Introduction to the Valuation of Unquoted Loans

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15 February 2017

Important Notice

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Agenda

1. Loan Markets
2. Loan Valuation Basics
3. Credit Quality
4. The Loan Discount Rate
5. Loan Valuation Examples

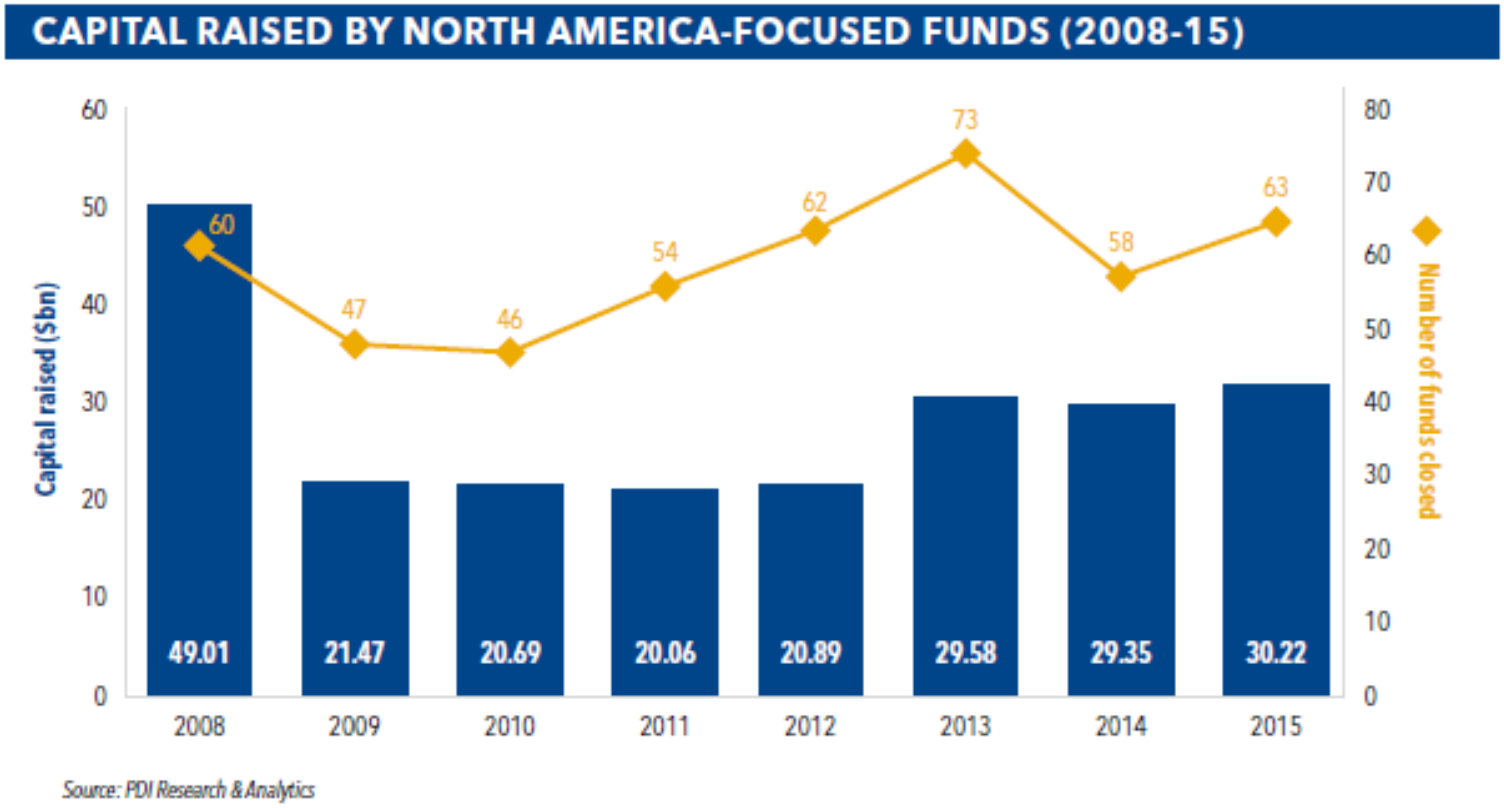
Valuing a Loan

First of all, some concepts and terminology

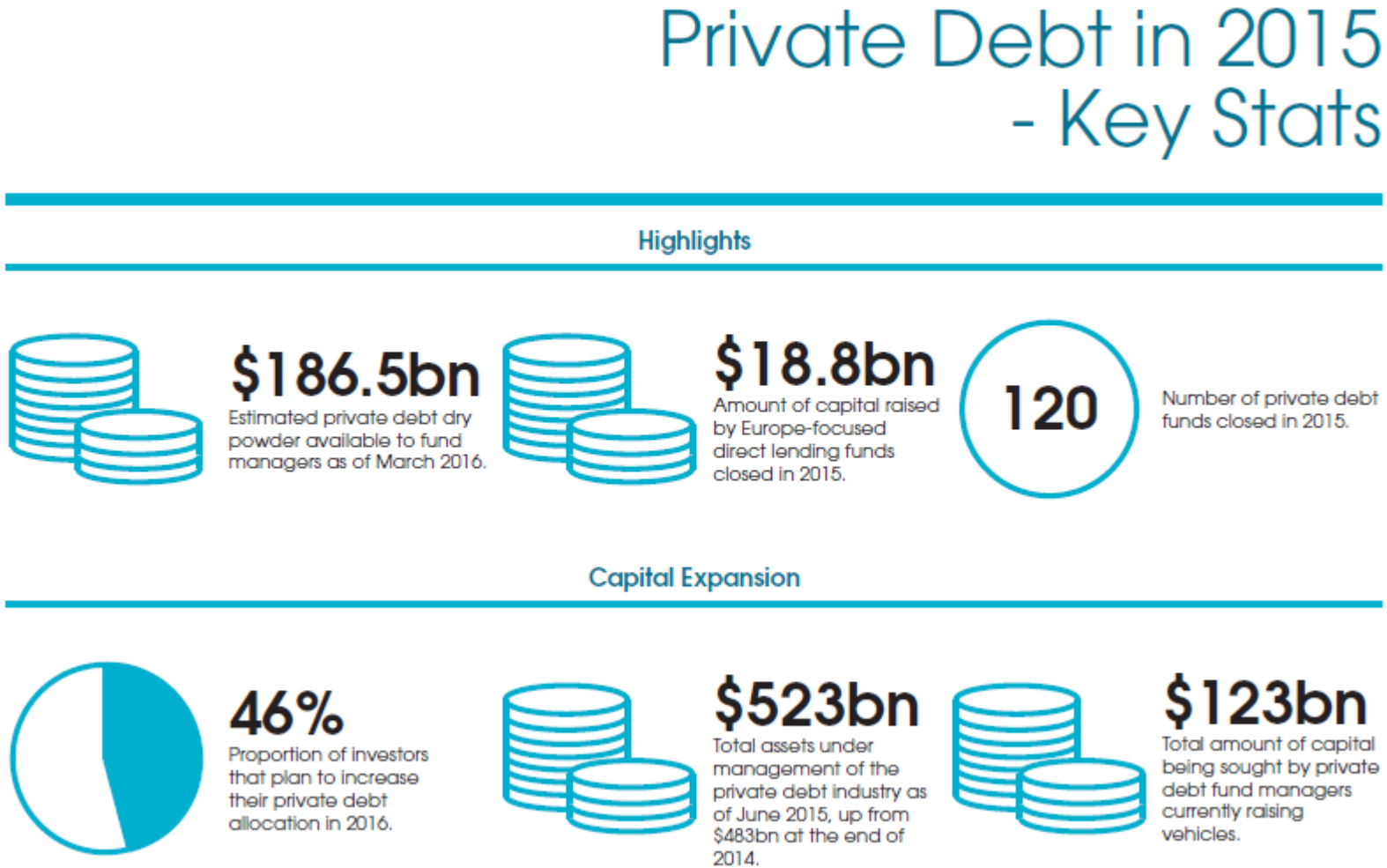
- **A Loan :** an agreement to pay back an amount in full for a price (interest). Commonly referred to as a Credit or a bond.
- **Value :** market or fair value implying rational willing buyers and sellers. Consistent with fair value for financial reporting.
- **Unquoted Loans :** loans which have no observable market price or credit rating
- **Curves and yields :** as in yield curves – the market interest rates at different points in time. Corporate and Sovereign (Gov't) bond yields can be observed from yield curves of similar maturity.
- **Spread:** the yield above a benchmark interest rate such as that on Gov't bond.
- **Maturity :** term of the loan
- **Par :** the face value of a bond usually 100% at issue. Prices of bonds are quoted as a % of par. Bond prices and yields move in the opposite direction.
- **Ratings :** rankings of the quality of borrower entities and individual loans performed by rating agencies (S&P, Moody's etc). AAA top of the table, BBB mid table, CCC in the relegation zone. **This presentation focuses on BBB and below which is where many unquoted credits start life. Known as High Yield Loans.**

1. Loan Markets

Loan Markets
Introduction



Loan Markets
Introduction



Source : Prequin

Loan Markets

Segments

Private debt comprises Mezzanine and other forms of debt financing that comes mainly from institutional investors such as funds and insurance companies but not from banks.

Private debt instruments are generally illiquid and do not trade via organized markets.

- **Senior Debt:** first ranking secured loan used mainly to finance buyout transactions and growth funding. Returns generated mainly by interest payments.

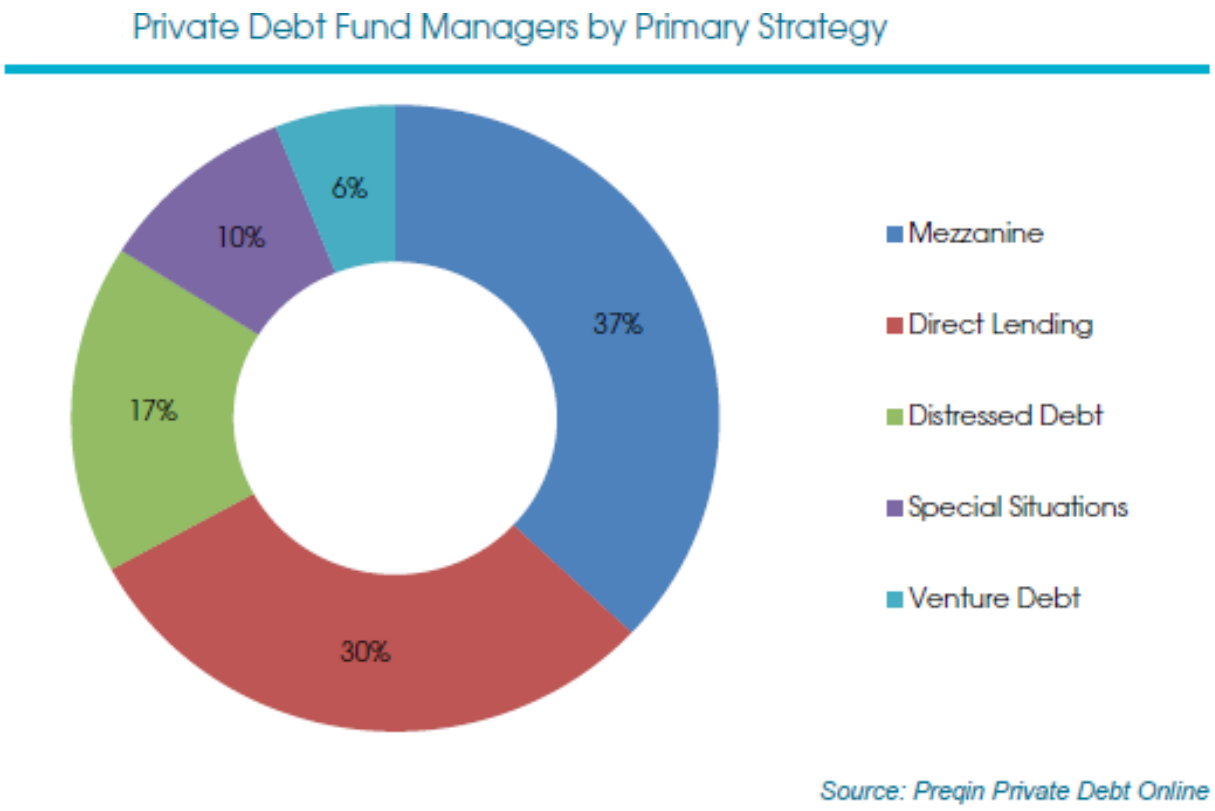
- **Mezzanine:** intermediate funding between debt and equity used mainly for buyouts and growth funding and is often subordinate to bank debt. Returns generated from interest payments and equity kickers such as warrants

- **Credit Opportunities**: funds that invest in a wide variety of financing structures and situations. Funding of complex refinancings of companies cut off from capital markets for various reasons. Also specialize in secondary transactions

- **Distressed Debt :** funds which buy mostly senior secured loans in the secondary market at a discount to face value. Aim to acquire sound assets in situations which companies have run into financial difficulties.

Loan Markets

Introduction



Source: Preqin Private Debt Online

Loan Markets

Segments

Four main motives why institutions invest in private debt:

- Attractive stable spreads: private debt and Mezzanine offer attractive spreads over sovereign debt, corporate bonds and high yield securities
- Low correlation with traditional assets classes
- Stable performance across market cycles
- Established and experienced asset managers

Loan Markets

Returns

Returns from Equity and Debt Markets

	1800 - 2010	
	annual	10 years
Equity Markets	8.0%	216%
Bonds	4.8%	160%
T Bills	4.1%	149%

Note: cummulative total returns

Source: Research, rating agencies, analyst estimates.

- Ibbostson/Morningstar, Duff & Phelps, Damodaran and others suggest long term (20+ years) US equity market risk premium of 5+% and US Gov't bond yields of c4%.

Loan Markets

Returns

High Yield returns

US	1995 - 2015
Corporate	180%
BB	181%
B	148%
CCC	212%
Europe	
Corporate	153%
BB	224%
B	152%
CCC	146%

Annualised
6.1%
6.1%
4.0%
7.8%

Note: cummulative total returns

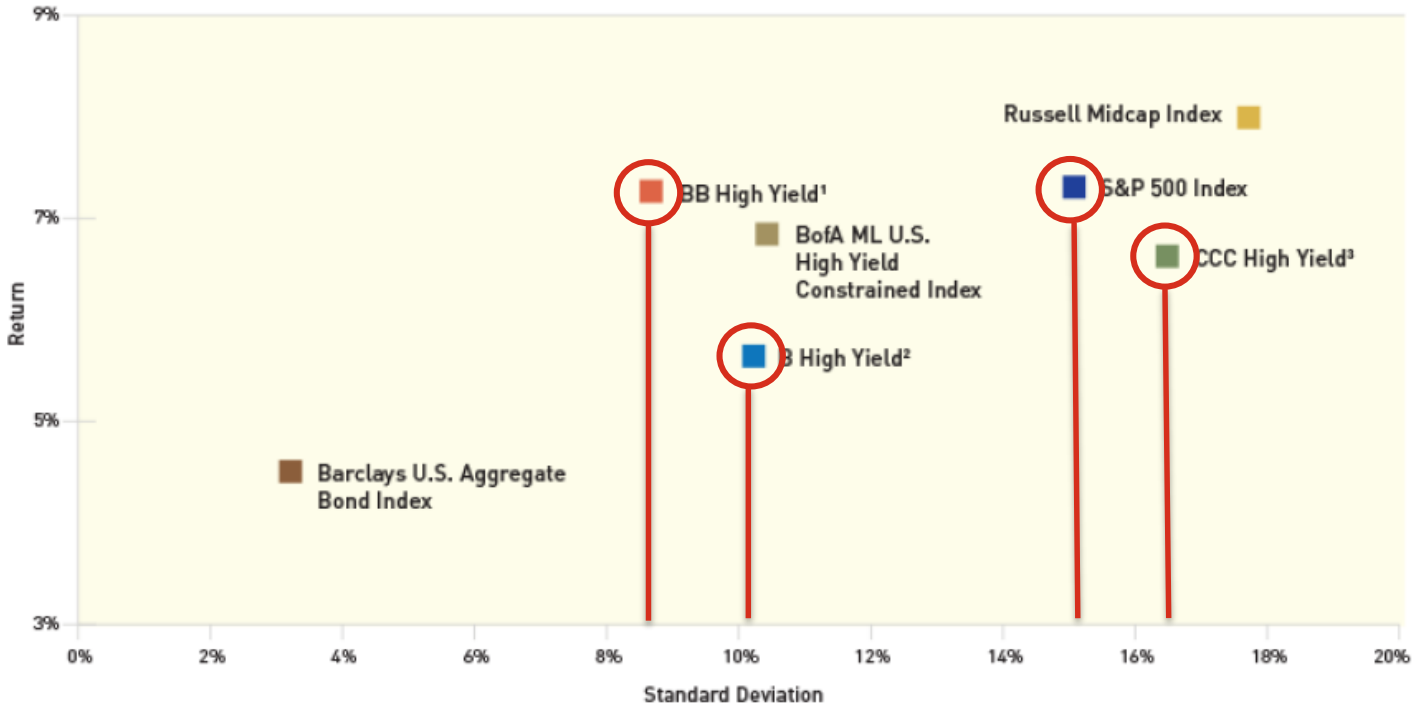
Source: Research, rating agencies, analyst estimates.

