

CLOSER LOOK | DOMESTIC FIXED INCOME

DATA AS OF AUGUST 2016

Presented to: Pennsylvania Association of Public Employee Retirement Systems

Presented by: Ryan Labs Asset Management
(Daniel J. Lucey, CFA, Sean McShea, Pawel Krasowski)

Presented on: PAPERS Webcast, September 21, 2016 at 10:30 AM EST

THE SUN LIFE INVESTMENT MANAGEMENT GROUP OF COMPANIES



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CURRENT CAPITAL MARKET THEMES



ECONOMIC DATA POINTS & POTENTIAL IMPACT

\$4.5 Trillion New Treasury Issuance

Federal Funds Target Rate: 50 bps

30 Year US Home Mortgage Fixed Average: 3.65%

US 10 Year 1.54% versus Japanese 10 Year -0.08%

Negative Yields (Signal to lower lending standards)

Inflation: 1.8%

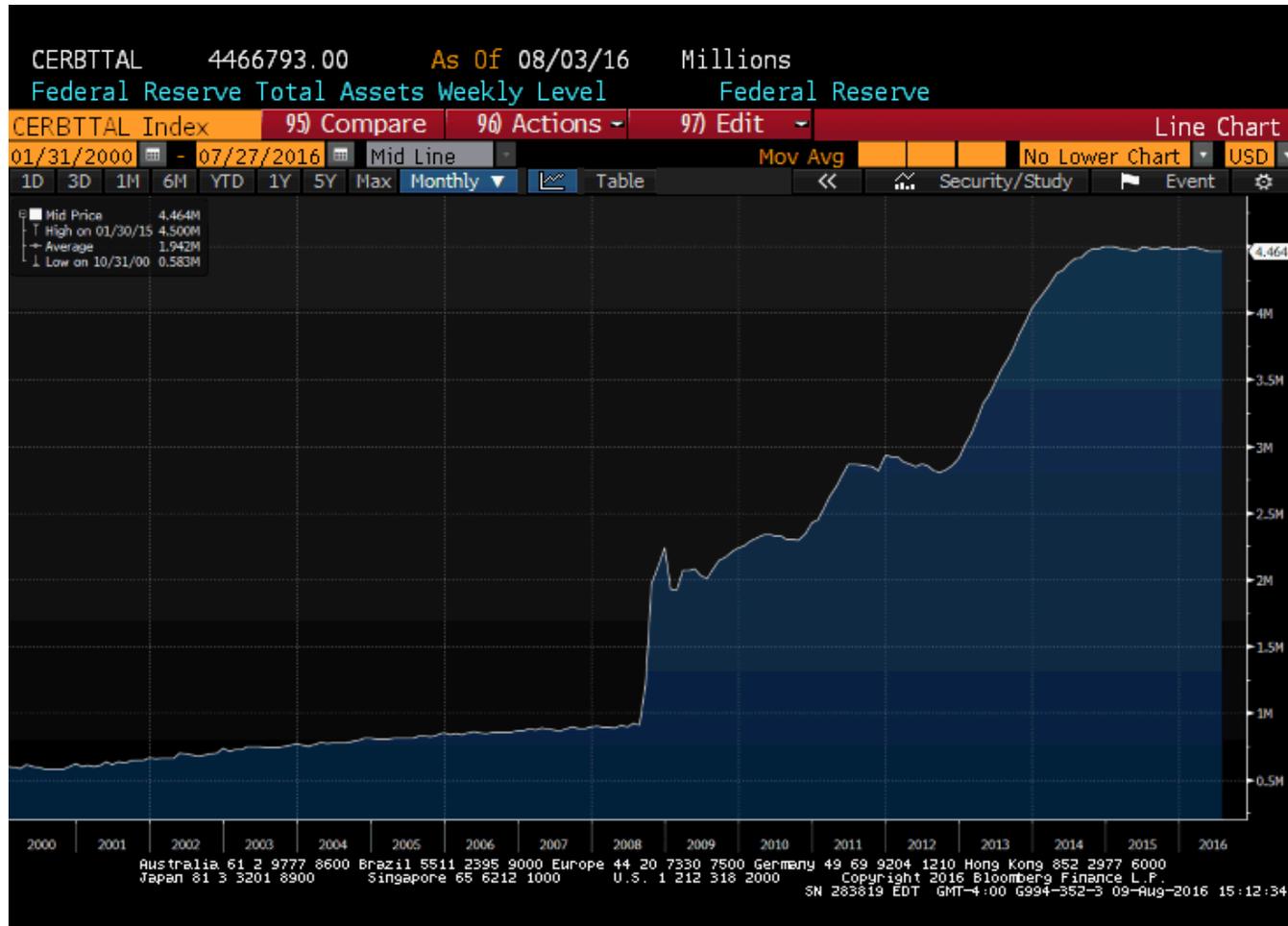
Demographics: In 2020, the 65 to 85 age group will be the largest growing

