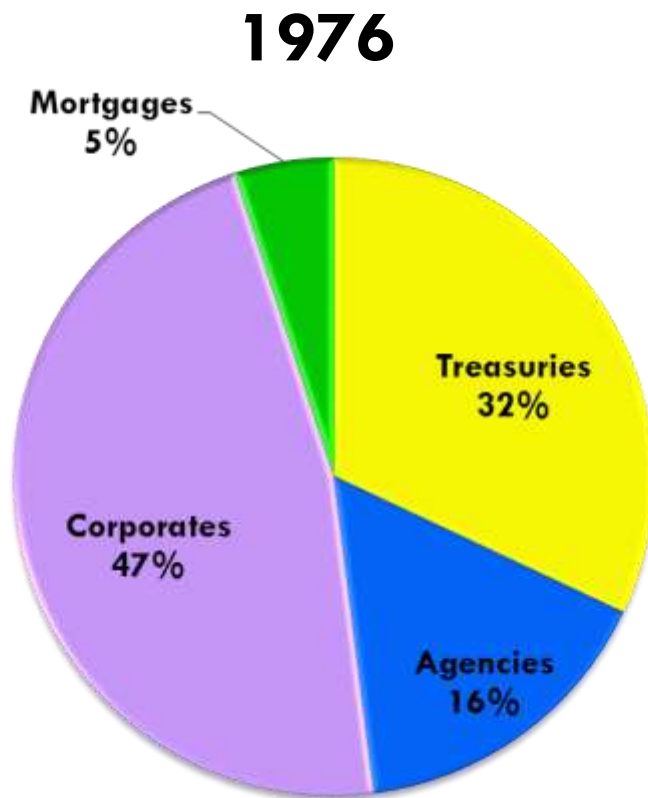
13



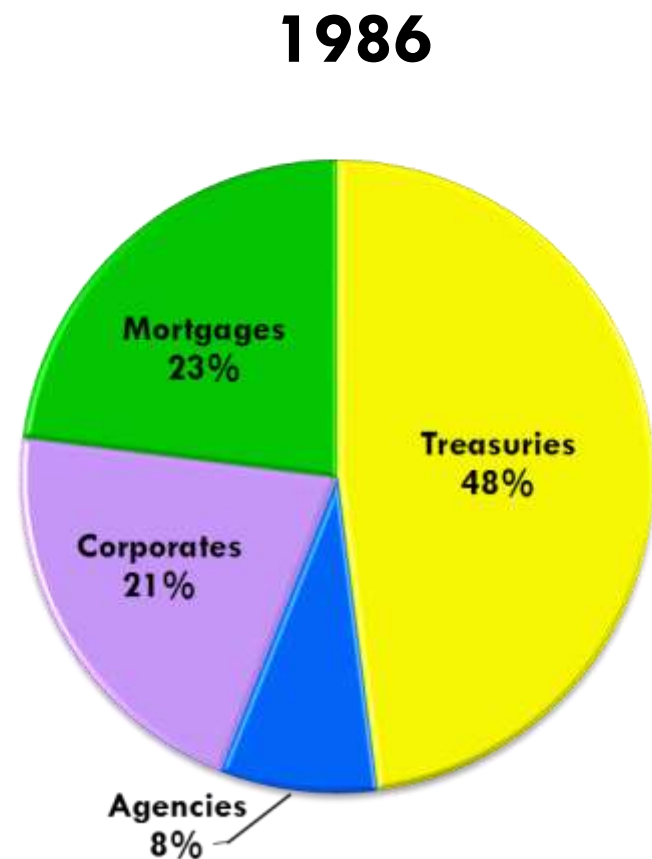
\$456 Billion

Barclays Capital U.S. Aggregate Index

14



\$456 Billion

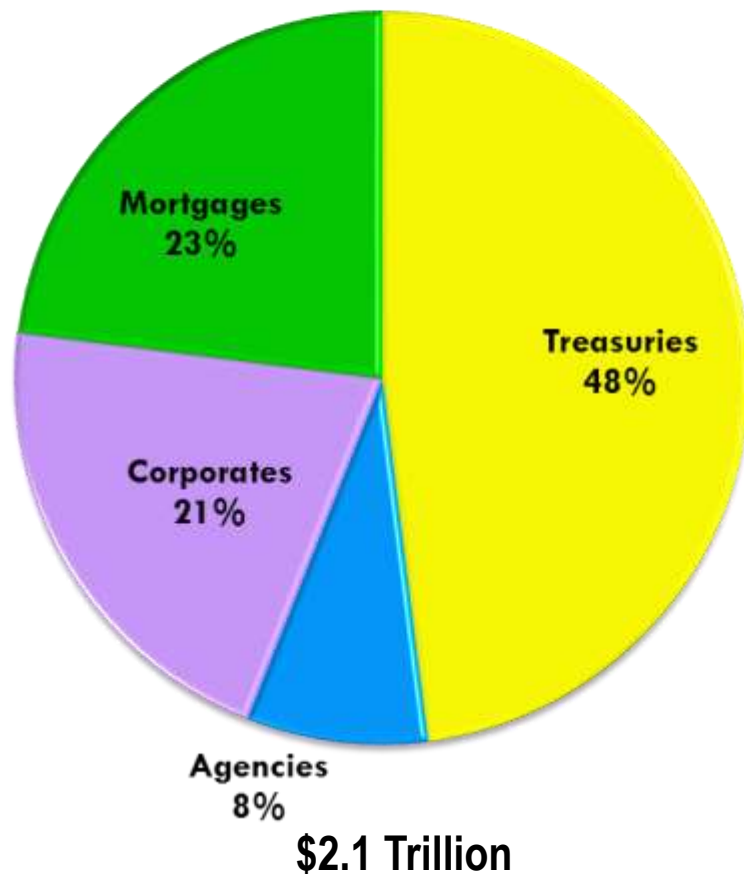


\$2.1 Trillion

Barclays Capital U.S. Aggregate Index