Loan Markets

Returns

Chart 1. As an Asset Class, High Yield Sits Midway on the Risk/Reward Spectrum between Fixed Income and Equity

10-year historical data, as of 12/31/15



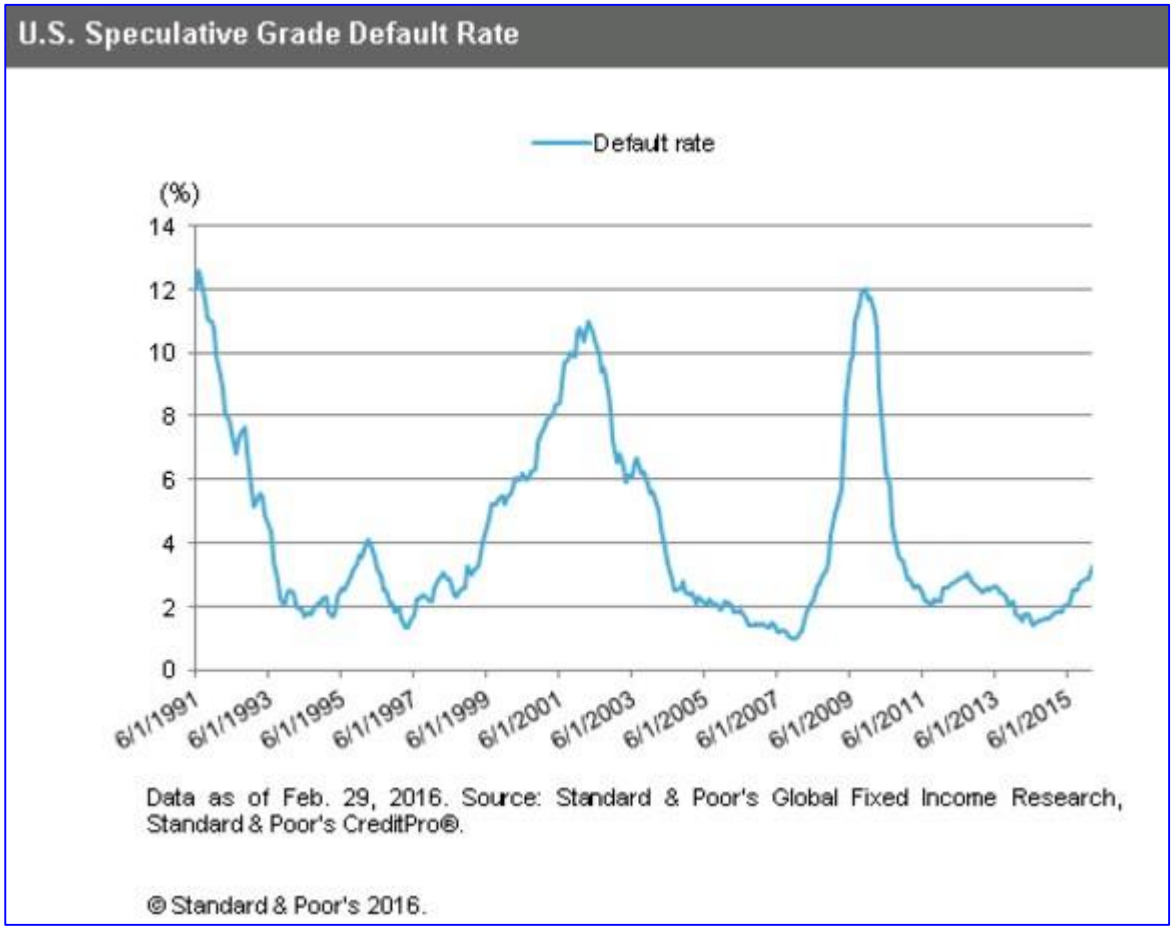
Sharpe **ratio** measures the excess return (or risk premium) per unit of deviation in an investment asset. Std deviation is the typical measure of risk,

Source: Zephyr and Lord Abbett.

[1]BB High Yield as represented by the BofA Merrill Lynch BB U.S. High Yield Index. [2]B High Yield as represented by the BofA Merrill Lynch Single B U.S. High Yield Index. [3]CCC High Yield as represented by the BofA Merrill Lynch CCC & Lower U.S. High Yield Index.

Loan Markets

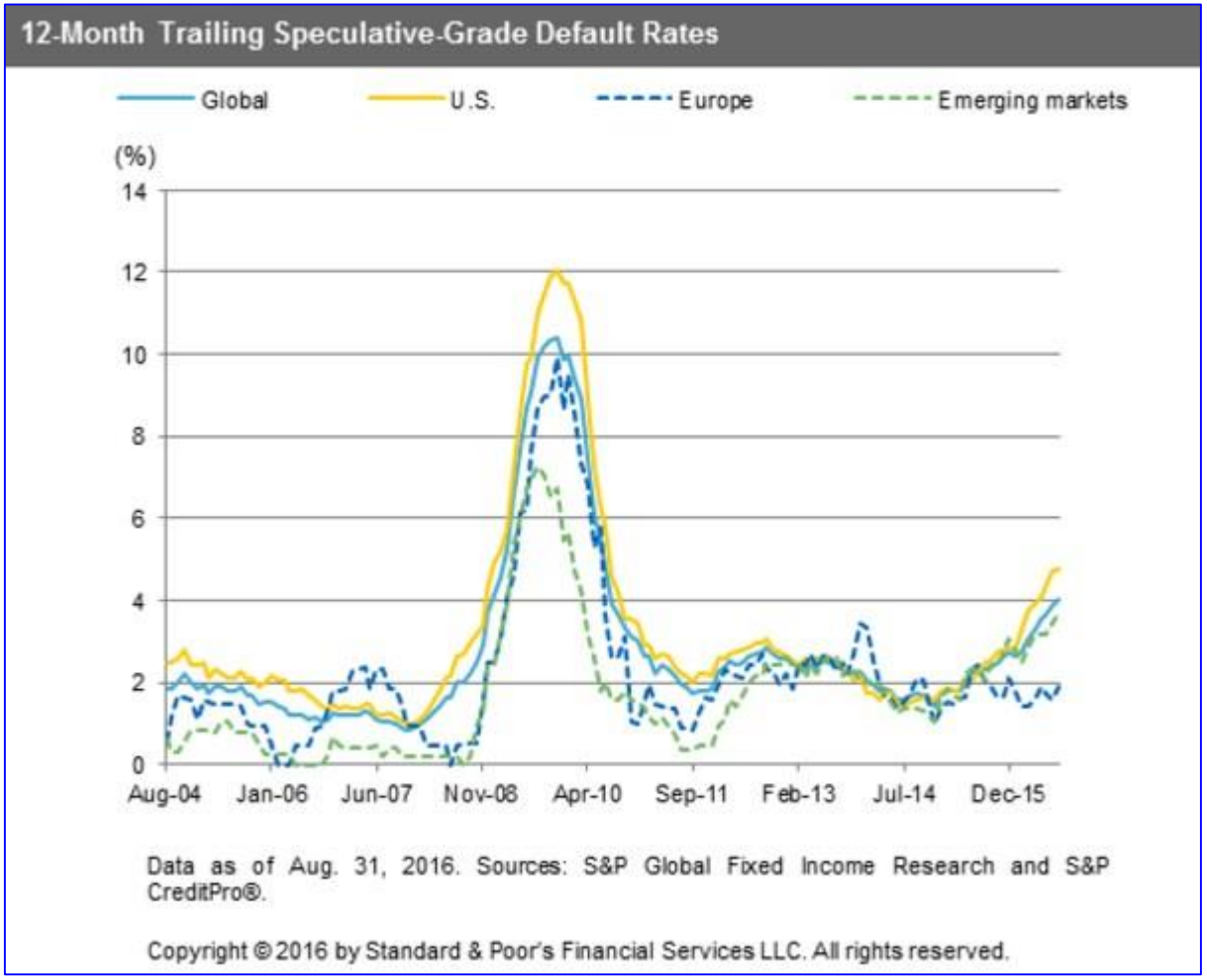
Default



Source: highyieldbond.com

Loan Markets

Default



Source: highyieldbond.com

Loan Markets

Cumulative Default

Rating	Estimated Cumulative Default	
	5 years	20 years
AAA	< 1%	c2%
AA	< 1%	c2.5%
A	< 1%	c3%
BBB	< 2%	c7%
BB	c7%	c20%
B	c20%	c30%
CCC	c45%	c55%

Source: Research, rating agencies, analyst estimates.

Loan Markets
Default

S&P **Default** (D)

- When **S&P believes that the borrower will fail to pay all or substantially all of its obligations** as the become due.

S&P **Selective Default** (SD) :

- A borrower has **selectively defaulted** on a specific loan or class of loans but will continue to meet obligations on other issues or classes in timely manner.
- Includes a **distressed exchange** where a loan is repurchased for cash or replaced by another loan for less than the par value of the previous loan.

Source: S&P, 2015.

Loan Markets

Default

Moody's defines three types of credit events:

- A **missed or delayed disbursement** of interest and / or principal including delayed payments made within a grace period.
- **Bankruptcy, administration, legal receivership** or other legal blocs to the timely payment of interest and or principal.
- A **distressed exchange** occurs where:
  - The issuer offers a new security that is a diminished financial obligation (such as preferred or common stock, or debt with a lower coupon or par amount, lower seniority or longer maturity; or
  - The exchange had the purpose of helping the borrower avoid default

Source: Moody's.

Loan Markets

Recovery

Rating	Estimated Recovery
First Lien	+50%
Second Lien	+45%
Senior Unsecured	+30%
Senior Subordinated	+25%
Subordinated	+25%
Junior Subordinated	<20%

Source: Research, rating agencies, analyst estimates.

Loan Markets

Recovery

Default & Recovery Rates for High-Yield Bond Defaults, 2014-2016 (5/23)

	Default Rate	Overall Recovery Rate	Energy/Mining Recovery Rate	All Other Recovery Rate
2014	2.11%	63.19	n/a	63.19
2015	2.83%	33.91	25.64	46.78
2016 (5/23)	2.74%	18.18	16.55	33.60
Weighted Average Default Rate (1971-2015)			3.44%	
Arithmetic Average Recovery Rate (1978-2015)			46.01	

9

NYU STERN

Source: NYU Stern

2. Loan Valuation Basics

Valuing a Loan

Basics:

- **Approach : Loans are valued using a Discounted Cash Flow. The key is the discount rate or 'yield'**

- Typical Senior Loan terms:
  - Amount: €50m
  - Term : 6 Years
  - Fixed rate 7.5% p.a.
  - Or Libor + 6.5%, 1% floor
  - Bullet repayment

Senior Loan		2017	2018	2019	2020	2021	2022
€m							
Balance		50	50	50	50	50	50
Interest		7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Interest		3.75	3.75	3.75	3.75	3.75	3.75
Amortisation		0	0	0	0	0	0
Principal repayment							50
Cash flow		3.75	3.75	3.75	3.75	3.75	53.75
Discount rate	7.80%						
Discount factor		0.93	0.86	0.80	0.74	0.69	0.64
PV of Cash flows		3.48	3.23	2.99	2.78	2.58	34.25
Total present Value	49.3						
% of par	98.6%						

- **Discount rate 7.8%** — **% of par 98.6% = Market Value or Fair Value of €49.3m**

- **Discount rate 7.2%** — **% of par 101.4.0% = Market Value or Fair Value of €50.7m**

Valuing a Loan

Basics: the Discount Rate - yields

- **Yield to maturity (YTM)**
  - The rate of return, expressed as an annual % rate, earned by investing in a bond and holding it to maturity.
  - Also referred to as IRR or yield, it measures the return for bond investment risk: credit, liquidity, interest rate, default, among others
  - It is the % rate used to discount a bond's: (a) interest and : (b) principal repayment cash flows to present value.
  - 3 sources of cash flow and yield: interest from coupon; capital gain on bond price at maturity; and reinvestment of coupons which is assumed to occur at the same yield but which is, in fact, unknown (reinvestment risk).

- *Yield to call*: same as YTM except that the call price at the call date goes in the cash flow in place of the principal repayment at maturity. Call is exercised by the investor if a bond is trading at a premium to the call price.
- *Yield to put*: exercised if a bond trades at a discount to the put price
- *Yield to worst:* yield to first call (there may be more than one call price and date). For option free bonds, YTM = YTW.

Valuing a Loan

Basics: spreads above base yields

- **Nominal:** YTM less YTM of the benchmark e.g Treasury.

- **Zero volatility spread:** the spread that must be added to each point of the Treasury yield curve to make the present value of the bond cash flows = the market price. (Z spread).

- **Option Adjusted Spread – OAS**: bonds with options have higher yields than option free bonds as they offer additional yield to pay for the call/put options. OAS removes the option yield component from the Z spread and so OAS is the spread the bond would have if the option characteristics were removed. For a callable bond, Z spread less OAS = cost of option. (OAS – Z spread for puttable bonds).

Valuing a Loan

Introducing PLC

- An energy sector company operating since early ’90s. Excellent products, international customer base, and management team
- In excellent shape - sales:$50 – 60m, EBITDA €20 - 25m
- Nearly $100m of net tangible assets; debt of about $40m (ie c2x leverage)
- Bought by a PE house for c8x – 9x EBITDA valuing 100% of the share capital of the company at c$150m
- Buyer raised $100m+ of debt to support the acquisition (LBO)
- Following the buyout, PLC had total debt (senior and revolving) of $120m and was projecting leverage of >4x for the year against a total leverage covenant of +5x
- Debt facilities were priced at Libor +4.5% - Libor +5%

3. Credit Quality

Credit Quality

The first step in selecting the discount rate: **assessing the credit quality or risk** of the borrower

- **Credit Risk:** *arises from the potential that a borrower will fail to perform an obligation* (Federal Reserve)
- *Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms* (Bank for International Settlements).
- The four Cs of Credit Quality assessment:

- **Character:** The borrower's reputation or track record for repaying debts (credit history), as well as reputation of the Board and management executives.

- **Capacity:** measures a borrower's ability to repay a loan by comparing income against recurring debts and assessing the borrower's solvency by looking at Debt/Equity Ratio and interest and debt service cover ratios

- **Collateral:** The quality and value of the collateral pledged and unpledged

- **Covenants:**
  - Negative covenants**:**
    - Restrictions on asset sales
    - Negative pledge of collateral
    - Restrictions on additional borrowings
  - Affirmative covenants:
    - Maintenance of certain financial ratios (e.g. Total Debt/ EBITDA)
    - Timely payment of interest and principal

Credit Rating

	S&P	Moody's	
Investment Grade	AAA	Aaa	High quality borrowers, almost no credit risk
	AA+	Aa1	High quality borrowers, very little credit risk
	AA+	Aa2	
	AA-	Aa3	
	A+	A1	Good-to-high quality borrowers, with little credit risk
	A	A2	
	A-	A3	
	BBB+	Baa1	Medium credit quality borrowers, with some credit risk
	BBB+	Baa2	
	BBB-	Baa3	
High Yield	BB+	Ba1	Borrowers with 'speculative elements' and significant credit risk
	BB	Ba2	
	BB-	Ba3	
	B+	B1	Speculative with high credit risk
	B	B2	
	B-	B3	
	CCC+	Caa1	Poor quality borrowers with high/very high credit risk
	CCC	Caa2	
	CCC-	Caa3	
	CC	Ca	Poor quality borrowers that are very close to default if not already in default
	C	C	Borrowers in default with little in any prospect of recovery

Credit Quality

PLC

	Weight	Sub factor	Sub weight	PLC Data	Score	Weighted score	Rating
1. Scale	20%	EBITDA	10%	$25 - 100m	18	1.8	Caa
		Assets	10%	< $0.5bn	20	2	Ca
2. Business profile	25%		25%	Global competitor; diversified, new assets; little EBITDA concentration risk; long track record of operational expertise; modest EBITDA volatility driven by industry cycles	9	2.25	Baa - Ba
3. Profitability & efficiency	20%	EBIT Margin	10%	26%	9	0.9	Baa
		EBIT/Assets	10%	26%	3	0.3	Aa
4. Leverage & Coverage	20%	EBITDA / Interest	10%	4.7x	12	1.2	Ba
		Debt /EBITDA	10%	4.1x	12	1.2	Ba
5. Financial Policy	15%		15%	Expected to have financial policies that balance the interest of creditors and shareholders; some risk that debt funded acquisitions or shareholder distributions could lead to a **weaker credit profile**	9	1.35	Baa - Ba
Total score						**11.00**	

Overall : Ba1 to Ba2 or BB+ to BB

Upper end of non-investment grade.