Crisis in Retirement Infrastructure

1. Low Corporate pension funding levels
2. Low Municipal pension funding levels
3. Low DC savings



FED ASSETS APPROACH \$4.5 TRILLION



Source: Bloomberg

Ryan Labs Asset Management

INTEREST RATES SIT AT LOWEST IN HISTORY



Source: Bloomberg

Ryan Labs Asset Management

MORTGAGE RATES NEAR LOWEST LEVELS IN HISTORY



Source: Bloomberg

Ryan Labs Asset Management

INFLATION SHOWING LITTLE SIGNS OF IMMEDIATE THREAT



Source: Bloomberg

Ryan Labs Asset Management

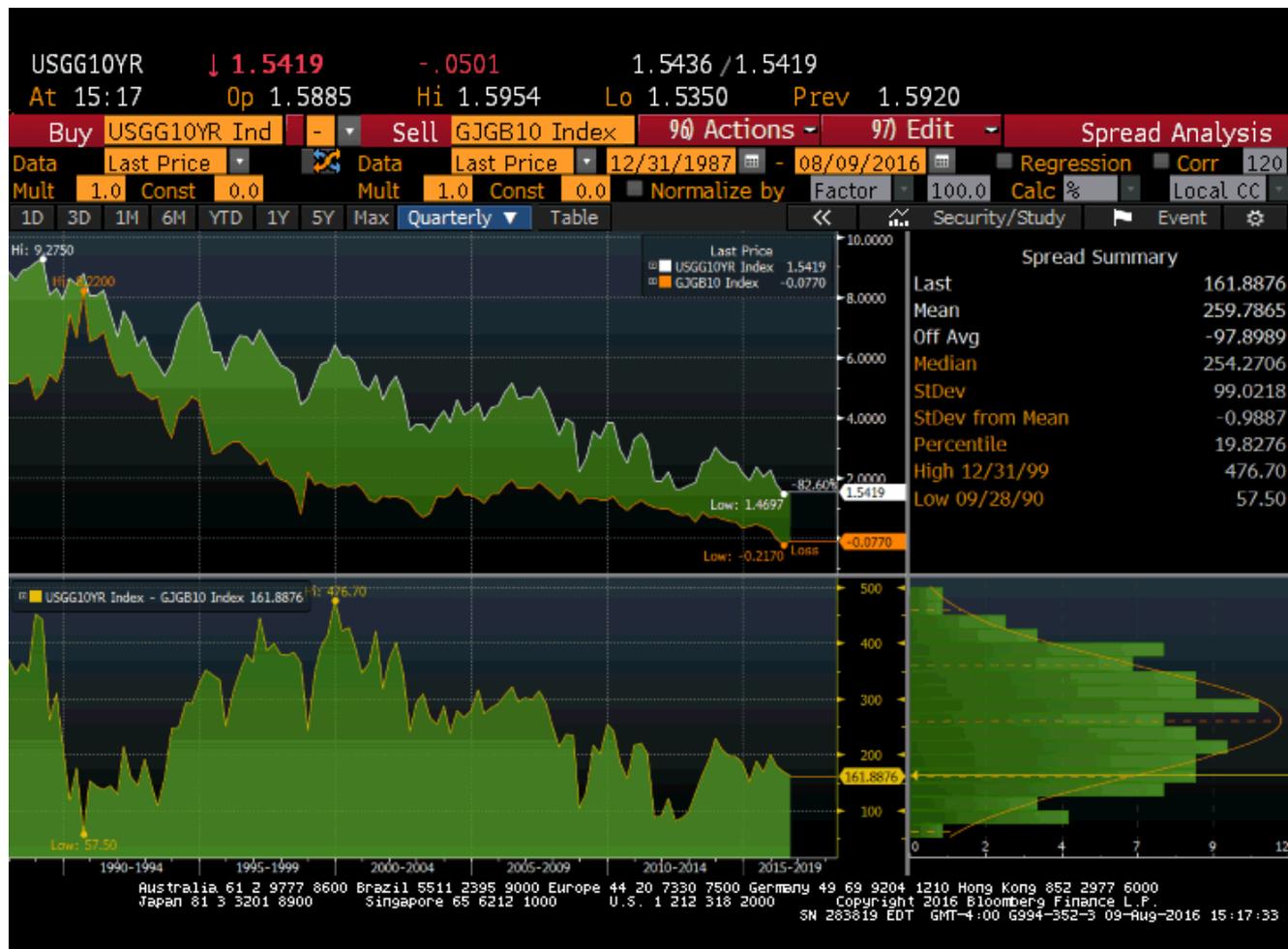