15

1986

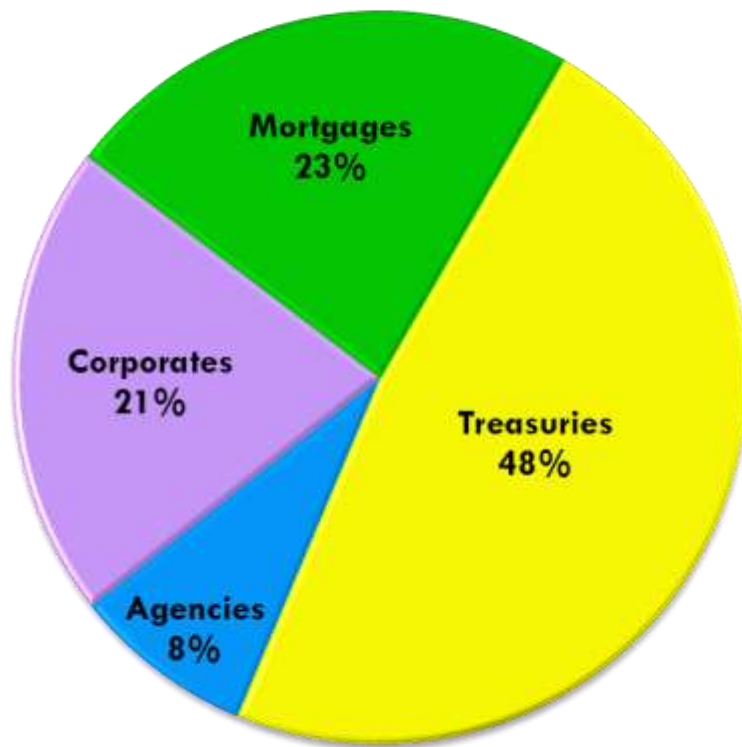


- CMO's invented in 1983
- 15-year MBS added to the index in 1985

Barclays Capital U.S. Aggregate Index

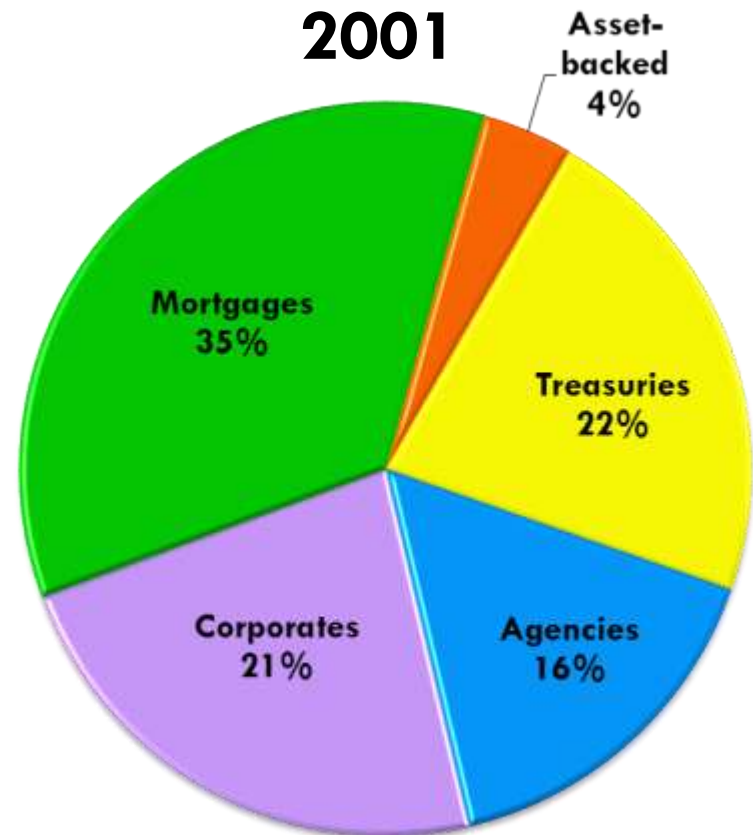
17

1986



\$2.1 Trillion

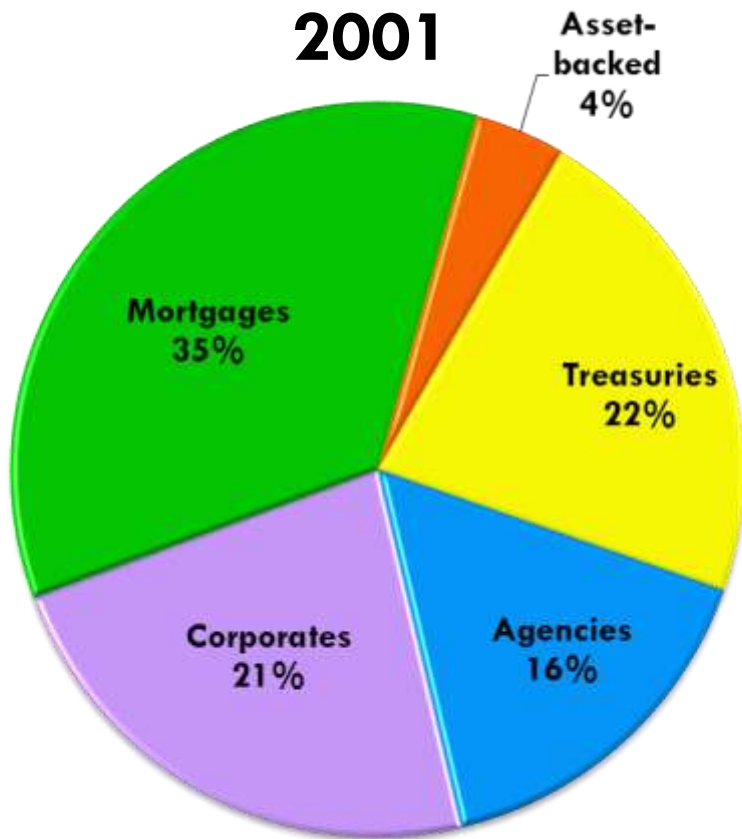