Credit Quality

From the point of view of a valuer, getting **good quality information is challenging**:

1. Terms of the loan and use of proceeds and any change of either since issuance

2. Covenants of the loan and any change

3. Evidence of covenant compliance (leverage and interest cover)

4. Historic, current and projected financial performance of the assets and cash flow of the borrower
   - Assumptions underlying the projections
   - Projected leverage and interest cover
   - Liquidity
   - Value of the collateral

5. Credit monitoring and credit quality assessment process

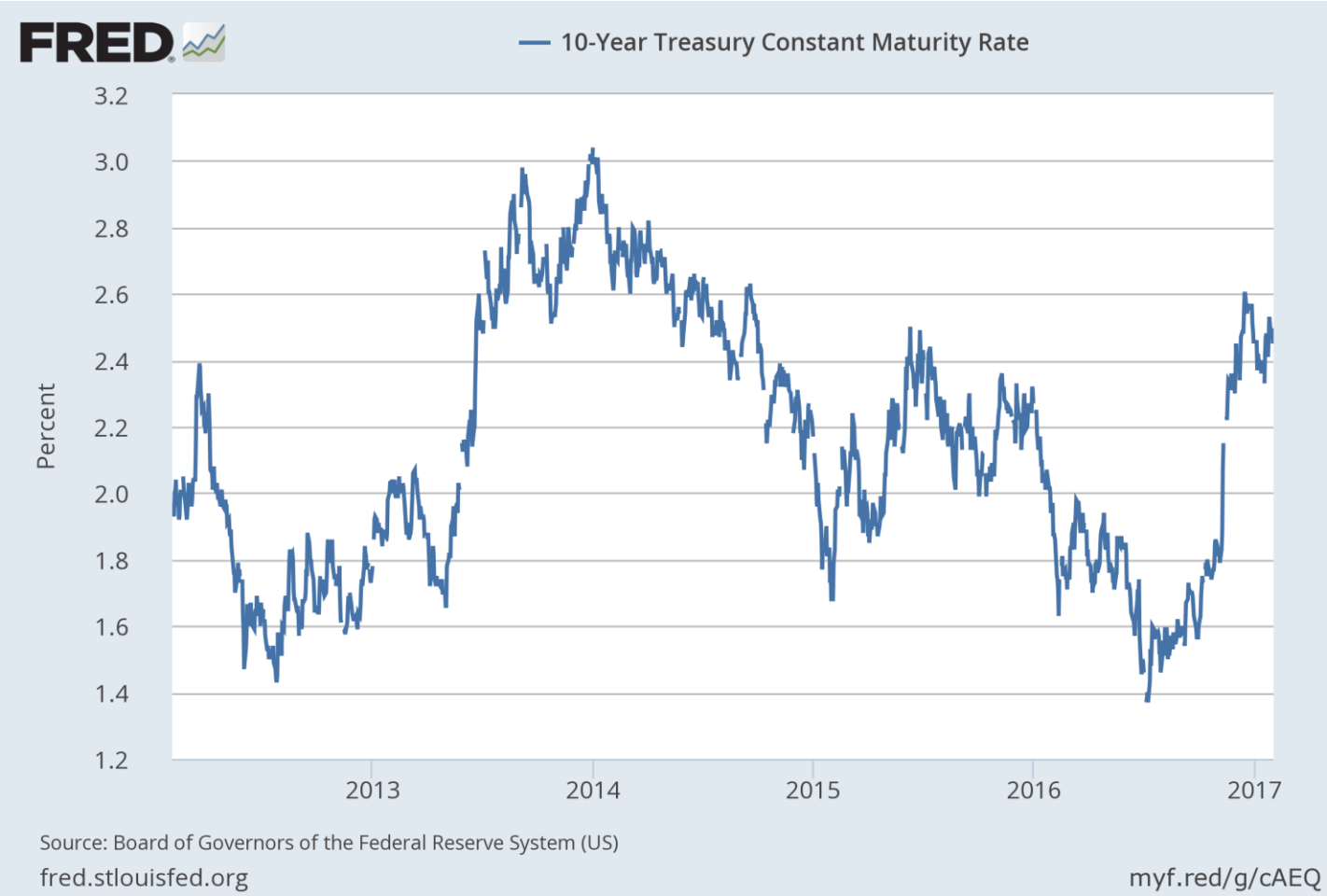
4. The Discount Rate

Yields and Spreads : Estimating the Discount Rate

US Yield and Spread Benchmarks

US Treasury Yields

10 Year Treasuries since 2012



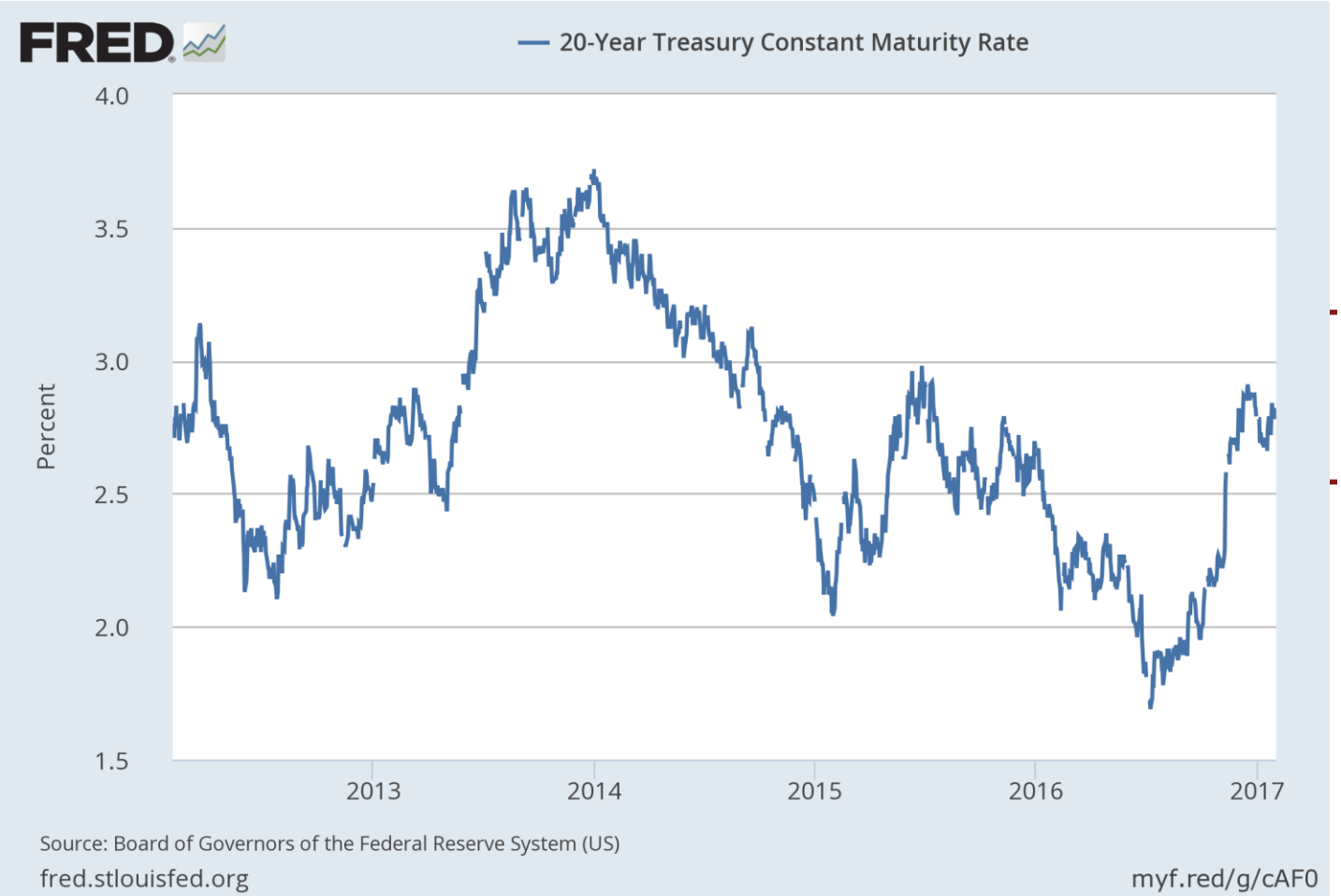
US Average : 2.14%

Feb 2017: 2.48%

https://fred.stlouisfed.org/series/BAMLH0A2HYBEY, February 3, 2017.

US Treasury Yields

20 Year Treasuries since 2012



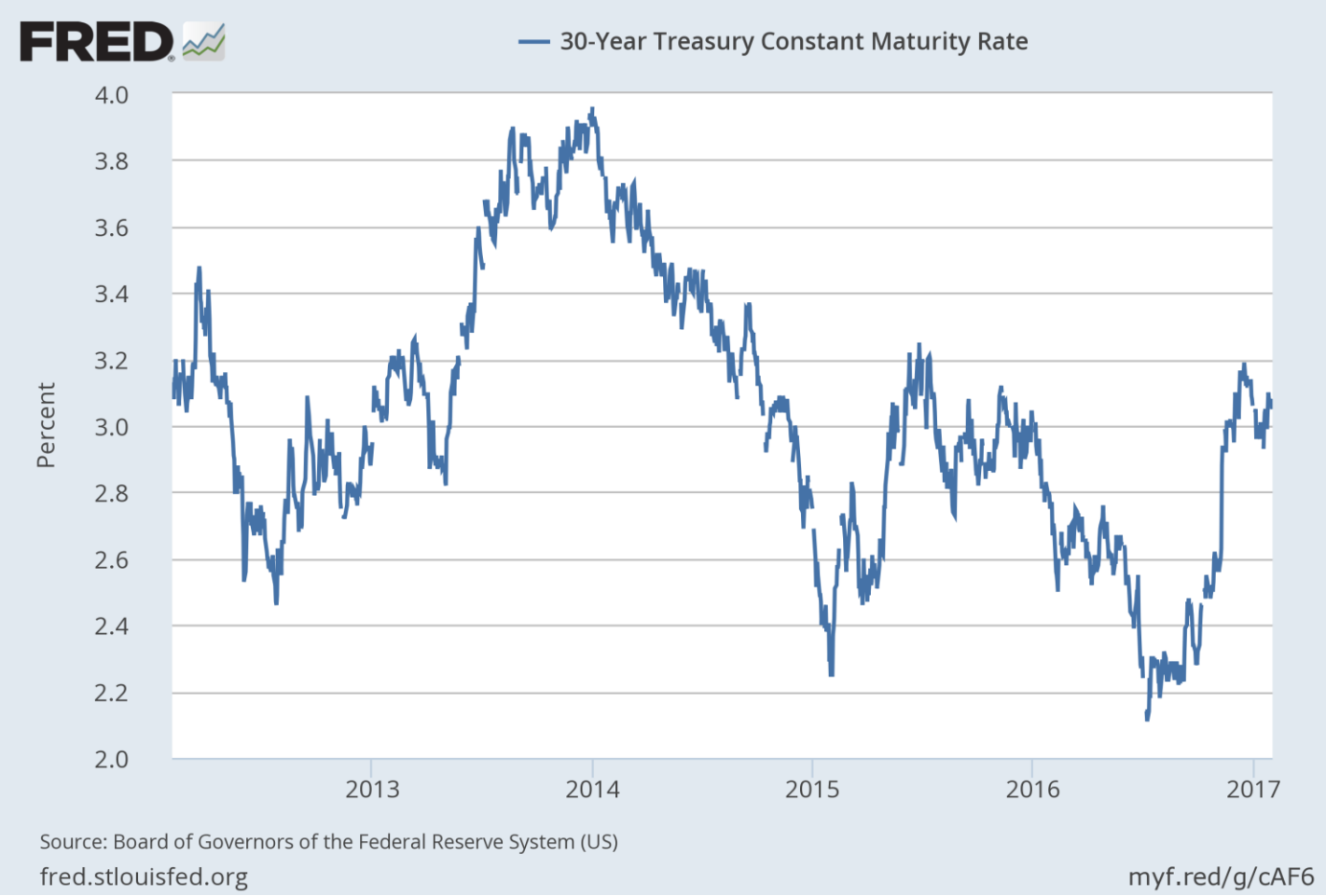
US Average : 2.70%

Feb 2017: 2.80%

https://fred.stlouisfed.org/series/BAMLH0A2HYBEY, February 4, 2017.

US Treasury Yields

30 Year Treasuries since 2012



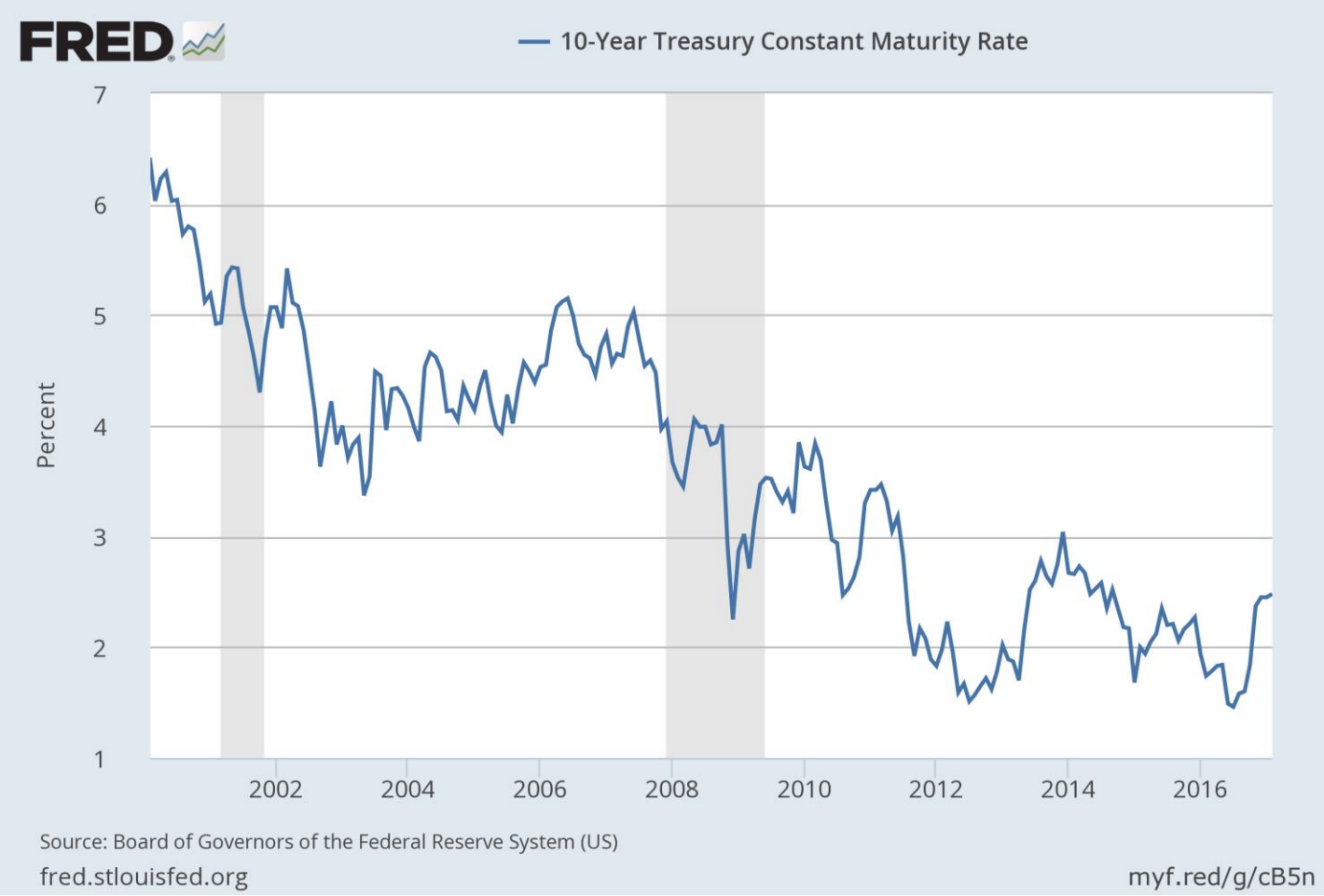
US Average : 2.90%

Feb 2017: 3.08%

https://fred.stlouisfed.org/series/BAMLH0A2HYBEY, February 4, 2017.

US Treasury Yields

10 Year Treasuries since 2000



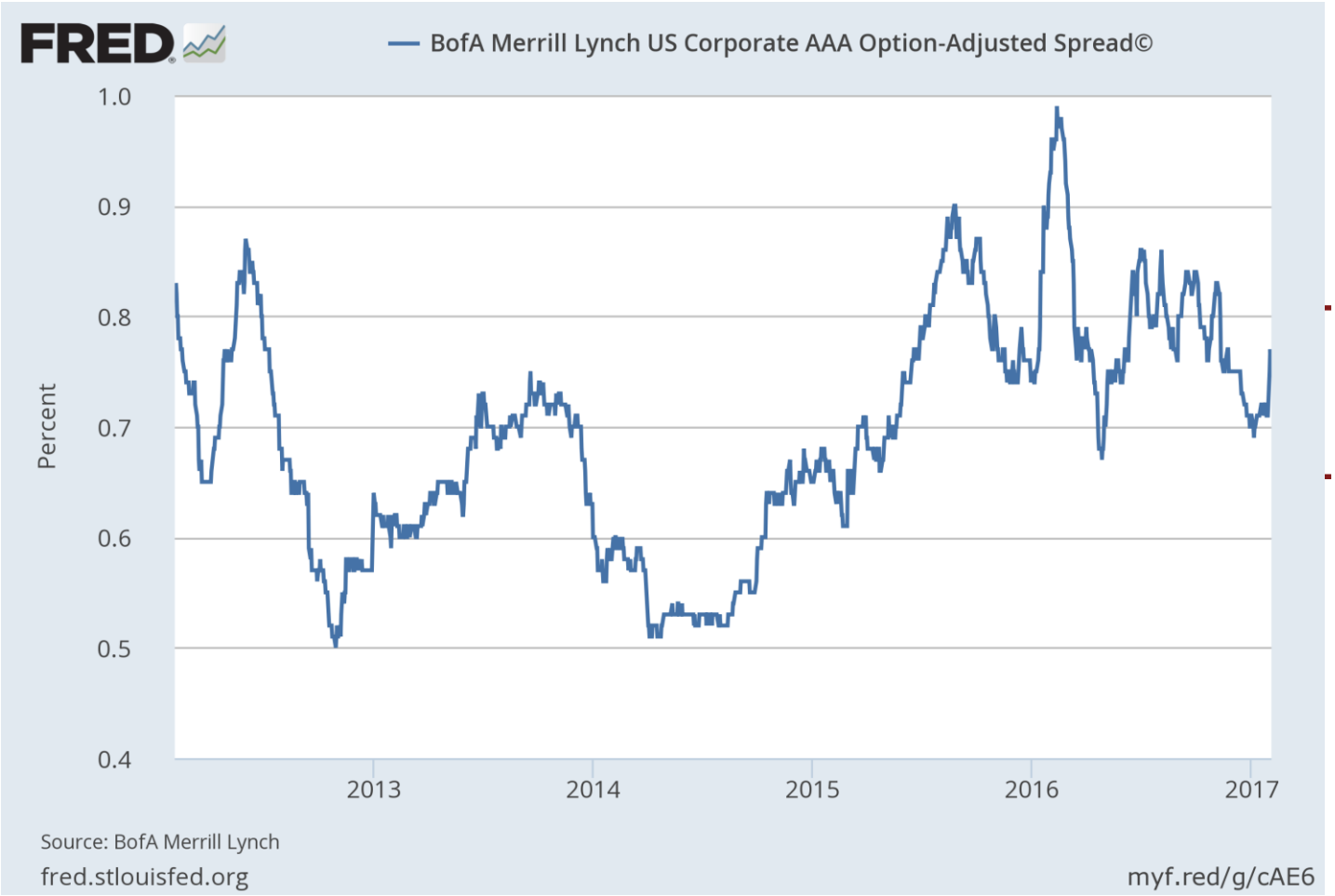
US Average : 3.58%

Feb 2017: 2.48%

https://fred.stlouisfed.org/series/BAMLH0A2HYBEY, February 4, 2017.