JAPAN 10 YEAR YIELD IS NEGATIVE



Source: Bloomberg

Ryan Labs Asset Management

US 10 YEAR YIELDS NOT AS LOW AS YOU THINK



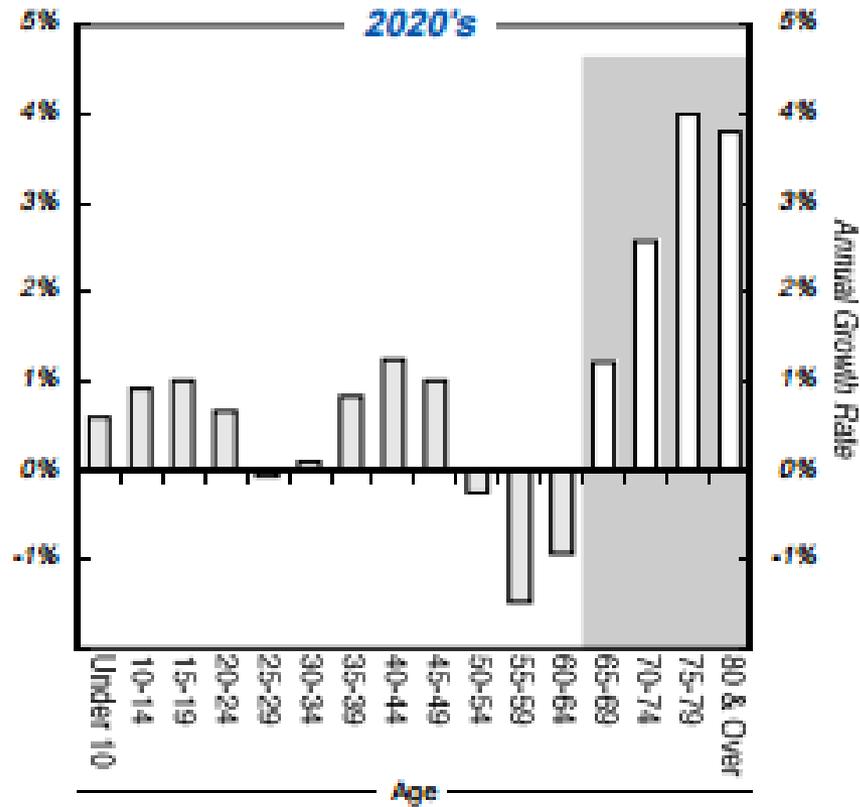
US 10 Year Yields vs. Japan 10 Year JGB



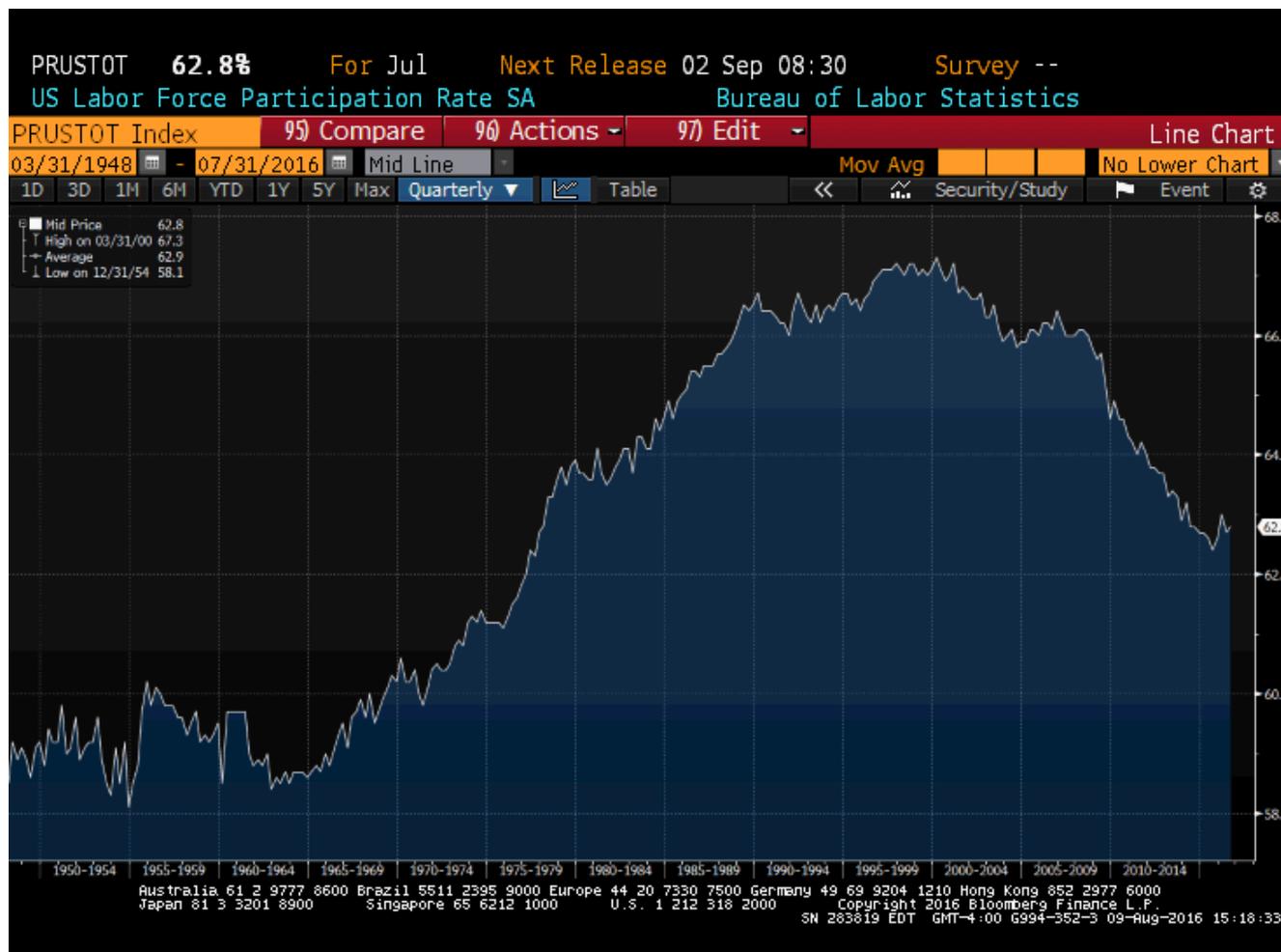
Source: Bloomberg

Ryan Labs Asset Management

AGES 65 AND OLDER – HIGHEST GROWING POPULATION SEGMENT



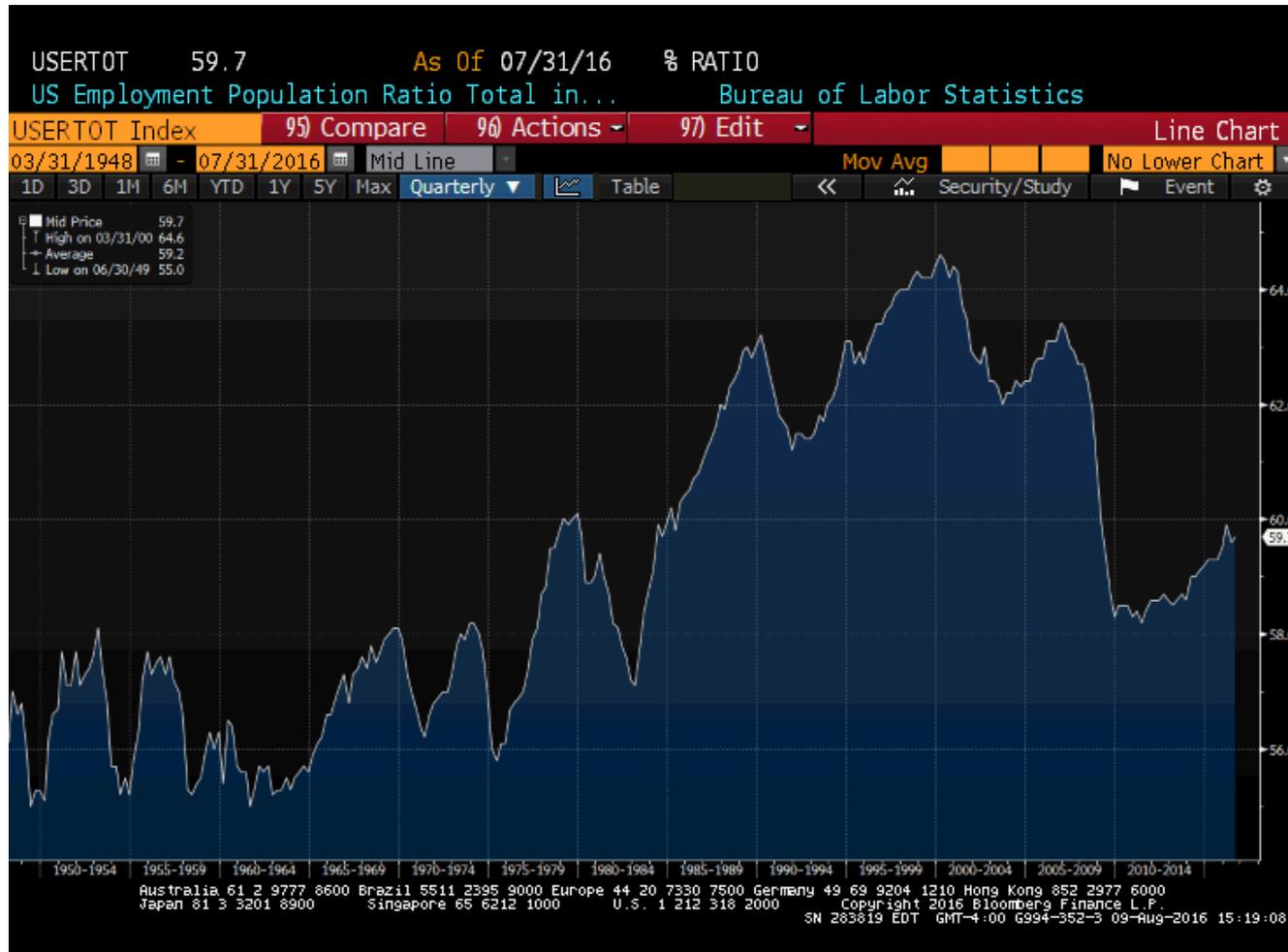
LABOR FORCE PARTICIPATION REMAINS LOW



Source: Bloomberg

Ryan Labs Asset Management

EMPLOYMENT OFF HISTORICAL LEVELS



Employment as Percent of Total US Population