2001



\$6.9 Trillion

Barclays Capital U.S. Aggregate Index

17



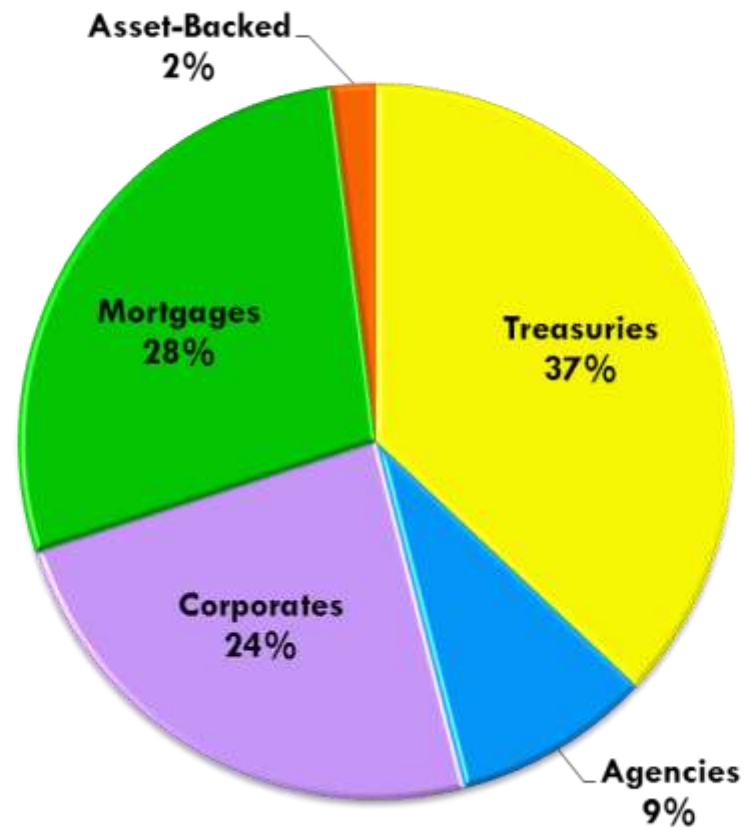
\$6.9 Trillion

- Asset-Backed Securities (ABS) added in 1991
- Mortgage Balloons added in 1992
- 20-year MBS added in 2000