US Corporate Spreads

Corporate AAA



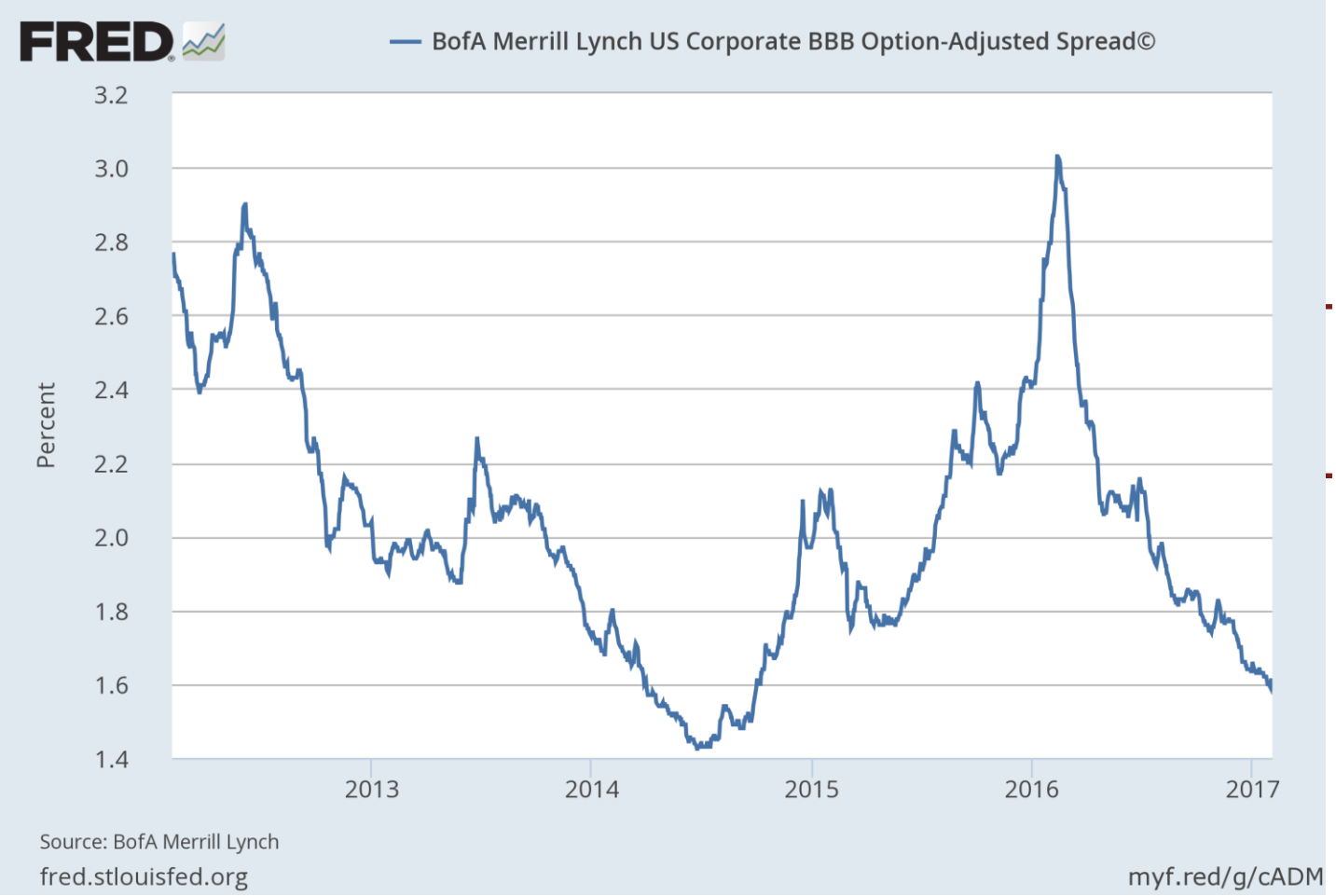
US Average : 0.69%

Feb 2017: 0.75%

BofA Merrill Lynch, BofA Merrill Lynch US Corporate AAA Option-Adjusted Spread© [BAMLC0A4CBBB], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/BAMLC0A4CBBB, February 4, 2017.

US Corporate Spreads

Corporate BBB



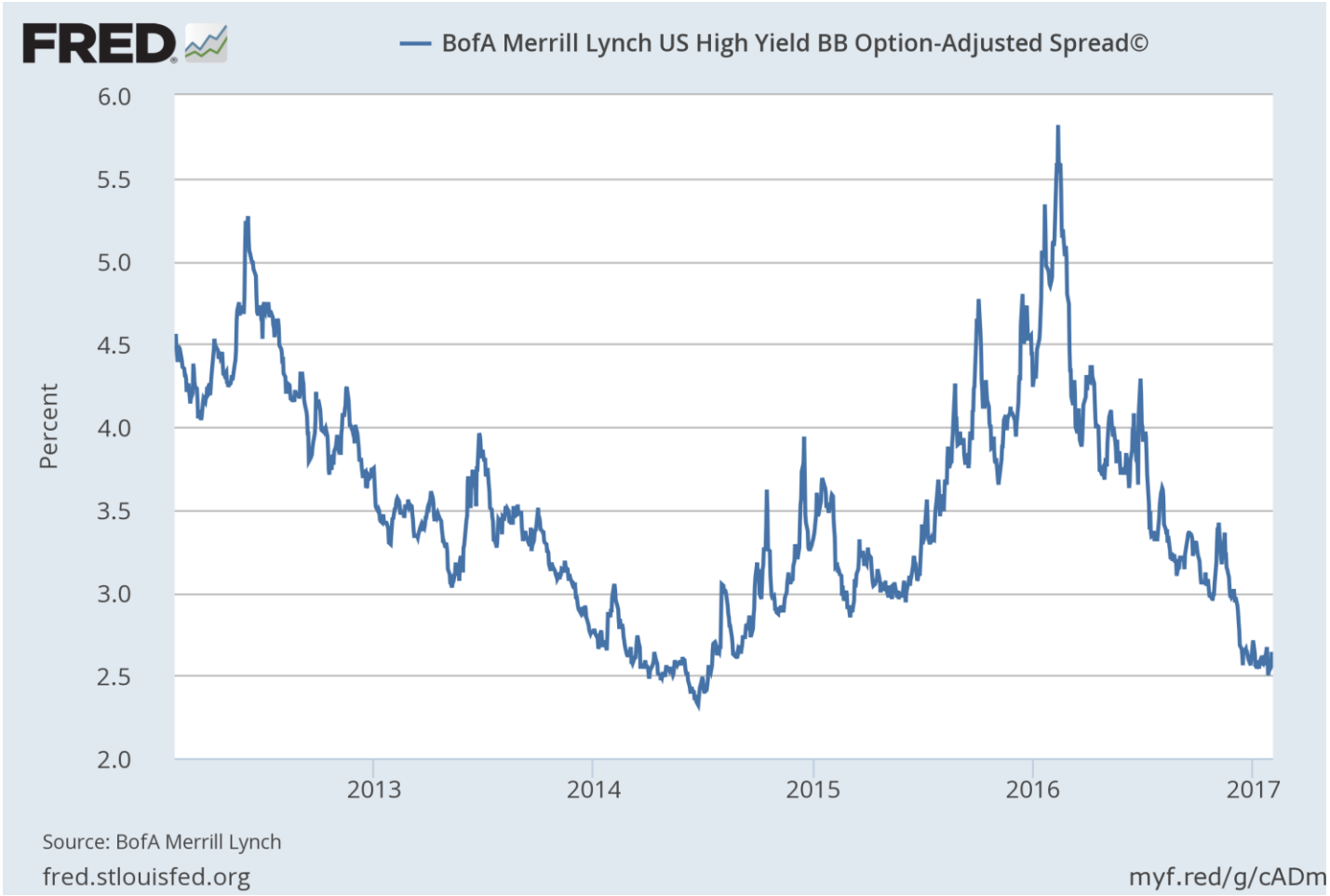
US Average : 2.03%

Feb 2017: 1.61%

BofA Merrill Lynch, BofA Merrill Lynch US Corporate BBB Option-Adjusted Spread© [BAMLC0A4CBBB], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/BAMLC0A4CBBB, February 4, 2017.

US Corporate Spreads

Corporate BB



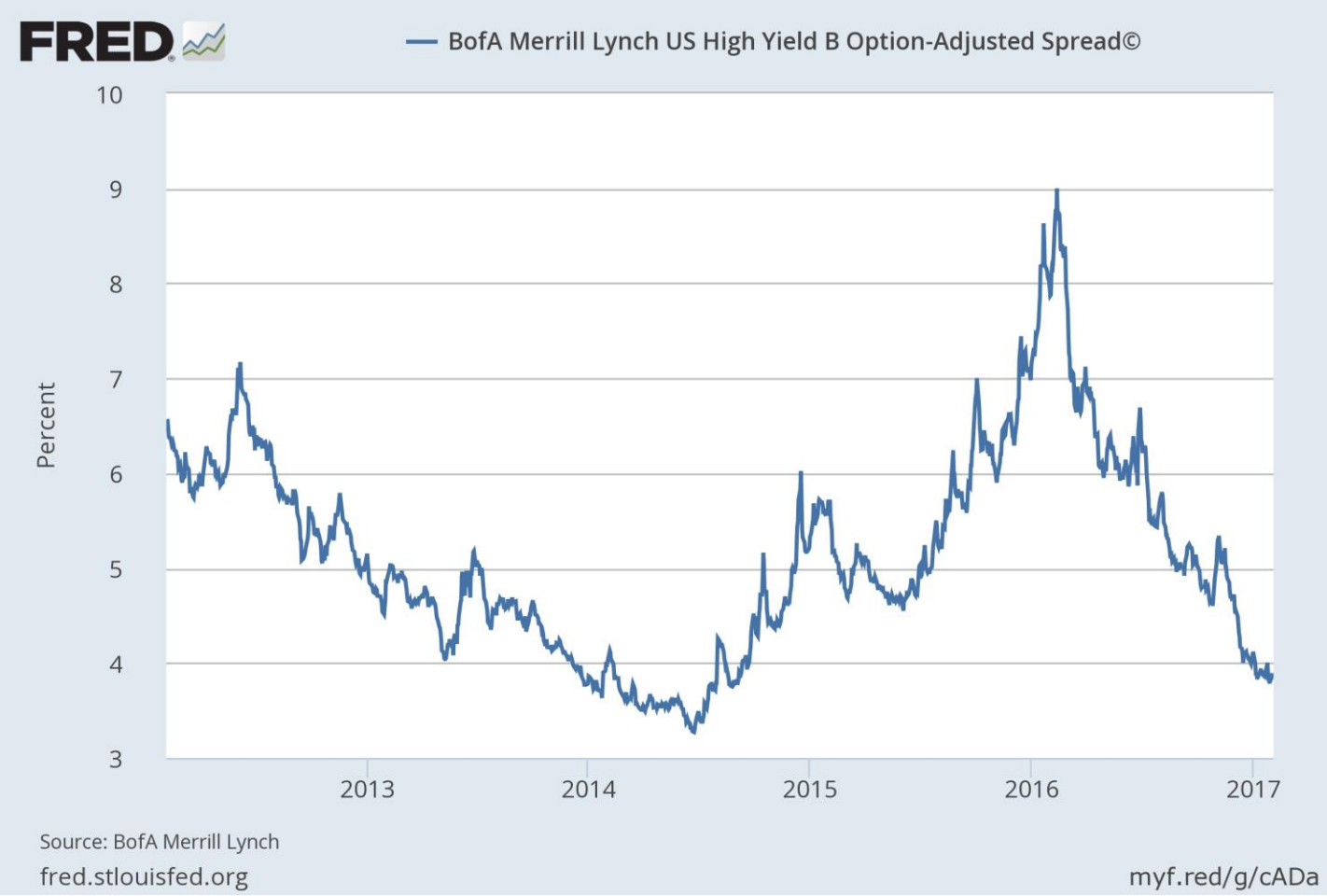
US Average : 3.51%

Feb 2017: 2.57%

BofA Merrill Lynch, BofA Merrill Lynch US Corporate BB Option-Adjusted Spread© [BAMLC0A4CBBB], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/BAMLC0A4CBBB, February 4, 2017.

US Corporate Spreads

Corporate B



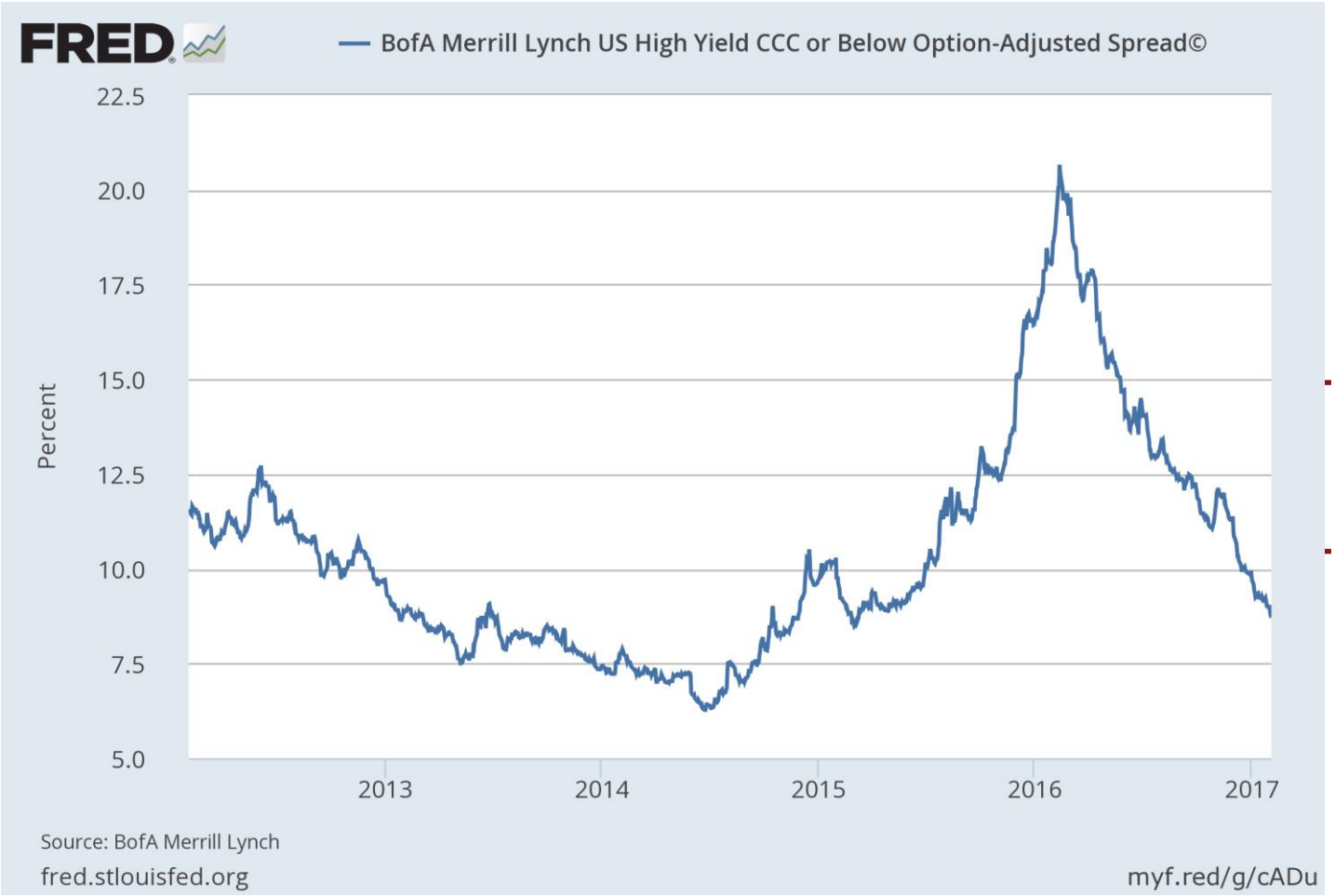
US Average : 5.14%

Feb 2017: 3.84%

BofA Merrill Lynch, BofA Merrill Lynch US Corporate B Option-Adjusted Spread© [BAMLC0A4CBBB], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/BAMLC0A4CBBB, February 4, 2017.