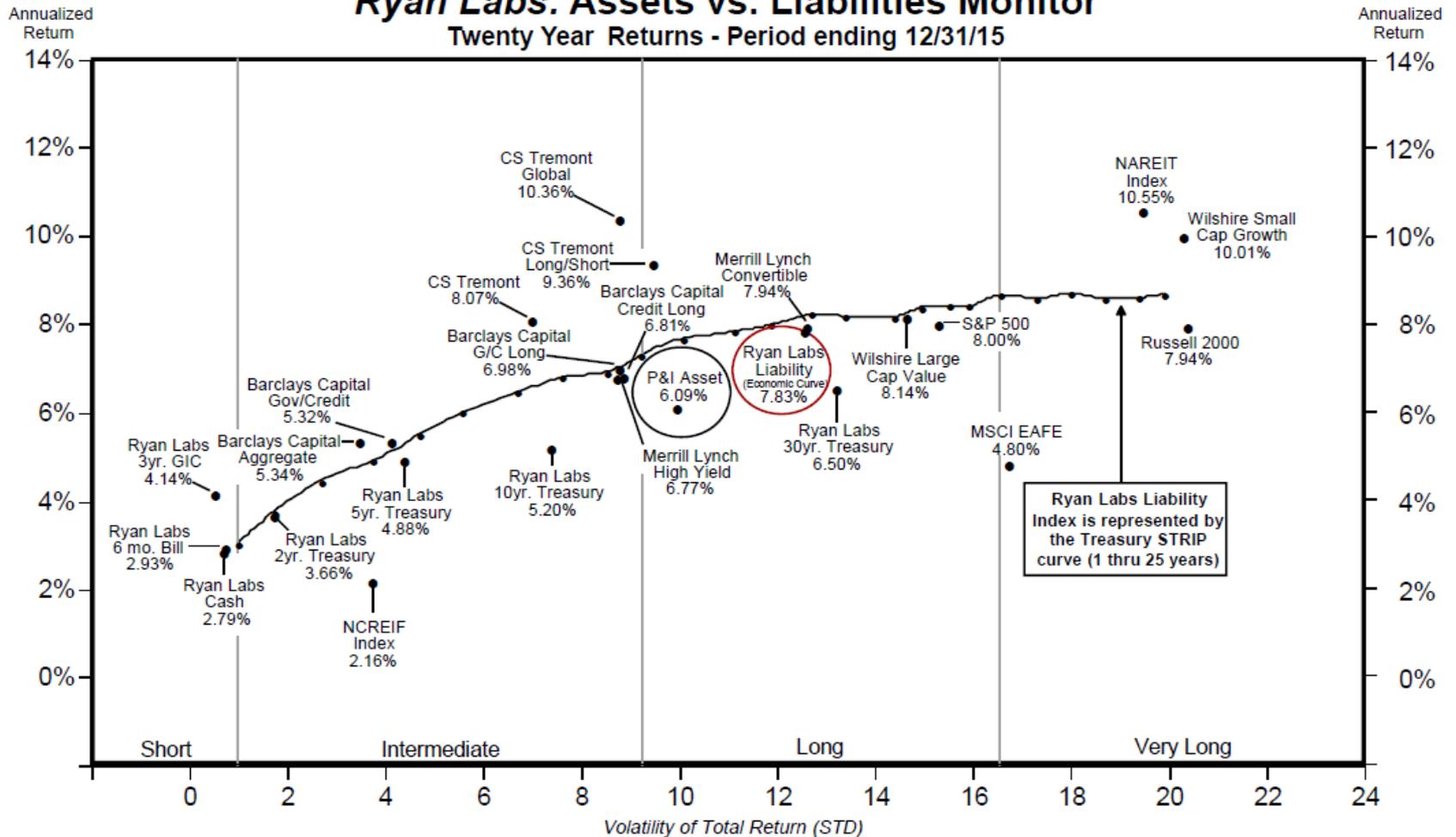


Source: Bloomberg

Ryan Labs Asset Management

Ryan Labs: Assets vs. Liabilities Monitor

Twenty Year Returns - Period ending 12/31/15



Sources: Ryan Labs, Inc. - Standard & Poor's Corporation - Barclays Capital - Merrill Lynch - Morgan Stanley Capital International
 Russell Investment Group - Wilshire Asset Management - Credit Suisse/Tremont - NAREIT - NCREIF - Crandall, Pierce & Company

The information presented herein was compiled from sources believed to be reliable. It is intended for illustrative purposes only, and is