Barclays Capital U.S. Aggregate Index

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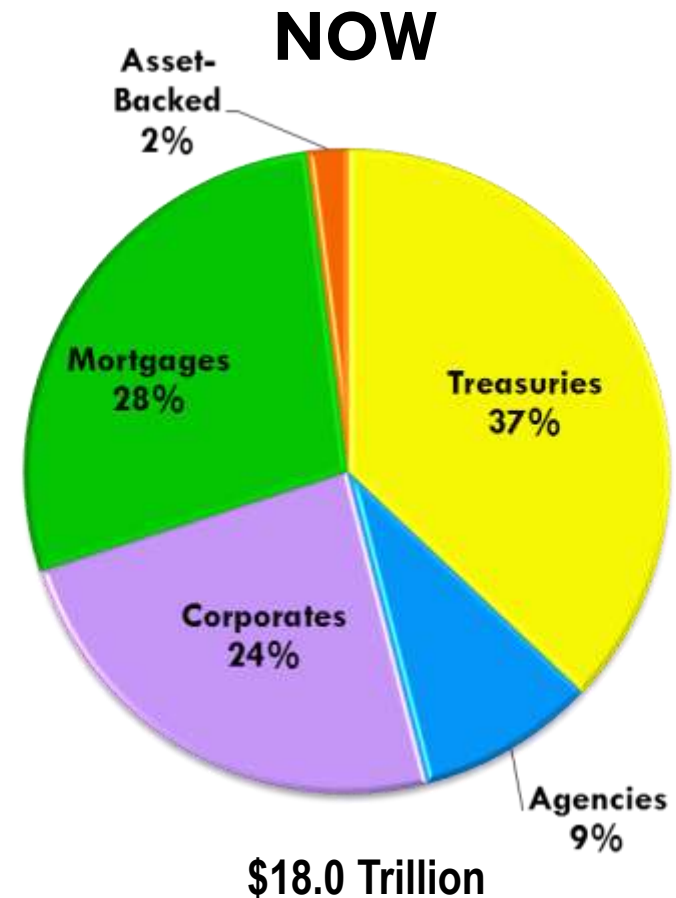
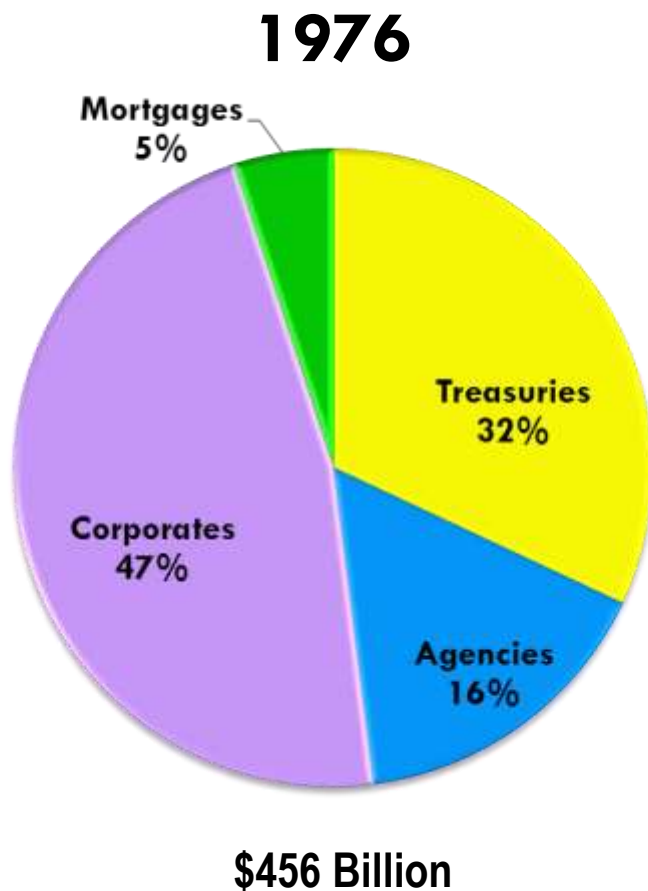
NOW