US Corporate Spreads

Corporate CCC



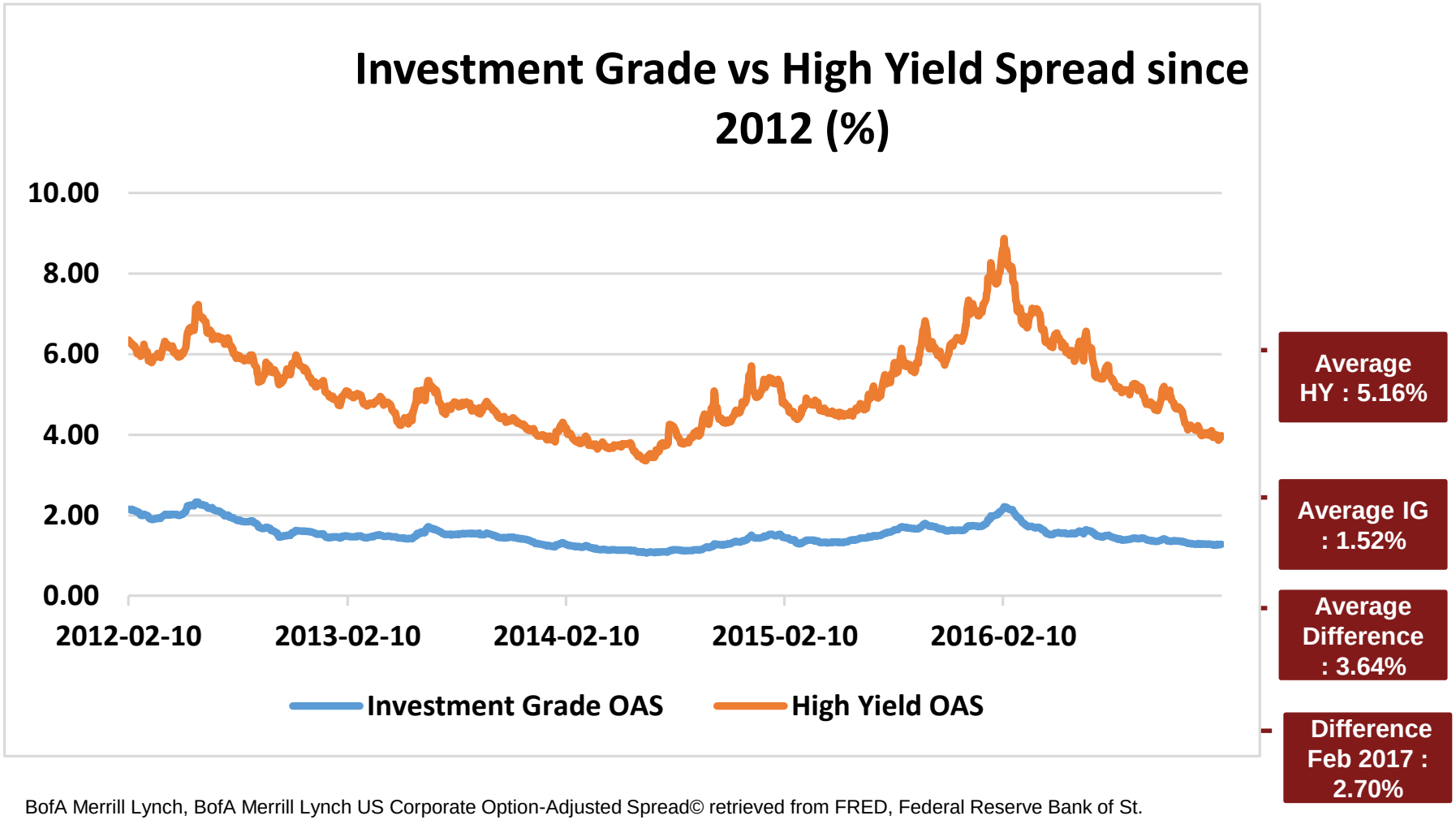
US Average : 10.39%

Feb 2017: 8.71%

BofA Merrill Lynch, BofA Merrill Lynch US Corporate CCC Option-Adjusted Spread© [BAMLC0A4CBBB], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/BAMLC0A4CBBB, February 4, 2017.

US Corporate Spreads

Corporate HY vs IG OAS



BofA Merrill Lynch, BofA Merrill Lynch US Corporate Option-Adjusted Spread© retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/BAMLC0A4CBBB, February 11, 2017.

US Yields and Spreads

Conclusions by rating

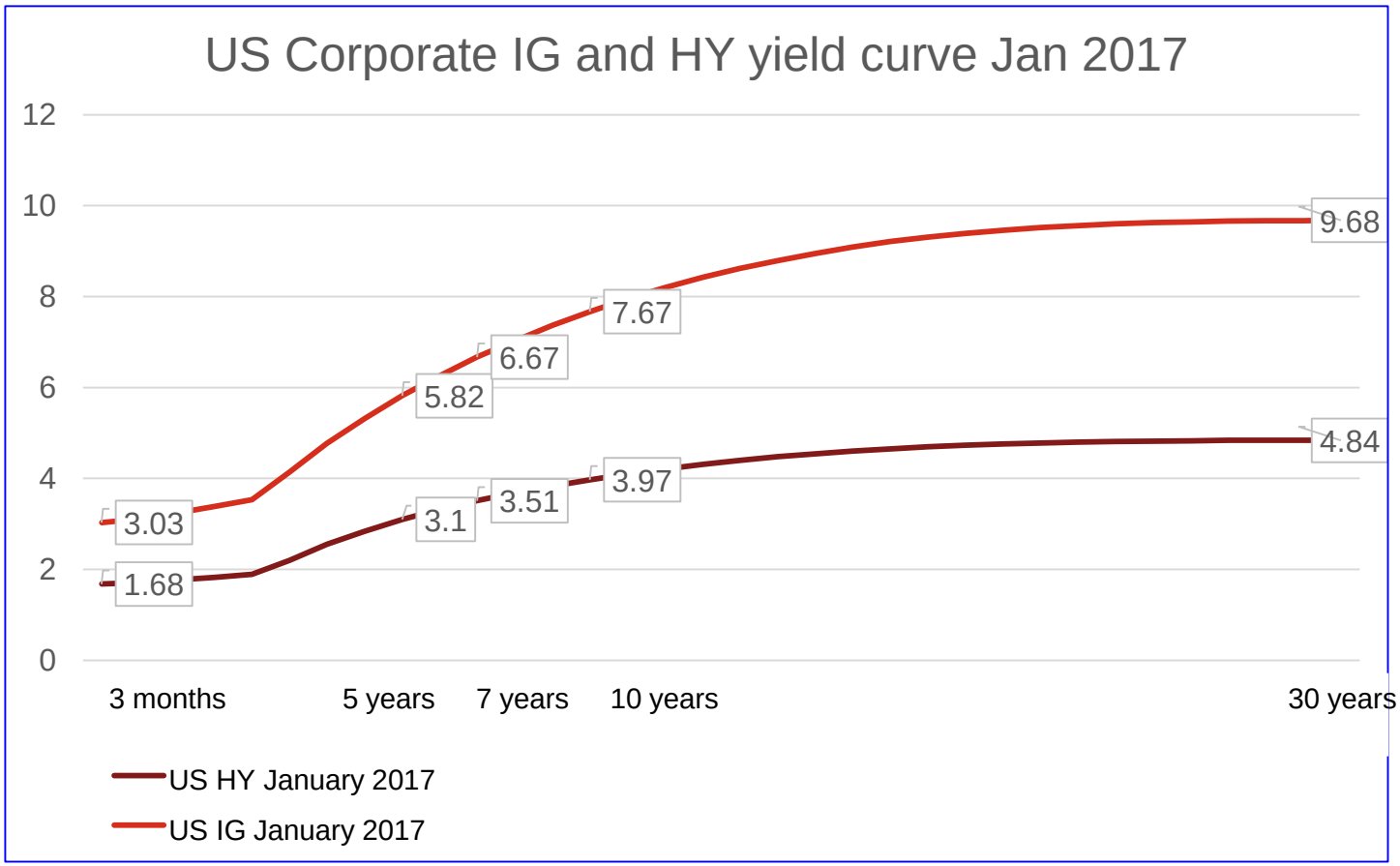
US Treasury	
	Long Term Average Yield
10 year	2.0%
20 year	2.7%
30 year	3.0%

US Corporate		
Credit Quality	Long Term Average OAS	Estimated Yield
BBB	2.00%	5.0%
BB	3.50%	6.5%
B	5.0%	8.0%
CCC	10.40%	13.4%
HY average	6.30%	9.30%

US Average long term spreads and yields by Rating			
Credit Quality	OAS Spread	Cumulative Spread	Yield
US 30 Year T Bill			3.0%
AAA	0.69%	0.7%	3.7%
BBB	+1.34%	2.0%	5.0%
BB	+1.48%	3.5%	6.5%
B	+1.63%	5.1%	8.1%
CCC	+5.25%	10.4%	13.4%

US Yields and Spreads

Conclusions by maturity



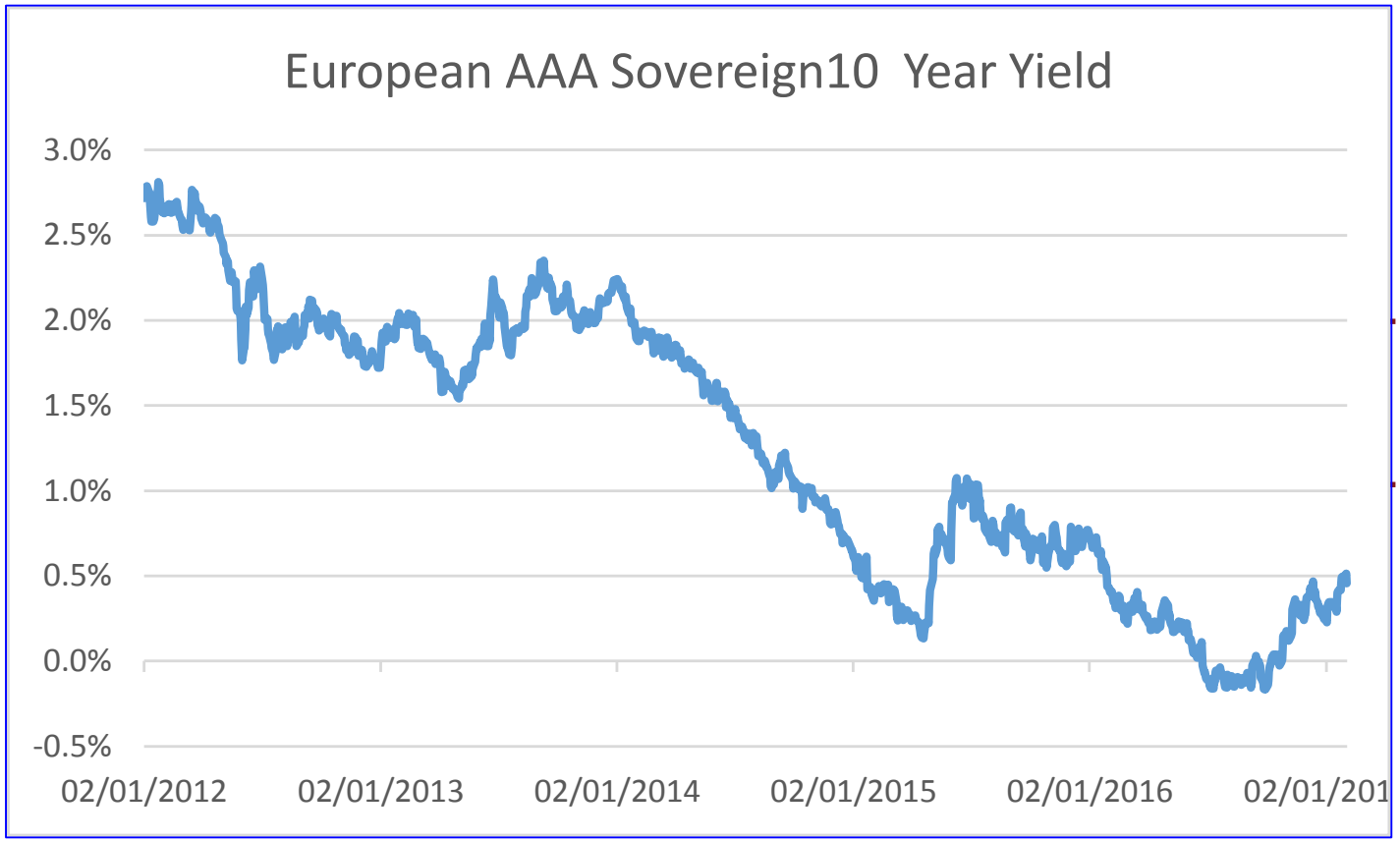
Source : FIB

Estimating the Discount Rate

European Yields and Spread Benchmarks

European Sovereign Yields

ECB 10 year



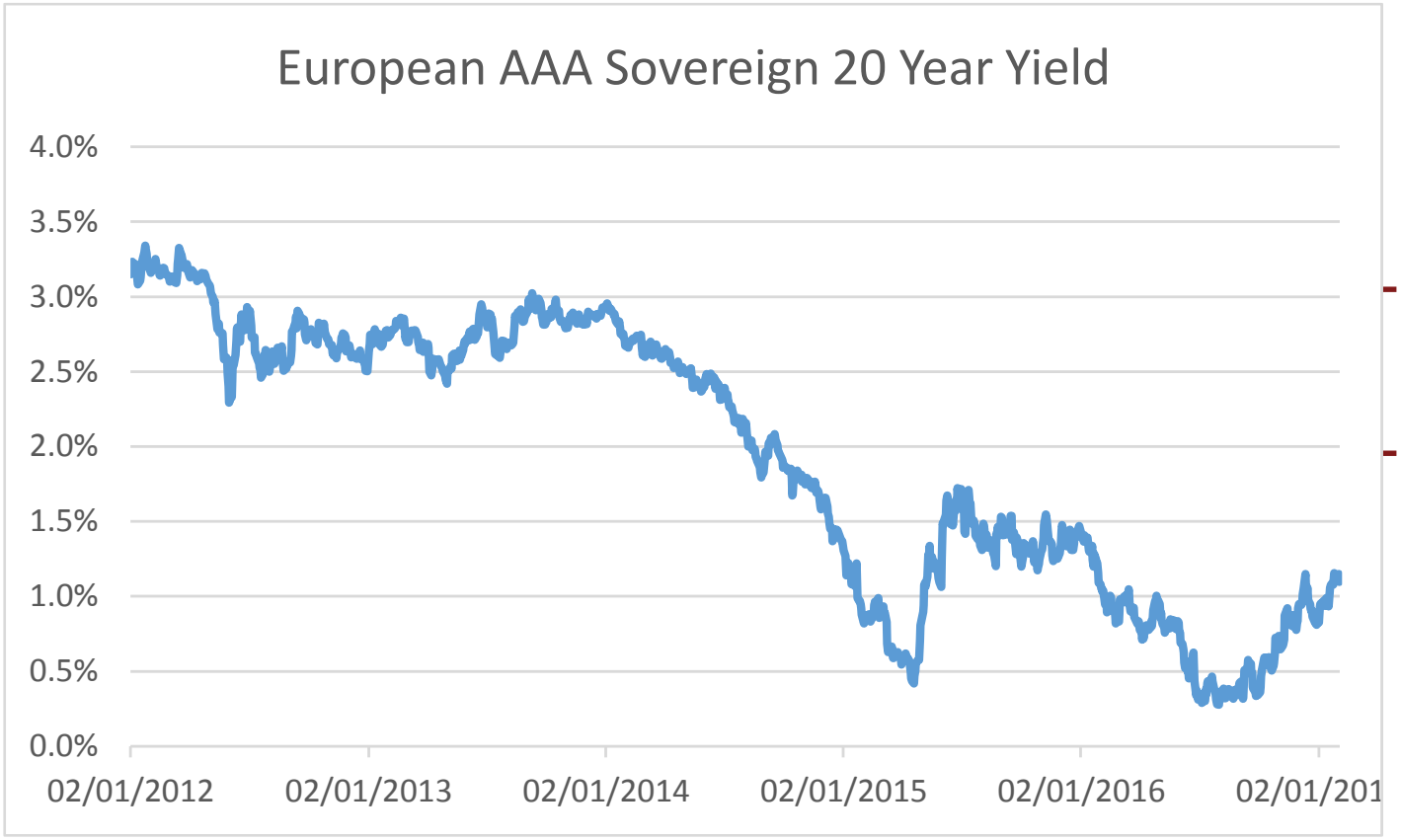
Average : 1.25%

Jan 2017 : 0.46%

www.ecb.europa.eu/stats

European Sovereign Yields

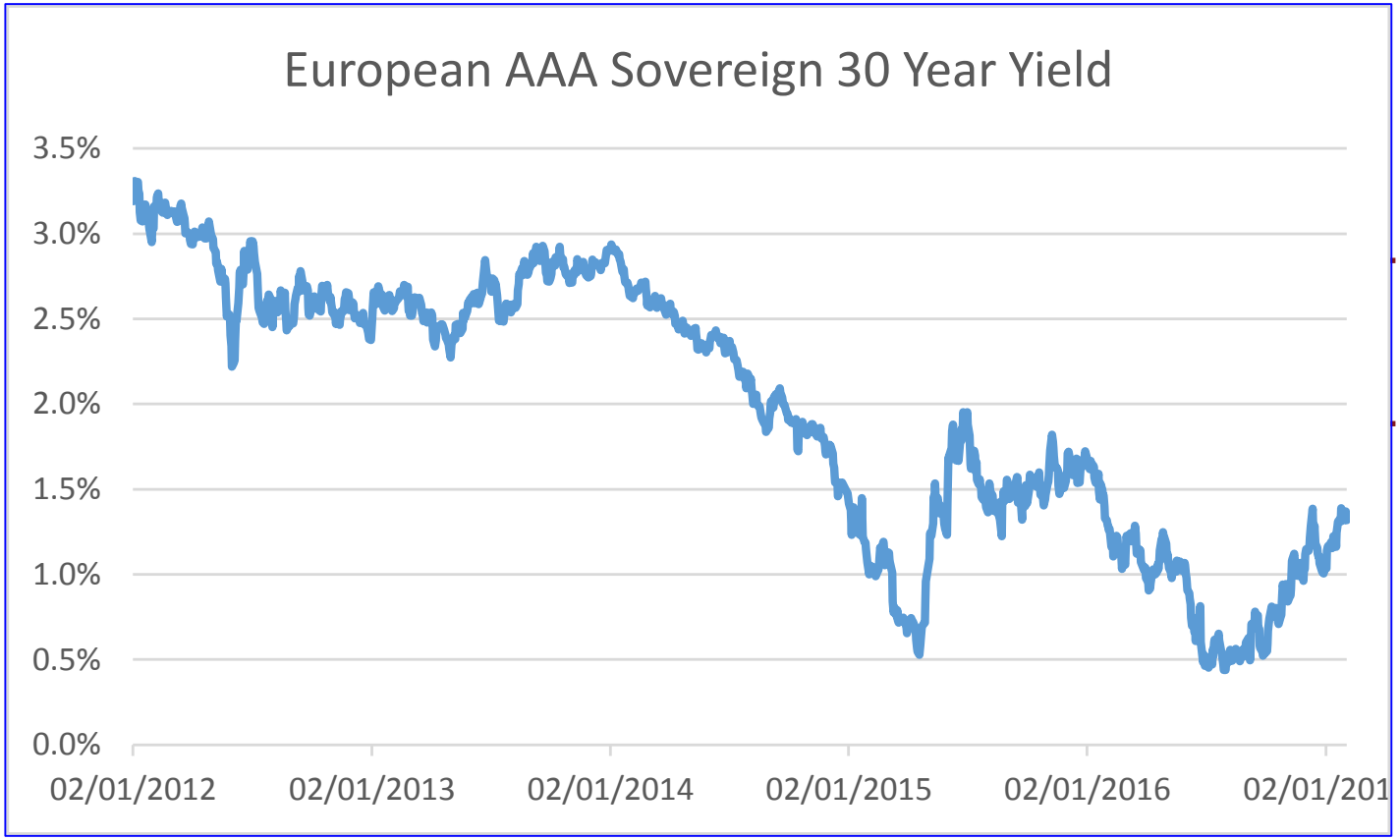
ECB 20 year



www.ecb.europa.eu/stats

European Sovereign Yields

ECB 30 year



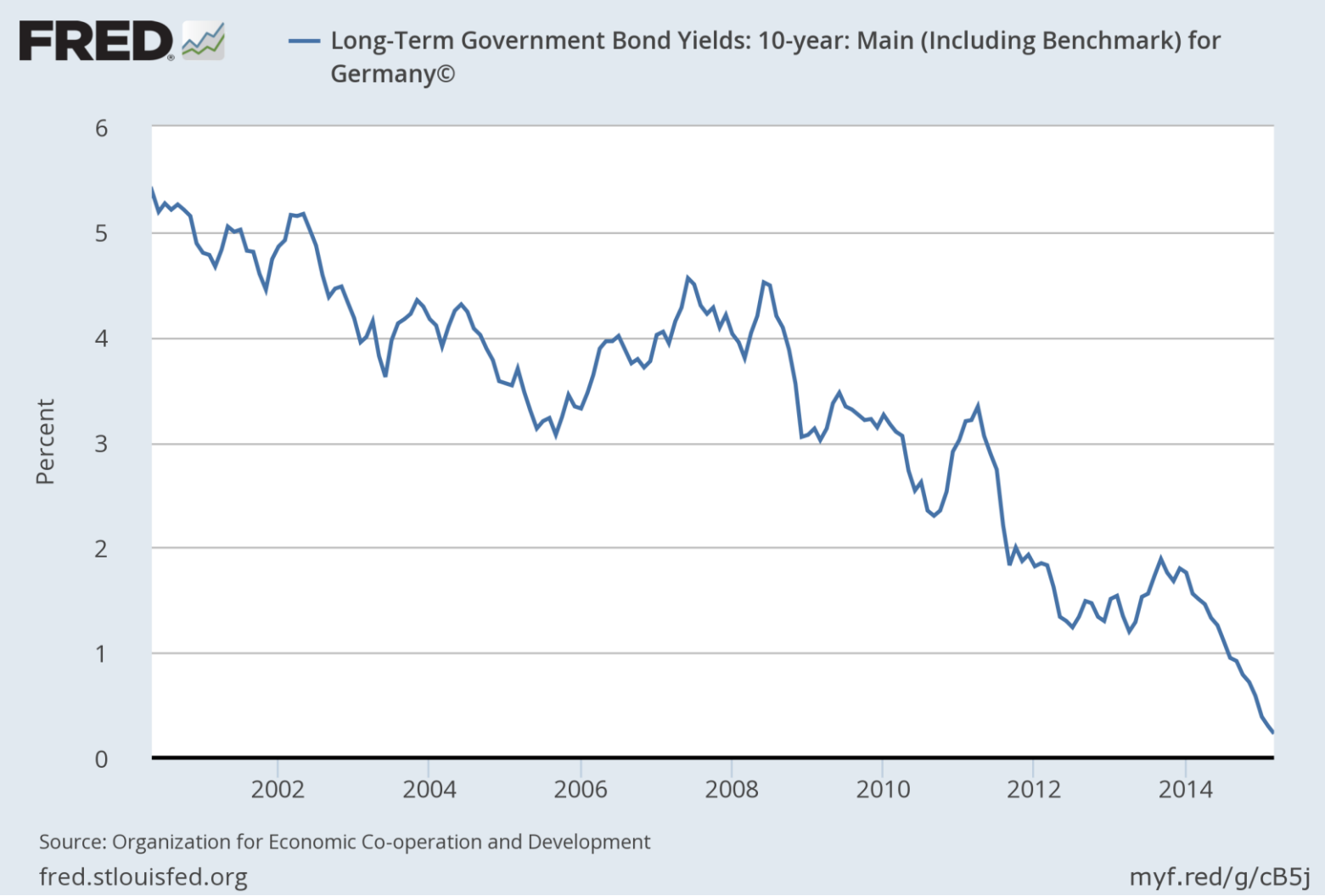
Average : 1.98%

Jan 2017 : 1.32%

www.ecb.europa.eu/stats

European Sovereign Yields

Germany 10 year since 2000



Average : 3.30%

Jan 2017 : 0.23%

Organization for Economic Co-operation and Development, Long-Term Government Bond Yields: 10-year: Main (Including Benchmark) for Germany© [IRLTLT01DEM156N],
Retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/IRLTLT01DEM156N, February 3, 2017.

European Corporate Yields

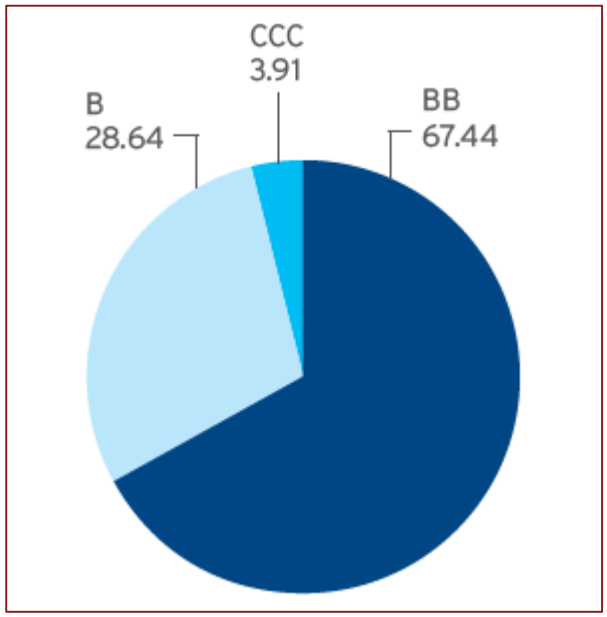
INDEX PROFILE

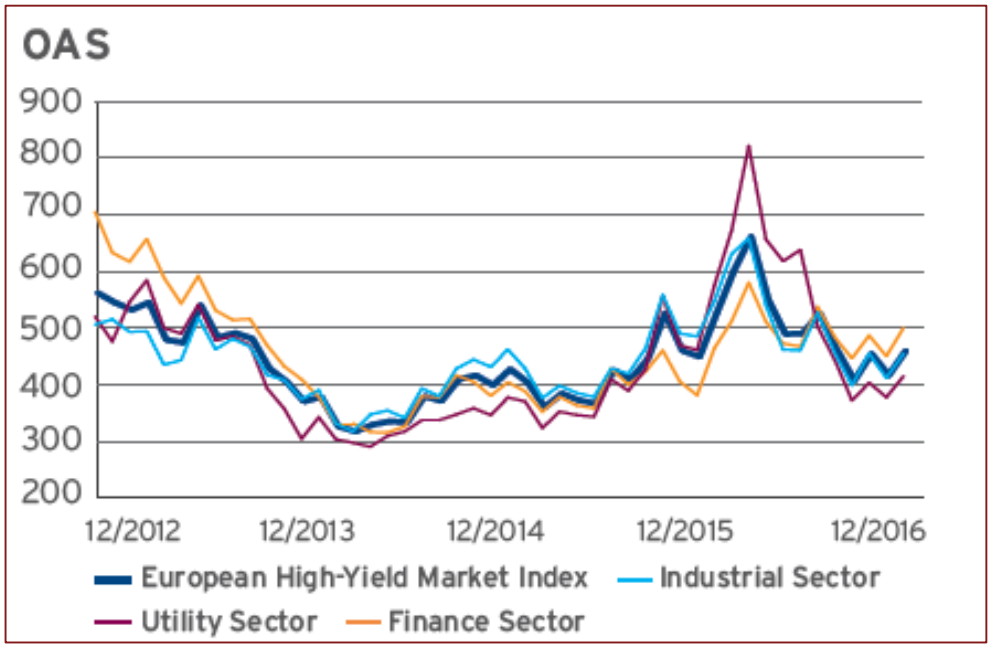
Description	# of issues	Par Amount*	Market Value*	Market Weight (%)	Average Coupon (%)	Average Life (Years)	Yield to Maturity (%)	Effective Duration	OAS (bps)
European High-Yield Market Index	**680**	**359.22**	**372.42**	**100.00**	**5.26**	**5.75**	**4.11**	**3.54**	**405**
EUR	541	301.55	310.50	83.37	4.91	5.77	3.85	3.48	395
GBP	122	53.21	57.40	15.41	7.32	5.69	5.62	3.86	462
CHF	17	4.46	4.51	1.21	3.70	4.97	2.94	3.37	372
Cash Pay	639	340.60	358.88	96.37	5.32	5.27	4.10	3.49	405
Deferred Interest	41	18.62	13.53	3.63	4.05	14.57	4.33	4.77	404
1-3 years	169	95.73	102.05	27.40	5.75	2.08	3.30	1.78	374
3-5 years	216	105.11	110.04	29.55	5.50	3.99	4.48	2.68	434
5-7 years	165	87.71	93.13	25.01	5.18	5.91	4.29	3.73	402
7-10 years	81	48.68	50.48	13.56	4.36	8.11	4.09	6.57	390
10+ years	49	21.99	16.70	4.48	4.22	24.28	5.66	9.66	464
Industrial	419	204.37	213.52	57.33	5.10	5.26	4.14	3.58	401
Utility	84	58.26	62.26	16.72	5.18	5.02	3.66	3.50	363
Finance	177	96.59	96.63	25.95	5.64	7.24	4.34	3.47	440

*In EUR billions

Citi European High Yield Market Index, 31 December 2016

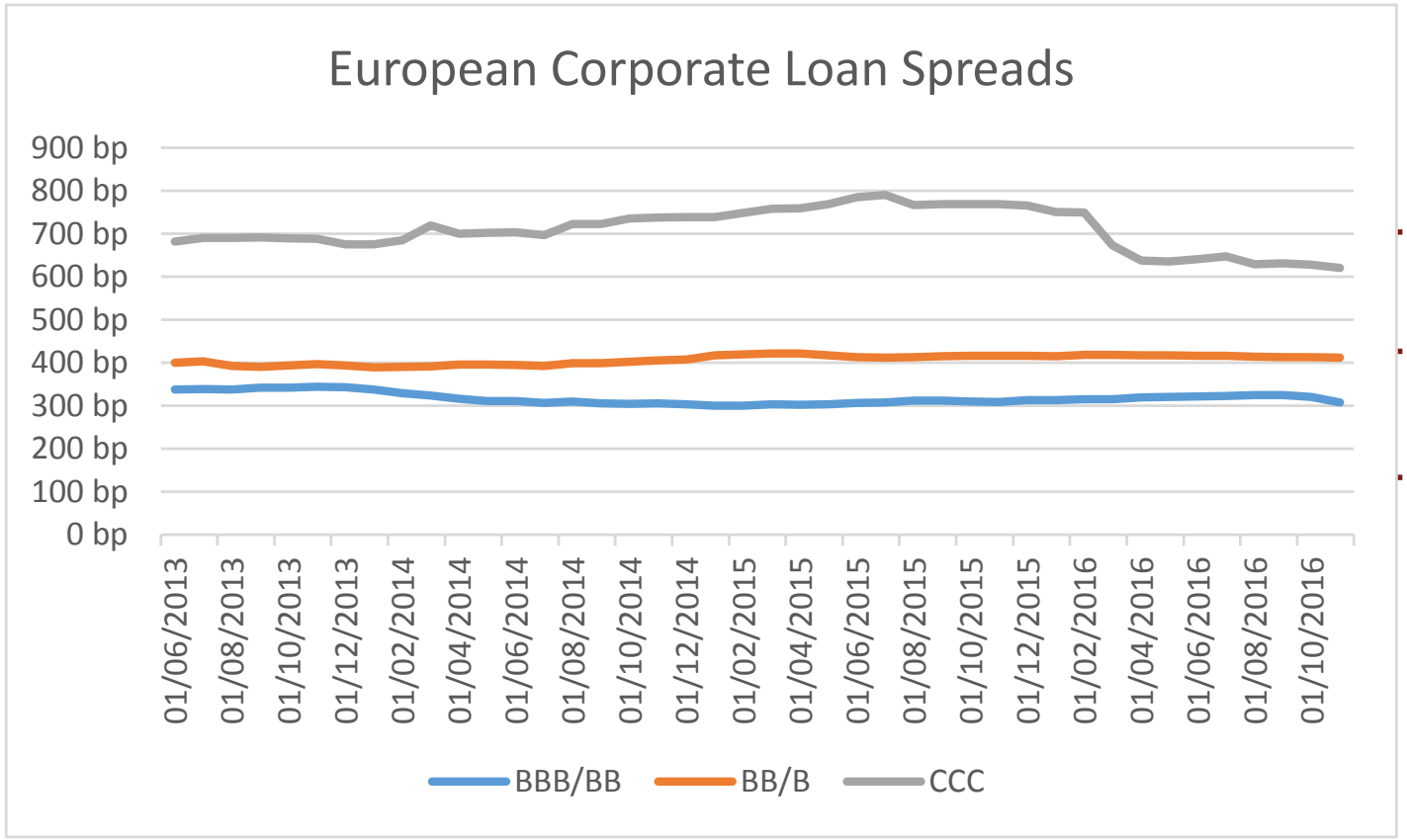
European Corporate Yields





Citi European High Yield Market Index, 31 December 2016

European Corporate Spreads



European HY Average : 4.8%

European BBB/BB Average : 3.2%

European BB / B Average : 4.1%

European CCC Average : 7.2%

Source : FIB

European Yields and Spreads

Conclusions

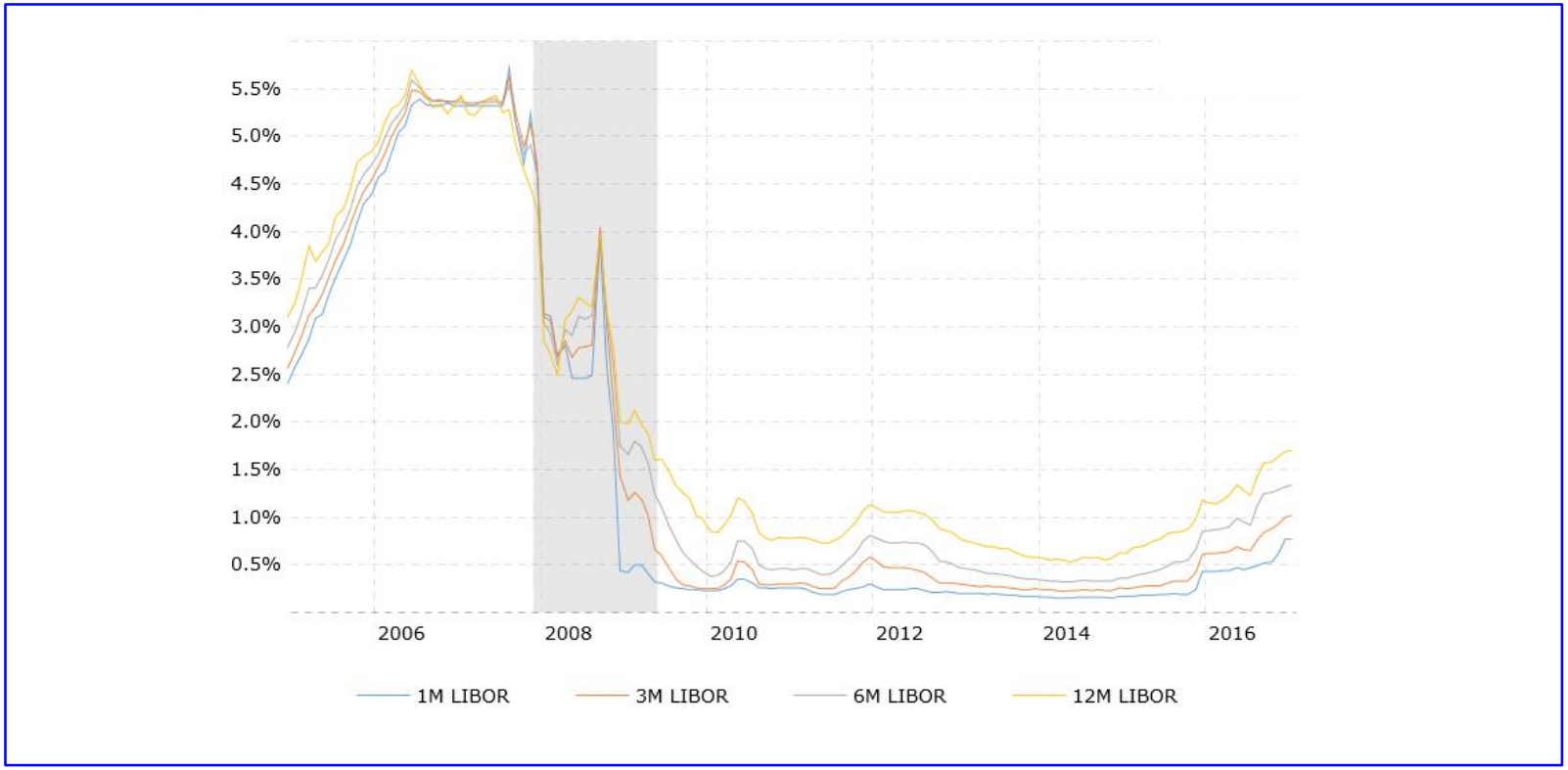
EU Sovereign	
	Long Term Average Yield
ECB 10 year	1.3%
ECB 20 year	2.0%
ECB 30 year	2.0%
Germany 10 Year	3.3%