\$18.0 Trillion

Barclays Capital U.S. Aggregate Index

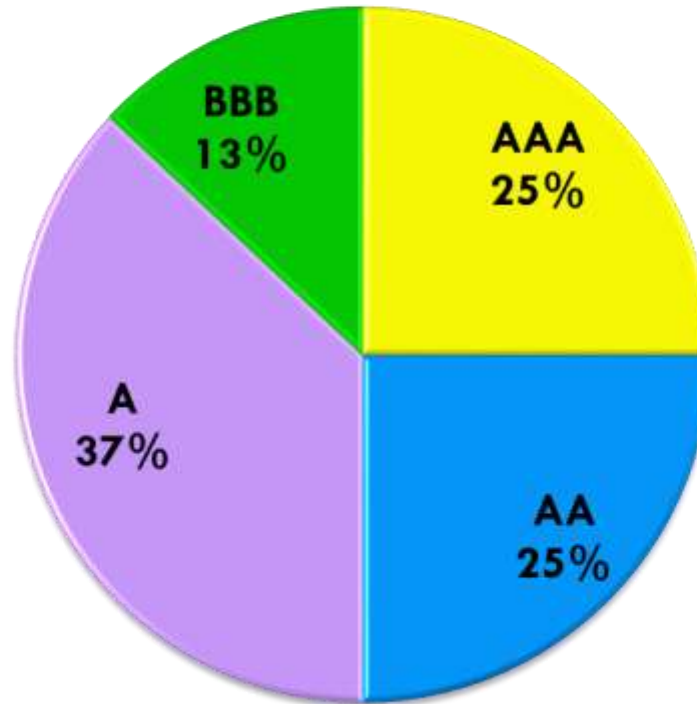
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Corporate Credit Quality Distribution

20

1980

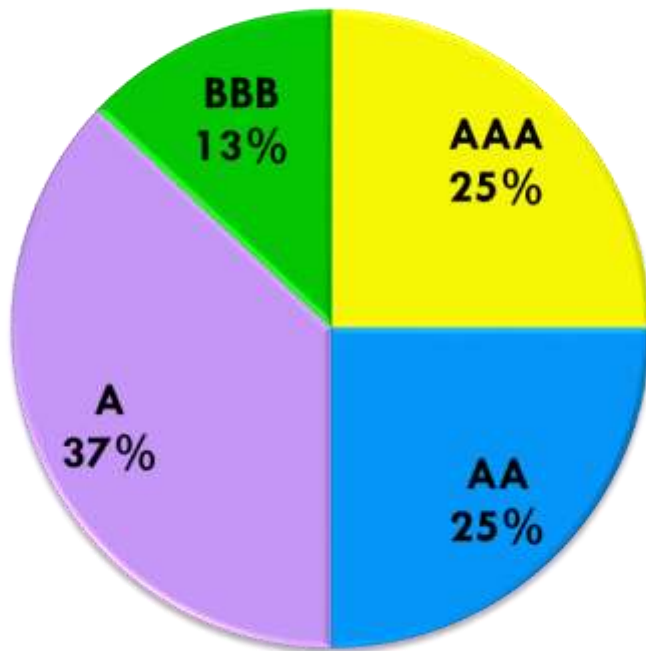


\$178 Billion

Corporate Credit Quality Distribution

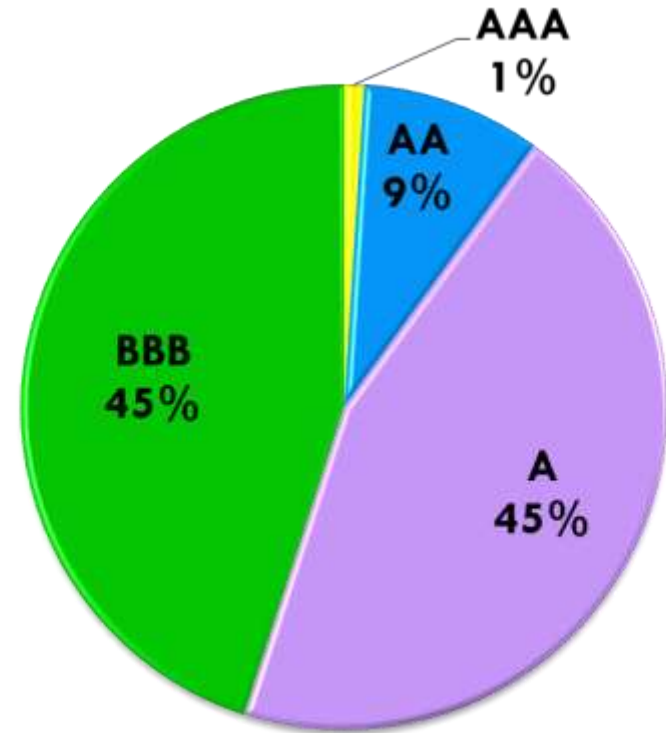
21

1980



\$178 Billion

NOW

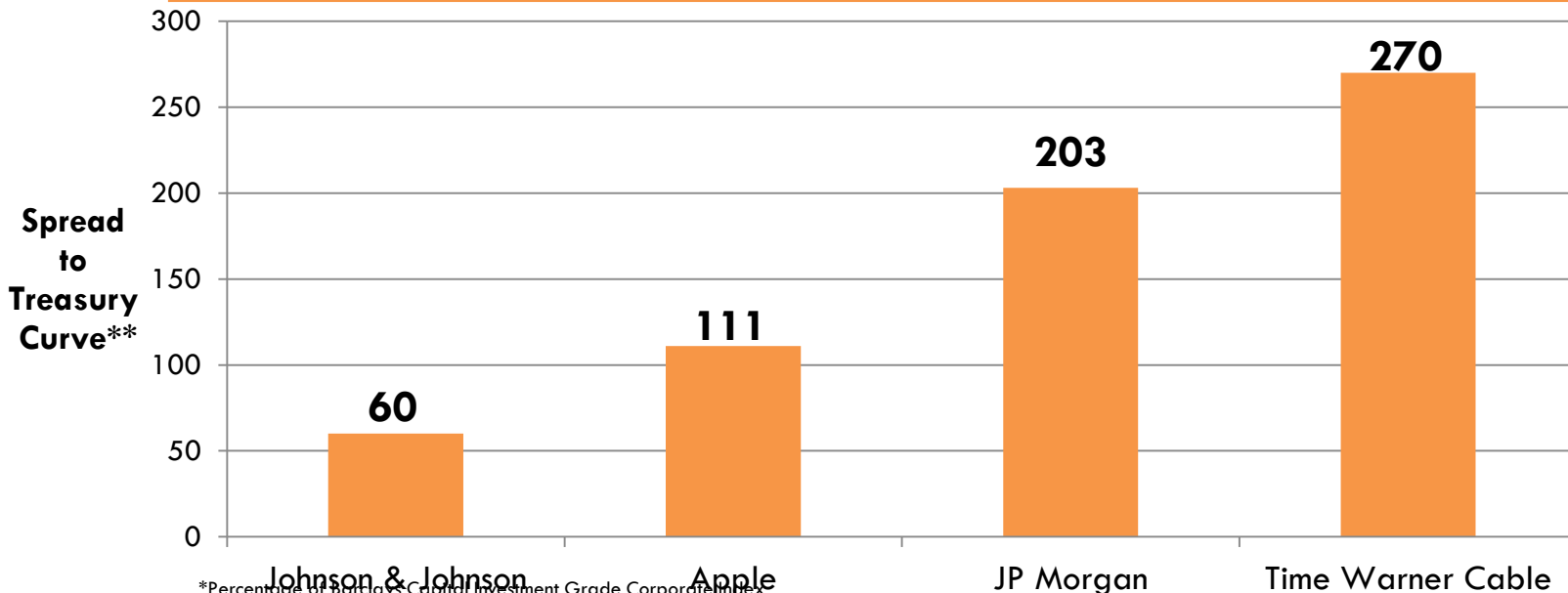


\$4.4 Trillion

Valuation

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Ratings	Examples	% of Index*
AAA	Johnson & Johnson, Microsoft, Exxon Mobil	1.3%
AA	Apple, Wal-Mart, IBM, Chevron	8.4%
A	JP Morgan, Wells Fargo, Pepsi, Target	45.0%
BBB	Time Warner Cable, AT&T, Ford Motor Credit, Freeport-McMoRan	45.3%