EU Corporate			
Credit Quality	Long Term Average Spread	Estimated Yield	US Yield
BBB	2.00%	5.3%	5.0%
BB	3.20%	6.5%	6.5%
B	4.07%	7.4%	8.0%
CCC	7.20%	10.5%	13.4%
HY Average	4.82%	8.12%	9.30%

Yields and Spreads

£ Libor

£ Libor since 2005



Source : FIB

Yields and Spreads

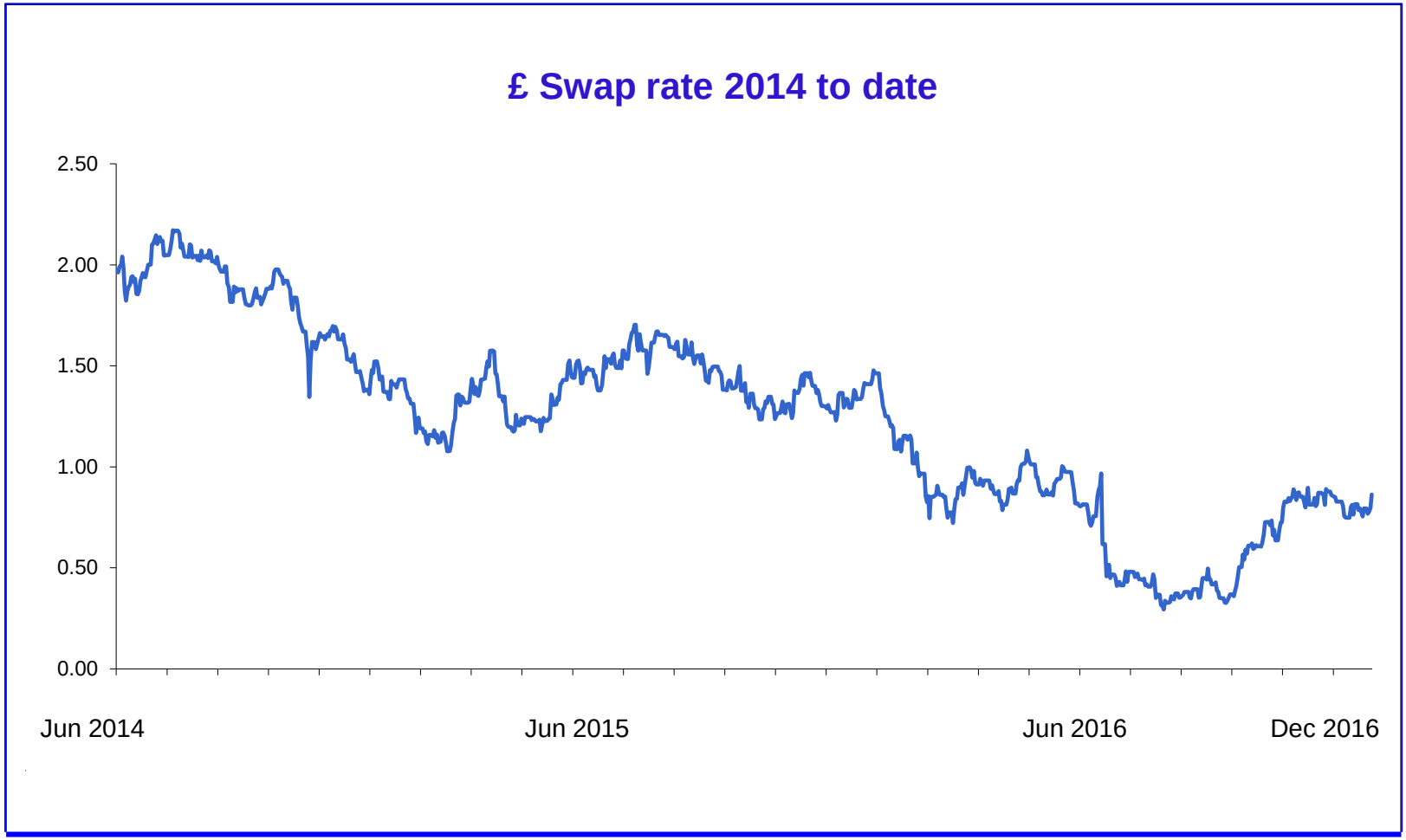
US $ Libor

US$ Libor since 2005

Source : FIB

Yields and Spreads

5 Year £ Swaps



Average : 1.23%

Source : FIB

5. Examples

A Snapshot from the Experts

From 2015 10k of large quoted private equity company **KKR**

- *Credit Investments:* Credit investments are valued using values obtained from dealers or market makers, where these values are not available, credit investments are valued by us based on ranges of values determined by an independent valuation firm. Valuation models are based on discounted cash flow analyses, for which the key inputs are determined based on **market comparables, which incorporate similar instruments from similar issuers.**

- Valuation Process : Level II and Level III investments were valued using internal models with significant unobservable inputs

- Credit Investments Fair Value: **$5 billion**

Method	Unobservable Input	Weighted Average	Range	Impact from an Increase of Input
Yield Analysis	Yield	9.40%	5.5% - 30.3%	Decrease
Net Leverage		4.6x	0.5 - 18.3x	Decrease
EBITDA Multiple		6.4x	0.4x - 25.4x	Increase

Loan Value

Example 1 : A Stable B Loan

$ millions	Year 1	Year 2	Year 3	Year 4	Latest
Revenue	170	230	350	400	570
EBITDA	20	30	40	50	65
Capex	3	4	11	14	36
Interest Expense	5	7	9	10	11
Free cash before tax and WC	13	18	20	25	18
Capital Structure					
Cash					7
Revolving loan facility					50
First Lien term loan					200
Senior Debt					**250**
Second lien term loan					0
Total debt					**250**
Market Capitalisation					225
Total capitalisation					475
Leverage					
Senior Leverage					3.9x
Total Leverage					3.9x
Total net Leverage					3.8x
Total Enterprise Value					7.3x

- US$200m, 5 years
- First lien
- L +450, 1% floor
- LBO funding
- Key financial stats set out opposite

Loan Value

Example 1

- Comparable Valuation Benchmarks
- Enterprise value and Leverage from quoted companies and from completed M&A Deals

$ millions Comparable Transaction	Date	EBITDA	EV	EV/EBITDA
Transaction 1	May-15	250	1900	7.6x
Transaction 2	Mar-15	70	400	5.7x
Transaction 3	Jan-15	55	575	10.5x
Transaction 4	Aug-14	70	625	8.9x
Transaction 5	Nov-13	70	560	8.0x

Comparable Quoted Companies	EBITDA	Debt	EV	EV/EBITDA	Leverage
Comp 1	1100	130	6500	5.9x	0.1x
Comp 2	180	200	1100	6.1x	1.1x
Comp 3	190	0	1920	10.1x	0.0x
Comp 4	120	0	750	6.3x	0.0x
Comp 5	20	14	950	47.5x	0.7x
Comp 6	230	100	1700	7.4x	0.4x
Comp 7	460	80	4200	9.1x	0.2x
Comp 8	270	870	2500	9.3x	3.2x
Comp 9	240	110	1300	5.4x	0.5x
Example 1	65	260	475	7.3x	4.0x

Loan Value

Example 1 :

- Concluded 5.9% yield considered:
  - Yields on the debt of comparable maturity and terms
  - Comparable security
  - Comparable leverage
  - Recent announcements of borrower;
  - financial maintenance covenant of borrower;
  - Illiquidity of the subject loan; and
  - Recent valuation dates.

Public Loan Comps	Coupon	Maturity	Price	Yield	Amount	Net Leverage
A 1st Lien	L + 450, 1.00% floor	Mar-20	97.9	6.30%	400	2.4x
B 1st Lien	L + 450, 0.75% fl	Aug-22	95.8	6.00%	1800	2.4x
C 1st Lien	L + 325, 1.00% fl	Mar-22	99.9	4.20%	4500	3.8x
D 1st Lien	L + 525, 1.00% fl	Oct-21	98.0	5.70%	1400	4.2x
E 1st Lien	L + 400, 1.00% fl	Oct-21	98.0	5.40%	500	4.8x
F 1st Lien	L + 400, 1.00% fl	Oct-22	99.5	5.00%	200	4.3x
G 1st Lien	L + 325, 1.00% fl	Apr-19	88.5	9.00%	300	4.4x
Average				**5.94%**	**1300**	**3.8x**
Example 1	**L + 450, 1.00% fl**	**Jun-21**	**97.75**	**5.87%**	**250**	**4.0x**

Loan Value

Example 2 : BB Loan under pressure?

- Senior loan €75m
  - 6 year bullet
  - Call provisions (NC1 / 102 / 101)
  - Other ‘Cov lite’ terms

- PIK note €25m
  - 6.5 year bullet

- Fund an LBO
- Company acquired at 5x EBITDA
  - Peers trading at c 9 – 10x EBITDA

Loan Value

Example 2

Projections

€ millions	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7
Revenue	110	100	85	75	80	85	90	90
EBITDA	60	60	45	35	40	40	40	41
Capex	25	25	25	26	23	24	24	24
Operating Free Cash	26	24	17	7	13	16	16	16
Cash interest expense				6	6	6	5	5
Cash Flow for Debt Service				1	7	10	11	11
Capital Structure								
Cash			5	6	10	15	25	30
Revolving loan facility			0	0	0	0	0	0
Senior term Loan			75	75	72	68	64	60
Total Senior Debt			**75**	**75**	**72**	**68**	**64**	**60**
Net senior debt			70	69	62	53	39	30
PIK Note			25	30	35	43	50	60
Total Debt			**100**	**105**	**107**	**111**	**114**	**120**
Total net debt			95	99	97	96	89	90

Loan Value

Example 2

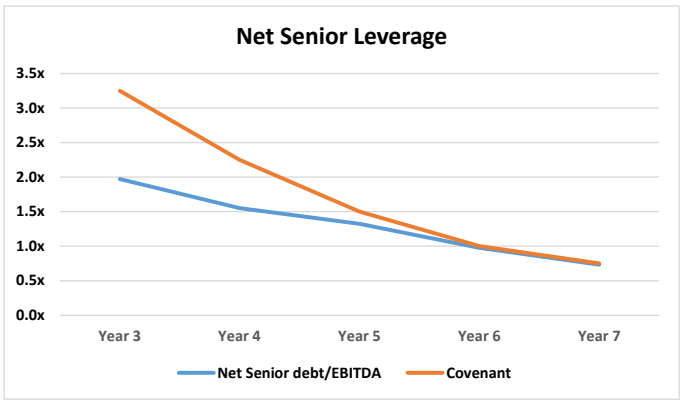
Issuer	Type	Currency	Coupon /Margin	Rating	Maturity	YTM	Leverage
A Snr Unsec	fixed	Eur	7.25%	B / B3	May-22	7.00%	5.7x
A Snr Unsec	fixed	Eur	7.25%	B / B3	May-22	7.00%	5.7x
B 1st Lien Snr Sec	floating	US$	L + 3.75%, 0.75% fl	B+ / B1	May-20	5.00%	3.9x
B 1st Lien Snr Sec	floating	Eur	L + 3.75%, 0.75% fl	/ B1	May-20	5.00%	3.9x
B 1st Lien	fixed	US$	6.00%	B+ / B1	May-22	6.00%	3.9x
B 1st Lien	fixed	Eur	5.38%	B+ / B1	May-22	4.50%	3.9x
C 1st Lien	fixed	Eur	6.25%	B+ / B1	Aug-22	5.00%	3.8x
D 1st Lien	fixed	US$	5.50%	BB- / Ba3	Jan-23	4.50%	3.9x
E Snr Unsec	fixed	US$	4.88%	B / B2	Feb-22	7.50%	4.8x
F Snr Unsec	fixed	Eur	7.13%	B / B2	May-24	5.00%	5.4x
G 1st Lien Snr Sec	floating	Eur	E + 3.00%, 0.75% fl	BB- / Ba3	Jan-22	4.00%	4.1x
Average						**5.50%**	4.5x
Example 2			**L + 7.00%, 1.00% fl**		**Jul-22**		**2.8x**

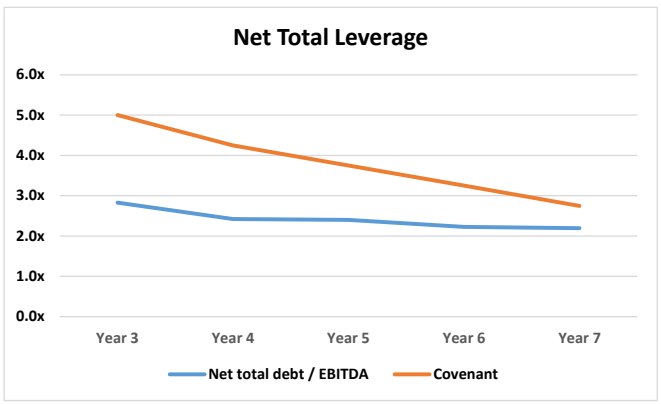
- Senior priced at L + 7% with a 1% floor. Estimated leverage of 2.8x
- PIK priced 15%+

Loan Value

Example 2

Leverage and coverage	Year 3	Year 4	Year 5	Year 6	Year 7	Year 7
Net Senior debt/EBITDA	1.6x	2.0x	1.6x	1.3x	1.0x	0.7x
Net total debt / EBITDA	2.1x	2.8x	2.4x	2.4x	2.2x	2.2x
EBITDA / Cash interest	7.7x	5.8x	6.7x	6.7x	8.0x	8.2x



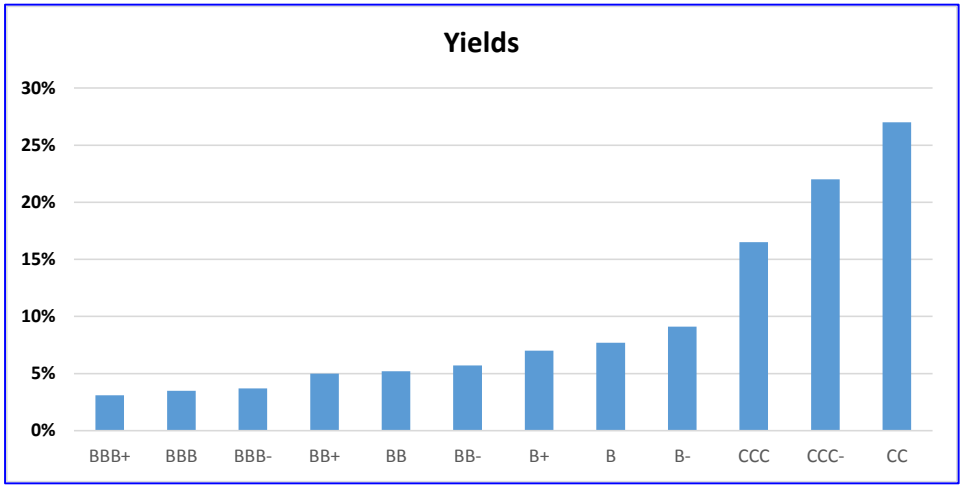


Loan Value

Example 2

- Valuer's Approach

Rating	BBB	BB	B	CCC
Debt /EBITDA	2.2x	3.2x	5.6x	9.6x
Example 2		3.4x		
Funds from Operations / Debt	0.3x	0.2x	0.1x	0.0x
Example 2		0.2x		
Interest cover	9.10x	5.20x	2.60x	1.10x
Example 2			2.7x	
Free Cash Flow / Debt	30.8%	18.0%	7.9%	0.7%
Example 2	20.0%			



- Valuer concluded a discount rate of 9.5% based on BB to B. Premium of c.2% because of the structure of the loan.
- Discount rate for the PIK at 20% (FITAJ basis)

Loan Value

Example 2

- Senior valued at 89% of par

Senior Loan		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
€m							
Balance		75	75	75	75	75	
Libor + 7%		8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Interest		6	6	6	6	6	0.3
Amortisation							
Principal repayment							75
Cash flow		6	6	6	6	6	75.3
Discount rate	9.50%						
PV of Cash flows	67						
% of par	89%						

- PIK at 91% of par

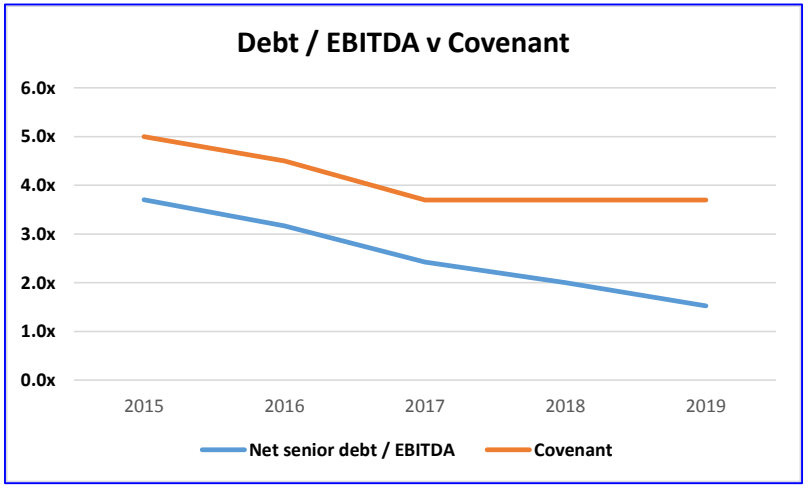
PIK Loan	Year 1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 6.5
€m								
Balance	25	29	35	42	50	60	69	
PIK interest		15%+	15%+	15%+	15%+	15%+	15%+	15%+
Interest		0	0	0	0	0	0	0
Amortisation		0	0	0	0	0	0	0
Principal repayment								74.5
Cash flow		0	0	0	0	0	0	74.5
Discount rate	20%							
PV of Cash flows	23							
% of par	91%							

Loan Value

Example 3 : PLC

- Senior secured US$100m+
  - 7 year bullet
  - Libor + 4.5% at leverage of 3x or greater, declining to L+4.0% at 3x or lower
  - LBO funding
  - Projected performance as of late year 1 of the loan

$ millions	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
At mid 2014						
Revenue	66	70	75	76	80	82
EBITDA	25	27	30	33	35	36
Capex	18	10	10	10	10	8
Working capital requir	10	1	1	1	1	1
Pre tax cash flow	-1	18	19	22	24	27
Net senior debt	100	100	95	80	70	55
Covenant		5.0x	4.5x	3.7x	3.7x	3.7x



Loan Value

PLC

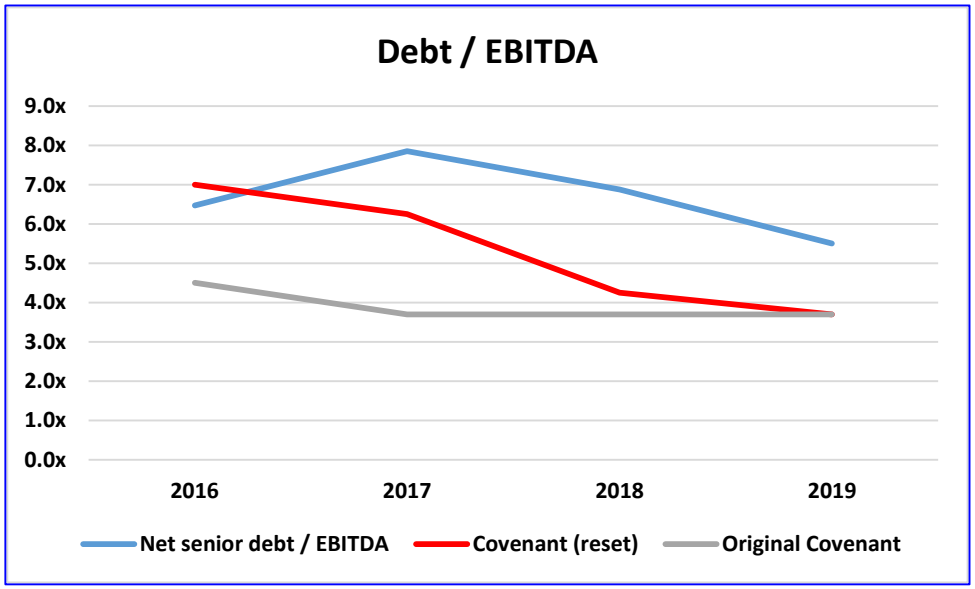
- PLC Year 1 loan pricing benchmarks

Company	Type	Coupon Type	Coupon	Maturity	S&P	Moody's	Price	Yield	Spread	Leverage
PLC	**1L Sr Sec**	**Floating**	**E + 4.5%**	**2021**	**n/a**	**n/a**	**99.00**	**5.10%**	**n/a**	**4.4x**
A	1L Sr Sec	Floating	E + 4.5%	2019	B	B2	100.50	4.6%	n/a	4.0x
B	Sr unsecured	Fixed	8.5%	2018	B	B2	103.25	7.3%	632	4.9x
C	Sr unsecured	Fixed	10.8%	2019		Caa1	100.75	10.5%	875	6.4x
D	Sr unsecured	Fixed	7.8%	2022	B+	B2	109.13	5.7%	469	1.7x
E	Sr unsecured	Fixed	7.0%	2019	B	B3	104.75	5.5%	372	6.5x
F	Sr unsecured	Fixed	3.3%	2021	A	A2	103.95	2.6%	7	3.9x
G	Sr unsecured	Fixed	7.0%	2022	B+	B3	109.00	4.9%	386	2.4x
H	Sr unsecured	Fixed	6.8%	2019	B	B2	104.34	5.4%	360	3.7x
I	Sr unsecured	Fixed	4.2%	2021	AA-		109.43	2.5%	-1	3.6x
J	Sr unsecured	Fixed	10.3%	2016	B-	B3	104.00	8.9%	713	9.2x
K	Sr unsecured	Fixed	7.4%	2016	BB-	B2	109.25	4.0%	343	3.3x
	Average		**7.3%**					**5.6%**	**415.6**	**4.5x**

Loan Value

PLC changing its name to CCC by year 3

$ millions	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Revenue	66	57	37	33	39	47
EBITDA	25	23	17	14	16	20
Net debt			150			
Net senior debt			110	110	110	110
Net senior debt / EBITDA			6.5x	7.9x	6.9x	5.5x
Covenant reset			**7.0x**	**6.3x**	**4.3x**	**3.7x**



- Concluded rating of B and a yield of 8.5% by end Q3 of year 3. (BB and 6.5% - 7.2% during year 2 and H1 year 3).
  - ➢ C90% of par in Q3 of year 3
- Sector multiples improved towards 10x in year 3, but not for PLC. Covenant waiver was granted.
- With total debt of c$155m, EV was estimated at 70% of debt.
- Rating moved to CCC and a yield of c13%
- 70 – 75% of par by end of year 3.

Loan Value

Example 4 : Default and Restructuring

- Borrower raised $150m from investors through a 5 year, 12% senior secured bond. Used to acquire and was secured on a ship active in the installation, maintenance and repair of offshore oil & gas platforms and pipelines.
- Borrower got caught up in a payment scandal and lost it key customer. The DPP of the country in which the ship operated got involved and embargoed the company from performing contracts with the ship.
- Unsurprisingly, an EoD was declared by the Trustee to the bondholders. Ship was arrested by the bondholders, moved to a friendly location, dry-docked, cleaned up, re-registered and put back out to work elsewhere.
- EoD penalties kicked in. Issuer could redeem at 108% of par + PV of remaining interest payments to maturity + an additional PIK rate of 5% (i.e., 17% in total). Penalties = max value of up to 2x the original bond.
- Restructuring by distressed debt investors:
  - Original senior unsecured bonds of c$40m at PIK 17% over 5 years. Provide the right to pursue the borrower;
  - New senior secured c$230m at PIK 12% over 6 years secured on the ship; and
  - Additional unsecured bonds of $30m at PIK 15% over 6 years - funding for vessel operations.
- Distressed investors agreed to underwrite the cost of a legal claim to recover the value of the original bond and penalties.

Loan Value

Example 4 :

- The value of the restructured bonds depends mainly on realising the value of the ship + the outcome of the litigation claim and the cost of the legal proceedings.

- The valuer used applied the DCF approach to a number of scenarios and assessed the probability of each outcome:

Scenario	Outcome	Date	Probability	Discount rate
Scenario 1	Case dismissed, vessel sold	Sep-17	40%	25%
Scenario 2	Case allowed, claim settled at 50%, vessel sold	Mar-18	15%	25%
Scenario 3	Case allowed, claim settled at 75%, vessel sold	Sep-18	30%	30%
Scenario 4	Case allowed, claim settled at 100%, vessel sold	May-19	15%	30%
Scenario 5	Case allowed, claim proceeds to trial, bondholders win and are awarded a multiple of damages, vessel sold	May-19	0%	n/a

- The recovery cash flows under each scenario were estimated:

  - The result of litigation claim *times* the claim settlement percentage; *less*
  - Legal costs and success fee (c 25%!); *plus*
  - The ship value (estimated by independent ship valuers) to give gross recovery proceeds; *multiplied by*
  - The probability;
  - All brought to present value at the discount rate; *and finally*
  - Multiplied by the % by which the investor agreed to underwrite the litigation costs.

- The present value of each scenario was summed to produce a weighted average total recovery value at c80%.

Loan Value

Example 5 : Recovery post Default

- A1st lien senior secured loan and a 2nd lien convertible loan that were in default.
- The loans were originally issued to fund the operations of a small mining company. Operations had ceased and were pending recommencement. The company owned many millions of tonnes of proven mineral resources (mostly ore but also including copper, lead, zinc among others).
- Senior loan secured on the mineral reserves.
- Loans acquired by a private equity firm, at 60% of par through a restructuring transaction.
- Valuation approaches test the recovery value of the collateral:
  - 1. DCF assuming a business plan is executed to develop the reserves over 15 years: key assumptions are commodity prices and the discount rate of 20%. Comparable company share prices trade at an adjusted multiple of NAV of 0.4x. This applied to the DCF value indicates c60% of par.
  - 2. Comparable transactions: over 50 transactions analysed to estimate a low $ per tonne of reserves. This indicated nearly 50% of par.
  - 3. Market value of PP&E: an engineering appraisal firm estimated a market value for the property plant and equipment of the mine on the secondary market. 43% of par.
- Method 2 was offers the most unbiased estimate of value as it uses distressed value per tonne at which the reserves can be sold quickly.

Loan Value

Example 6 : A Perpetual Loan

- A perpetual loan with a principal amount of c€200m equivalent issued in the mid 1990s in a number of individual tranches, all with identical terms.
- Fixed rate 6.8%. All interest on the loan between year 16 and 99 had been prepaid and there was zero interest remaining to be paid as of late 2015.
- Unsecured and subordinated to all other debt of the borrower, a leading international consumer goods group. The borrower agreed to a negative pledge regarding large department stores located throughout Europe.
- The company is a leading name with sales of €billions and very high margins of EBITDA. Leverage ratios well in excess of 25x.
- A credit quality assessment was performed:
  - By a leading investment bank, which provided an informal or shadow rating of A1 (in a two-line email!);
  - By a valuer using the online ratings program available from Moody's (RiskCalc)
  - And by the borrower itself by its in-house treasury team using a BoE approach (i.ie, along the lines presented earlier in this document but using the S&P framework)

Loan Value

Example 6 : A Perpetual Loan

- One cash flow: the par value of the bond payable in the early 2100s!
- The discount rate was constructed as follows:
  - An underlying long term (i.e. 60 year) swap rate of 1.88% based on data from a leading capital markets information provider. The swap curve is assumed to be flat beyond 30-years. Data from the ECB showed the 30 year yield at 1.82% indicating the extended maturity warranted an additional spread of 6bps.
  - A spread above the swap rate in view of the unsecured nature of the bonds:
    1. Review of 350 corporate unsecured credits of long maturity to analyze the spread above the comparable reference benchmark swap of each individual credit. Linear regression analysis was used to understand the relationship between spread and maturity. This indicated that the longest maturity bond (30 years) of the data set should have a spread of 1.26% above the swap rate.
    2. An additional 70 basis points was added to adjust for longer maturity to the early 2100s based on the analysis of long dated spreads of corporate issuers (eg Ford Motor company and Northfolk Southern).
  - Additional spread of 1.7% for the subordinated feature of the bonds. This is based on the spread for subordinated bonds (compared to their senior counterparts) observed among the universe of 350 corporates.
  - A liquidity spread of 15 – 30 basis points based on using a Black Scholes model, volatility from the index of bond exchange traded fund, a 3 – 5 year life, and ECB risk free rates.

Summary and Conclusions

- Private debt markets will continue to be attractive to investors because of their relative risk-adjusted returns. Potential refinancing needs are enormous over the next 3 – 5 years.
- There is a vast amount of data on issuers and loans.
- The most efficient way to look corporate debt market data is by credit rating and within credit rating, by maturity.
- The real purpose of this is to assess the risk of a loan falling down through the ratings.
- The basic valuation approach is DCF using an appropriate yield.
- To select the appropriate yield use “comparable instruments from comparable issuers”: comparable credit rating, comparable maturity, comparable size and comparable industry.
- Within that, side-by-side analysis of issuer yield, leverage and valuation multiples are the tools of the trade.
- Absent such detailed comparable data, market averages from public information sources can provide reliable cross-checks. But caution when applying broad index yields to specific loans.
- ‘Covenant lite’, covenant resets, covenant holidays and waivers, accompanied by such things as ‘equity cures’ and similar aggressive structures are more accepted and point to weaker credit quality.

Appendices

Appendix

Quality Spreads – the view from your friendly investment banker

US

- Average US$ BBB to BB: +150 to 175 bps
- US$ BB to B: +170 to 190bps
- US$ B to CCC : +550 to 650 bps

EU

- Euro € BBB to BB: +250 to 290 bps
- Euro € BB to B : + 220 to 250 bps
- Euro € B to CCC: + 770 to 825 bps !

Appendix

Comparison of Ratings

Moody's		S&P		Fitch		DBRS		rating description
Long-term	Short-term	Long-term	Short-term	Long-term	Short-term	Long-term	Short-term	
Aaa	P-1	AAA	A-1+	AAA	F1+	AAA	R-1H	Prime
Aa1		AA+		AA+		AA(high)		High grade
Aa2		AA		AA		AA	R-1M	
Aa3		AA-		AA-		AA(low)		
A1		A+	A-1	A+	F1	A(high)	R-1L	Upper medium grade
A2		A		A		A		
A3	P-2	A-	A-2	A-	F2	A(low)		
Baa1		BBB+		BBB+		BBB(high)	R-2H	Lower medium grade
Baa2	P-3	BBB	A-3	BBB	F3	BBB	R-2M	
Baa3		BBB-		BBB-		BBB(low)	R-2L, R-3	
Ba1	Not prime	BB+	B	BB+	B	BB(high)	R-4	Non-investment grade speculative
Ba2		BB		BB		BB		
Ba3		BB-		BB-		BB(low)		
B1		B+		B+		B(high)		Highly speculative
B2		B		B		B	R-5	
B3		B-		B-		B(low)		
Caa1		CCC+	C	CCC	C	CCC(high)		Substantial risks
Caa2		CCC				CCC		
Caa3		CCC-				CCC(low)		
Ca		CC				CC(high)		Extremely speculative
						CC		
						CC(low)		
		C				C(high)		
						C		
						C(low)		
C		D	/	DDD	/	D	D	In default
				DD				
				D				

Appendix

What Should a Loan Valuation Report Contain?

- The purpose of the valuation
- Description of the loan terms
- Background to the loan: purpose
- Analysis of the historic and projected financial performance and condition of the borrower
- Analysis of credit quality of the borrower
- Concluded credit rating of the borrower
- Valuation of the collateral for the loan
  - Enterprise and equity value of the company
  - Appraised value of real estate / property (eg commercial or real estate property, land)
  - Appraised value of property, plant and equipment / reserves (extractive industries)
  - Appraised value of IP (technology company)
- Basis for selected discount rate or yield on the loan
  - Similar market comparables
  - Yield curves
  - Swap rates
  - Libor/Euribor rates
- Presentation of the cash flows and calculation of their present value
- Value ranges
- Selection of the concluded valuation
- Cross checks to market and other norms
- Sensitivity analysis
- Appendix : supporting analysis and workings

Appendix

Basics: Duration and Convexity

- **Duration** and **convexity** describe the rate sensitivity of a bond or bond portfolio.

- **Duration :** the ratio of the percentage change in price to change in yield.

  - For an 8%, 20-year option-free bond, a 1% decrease in the YTM will increase the price to 110.67, a *10.67% increase* in price. A 1% increase in YTM will cause the bond value to decrease to 90.79, a *9.22% decrease* in value.

  - E.g. a 1% change in yield produces an approximate change in the price of this bond of 9.42%. You would therefore say duration is 9.42.

- **Convexity.** The price of an option-free bond increases more when yields fall than it decreases when yields rise.

  - For a given volatility of yields, price increases are larger than price decreases positive convexity.

  - When the price begins to *rise at a decreasing rate* in response to further decreases in yield, the price-yield exhibits negative convexity.

Appendix

Possible sources of Information, Insights and Guidance

- The websites of Moody's and S&P (especially S&P's Leverage Commentary & Data or LCD)
- Bloomberg and Thompson Reuters
- S&P Capital IQ
- The websites of valuation appraisal firms such as Duff & Phelps, Houlihan Lokey and accounting firms and bodies
- Website of the Chartered Financial Analyst Institute
- Website of Aswath Damodaran and NYU Stern
- Citi and Bank of America High Yield Market Indices
- Websites of investment banking firms, private equity firms and asset management companies
- Federal Reserve Bank (particularly the St Louis Fed)
- European Central Bank, OECD, BIS and IMF websites
- Investing.com, trading economics.com. Ft.com, wsj.com and economist.com
- Prequin.com, yieldbook.com, highyieldbond.com
- Markit iTraxx, Mergermarket
- JP Morgan Indices for emerging market bond yields and spreads (eg Central Bank of Argentina for LatAm)
- ciaran.cirrane@gmail.com