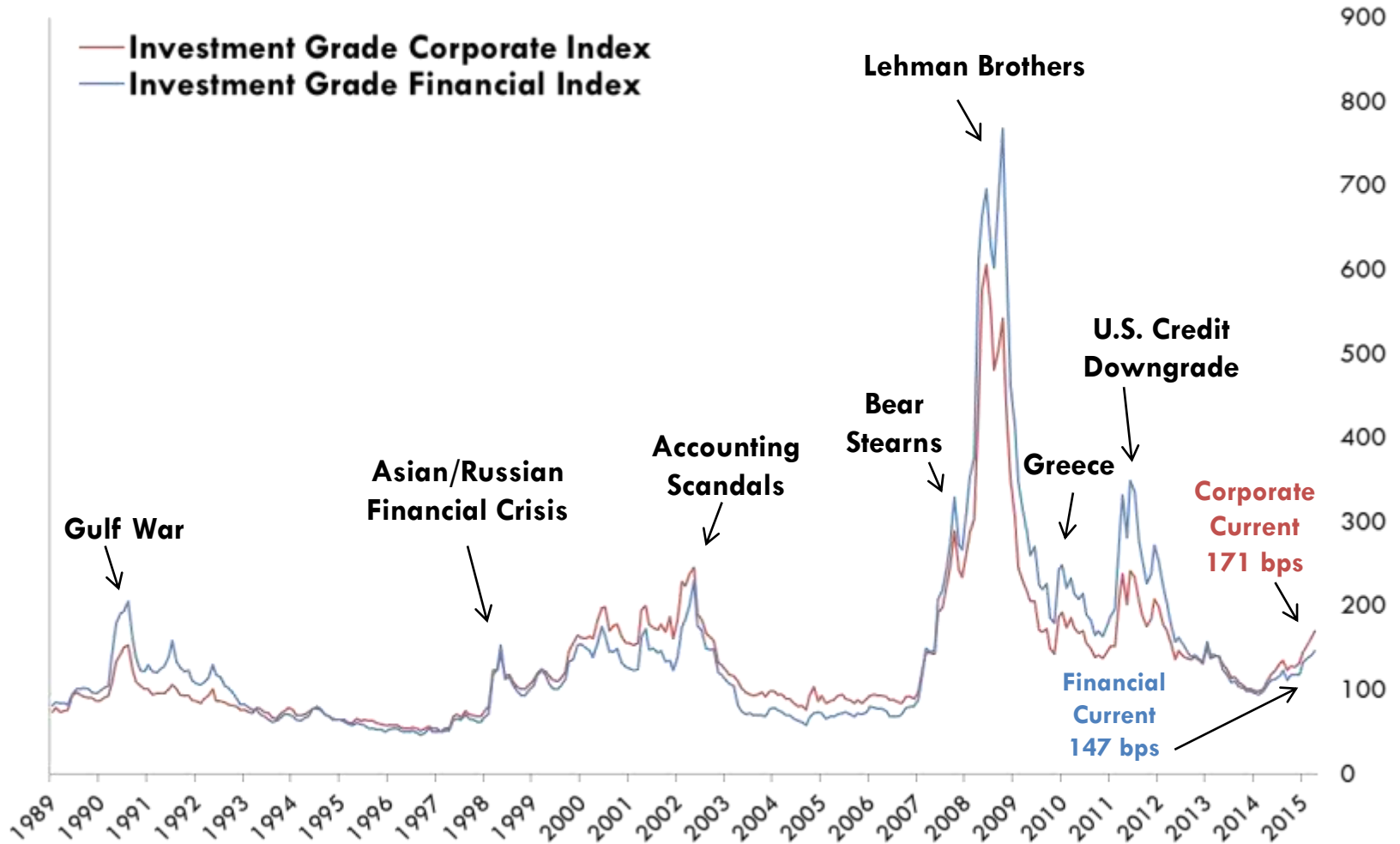
*Percentage of Barclays Capital Investment Grade Corporate Index

**Ten Year Corporate Bond Yield minus Interpolated Government Yield.

Source: Bloomberg, BarCap Live
As of 9/30/2015

Average Option Adjusted Spreads (OAS)

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Market Developments

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- **Electronic Trading**
- **TRACE Data**

Electronic Trading

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- ❑ Price transparency and operational efficiency
- ❑ Diminished relationships and less proactive sales force
- ❑ Dark pool liquidity

TRACE Example - Corporates

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AAPL 3.45 05/06/24

AAPL 3.45 05/06/24 Corp 1) Actions 97) Settings Page 1 Trade/Quote Recap

Trade Recap Quote Recap

From 07:00:00 09/15/15 Source TRAC Show Ticks All Cond Code Definitions

To 16:30:00 09/30/15 95 Buy 98 Sell

Date	Time	Size(M)	Price	Yield	RPS	RPT	CPT	Sprd	Benchmark	CC	Trd Date	Trd Time	Act
		> 100			All								
09/30	15:23:15	450	↑103.436	2.993	S	D	C	95.0	T 2 08/15/25		09/30	15:23:13	
09/30	15:22:03	200	↑103.275	3.014	B	D	C	97.1	T 2 08/15/25		09/30	15:20:00	
09/30	14:17:04	11400 e	↑103.153	3.030	B	D	C	97.8	T 2 08/15/25		09/30	14:13:18	
09/30	13:58:41	150	↑103.321	3.008	S	D	D	94.9	T 2 08/15/25		09/30	13:58:40	
09/30	12:49:49	250	↑103.000	3.050	B	D	C	97.9	T 2 08/15/25		09/30	12:49:37	
09/30	12:18:12	245	↓103.122	3.034	B	D	C	97.2	T 2 08/15/25		09/30	12:18:09	
09/30	10:12:18	200	↑103.244	3.018	S	D	C	95.2	T 2 08/15/25		09/30	10:12:14	
09/30	07:47:26	109	103.069	3.041	S	D	D	95.9	T 2 08/15/25		09/30	07:47:10	
09/30	07:47:20	109	↑103.069	3.041	S	D	D	95.9	T 2 08/15/25		09/30	07:47:19	
09/30	07:24:02	300	103.056	3.043	S	D	D	95.9	T 2 08/15/25		09/30	07:23:38	
09/30	07:23:53	300	↓103.056	3.043	S	D	D	95.9	T 2 08/15/25		09/30	07:23:52	
09/29	13:48:28	1000	↓103.109	3.036	B	D	C	98.1	T 2 08/15/25		09/29	13:48:25	
09/29	13:45:38	125	↑103.700	2.959	S	D	C	90.0	T 2 08/15/25		09/29	13:42:33	
09/29	11:07:22	160	↑103.677	2.962	S	D	C	90.7	T 2 08/15/25		09/29	11:07:17	
09/28	15:04:38	485	↑103.028	3.047	S	D	D	94.9	T 2 08/15/25		09/28	15:04:18	
09/28	15:04:33	485	↓102.978	3.053	B	D	C	95.6	T 2 08/15/25		09/28	15:04:18	
09/28	13:33:01	180	↓103.424	2.995	S	D	C	90.3	T 2 08/15/25		09/28	13:32:28	
09/28	11:22:32	450	↓103.294	3.012	S	D	C	91.3	T 2 08/15/25		09/28	11:22:30	
09/28	09:29:11	500	↓102.813	3.075	B	D	C	95.1	T 2 08/15/25		09/28	09:29:04	

Zoom - + 100%

Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2015 Bloomberg Finance L.P.
 SN 145985 CST GMT-6:00 H145-3605-3 17-Nov-2015 11:09:15

TRACE Example - Mortgages

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Enter all values and hit <Go>, 2<Go> to save settings as your default view

1) View 2) Actions 3) Hide Filters TRACE Activity

3 Corp Bonds 4 Agencies 5 Mortgage TBA 6 Mortgage Pool 7 ABS 8 Convertibles 9 ELNs

Agency All WAC Period Today As of 11:43
 Prop Type All WAM Side All
 Amort Type All WALA 48 Loan Size -
 Maturity <360 Size All Size OLTV Coupon 5 - 6

Agency	Prop Type	Cpn	Mty	Amort Ty	WAC	WAM	WAL	LSiz	OLTV	R	C	S	Size(Price	Trd#	Volume(M	Time
															32	31,013	
Fannie Mae	Single Famil	5.5	180	Level Pa	5.9	80	90	25	50	D	C	B	20	105-05	1	20	12:33
Fannie Mae	Single Famil	5.5	180	Level Pa	6	70	100	75	50	D	C	B	1	99-00	1	1	12:33
Ginnie Mae II	Single Famil	5.5	180	Level Pa	6	60	110	25	75	D	C	B	125	104-28	1	125	12:33
Fannie Mae	Single Famil	5.5	180	Level Pa	6	60	110	0	50	D	C	B	3	99-17	2	173	12:33
Fannie Mae	Single Famil	5.5	180	Level Pa	5.9	70	110	0	50	D	C	B	13	100-00	1	13	12:28
Freddie Mac	Single Famil	5.5	180	Level Pa	5.9	60	120	0	50	D	C	B	6	100-00	2	206	12:28
Fannie Mae	Single Famil	5.5	180	Level Pa	5.9	60	120	50	50	D	C	B	3261	106-21	1	3,261	12:26
Freddie Mac	Single Famil	5.5	180	Level Pa	6	70	100	50	50	D	C	B	1000	108-06	1	10,000	12:23
Fannie Mae	Single Famil	5	240	Level Pa	5.5	110	130	50	50	D	C	B	100	105-24	2	200	12:19
Freddie Mac	Single Famil	5	180	Level Pa	5.6	50	120	0	50	D	C	B	5	101-24	1	5	12:08
Fannie Mae	Single Famil	5	180	Level Pa	5.5	20	150	0	50	D	C	B	36	100-16	1	36	12:07
Fannie Mae	Single Famil	5	180	Level Pa	5.4	20	150	0	50	D	C	B	3225	103-00	2	6,450	11:55
Ginnie Mae I	Single Famil	5	180	Level Pa	5.5	20	150	0	75	D	C	B	42	103-15	1	42	11:35
Ginnie Mae II	Single Famil	5	180	Level Pa	5.3	30	150	0	75	D	C	B	40	103-15	1	40	11:35
Fannie Mae	Single Famil	5	180	Level Pa	5.5	80	90	0	50	D	D	S	70	106-01	2	140	11:34
Fannie Mae	Single Famil	5.5	180	Level Pa	6	80	100	0	50	D	C	B	9	98-16	1	9	11:02
Freddie Mac	Single Famil	6	180	Level Pa	6.5	60	110	0	50	D	C	S	1825	109-20	1	1,825	11:01
Ginnie Mae I	Single Famil	6	240	Level Pa	6.5	90	140	25	75	D	C	B	170	107-16	1	170	10:35
Freddie Mac	Single Famil	5.5	180	Level Pa	6	80	90	0	50	D	C	B	250	106-16	1	250	10:35

Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2015 Bloomberg Finance L.P.
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Conclusion

- Historically, investment grade fixed income has provided a high risk-adjusted return relative to other asset classes
- The composition of the market has changed over time, which has created both risks and opportunities
- Recent market developments have increased transparency in the bond market