furnished without responsibility for completeness or accuracy. Past performance does not guarantee future results.



ASSET LIABILITY WATCH – AUGUST 31, 2016

Index	Estimated Weights (%)	Total Return		
		QTD (%)	YTD (%)	Last 12 Months (%)
Ryan Labs Cash	5	0.05	0.45	0.47
Barclays Aggregate Index	30	0.52	5.86	5.97
S&P 500	60	3.83	7.82	12.55
MSCI EAFE Int'l	5	5.16	0.91	0.37
Asset Allocation Model	100	2.71	6.61	9.50
Ryan Labs Liability (PPA)	100	4.04	20.27	20.54
Assets – Liabilities (PPA)		-1.33	-13.66	-11.04
Ryan Labs Liability (FAS 158)	100	2.44	17.75	19.27
Assets – Liabilities (FAS 158)		0.28	-11.13	-9.77
Ryan Labs Liability (TSY)	100	1.59	18.63	18.44
Assets – Liabilities (TSY)		1.12	-12.02	-8.93



ASSET LIABILITY WATCH – AUGUST 31, 2016

Index	Weights	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	8/16
Ryan Labs Cash	5%	1	1	3	5	5	3	1	0	0	0	0	0	0	0
Barclays Aggregate	30%	4	4	2	4	7	5	6	7	8	4	-2	6	1	6
S&P 500	60%	29	11	5	16	5	-37	26	15	2	13	30	11	-1	8
MSCI EAFE Int'l	5%	39	21	14	27	12	-43	32	8	-12	18	23	-4	0	1
Asset Allocation Model	100%	20	9	5	12	6	-24	19	12	3	11	18	8	0	7
RL PPA Liability		7	11	6	2	2	10	6	14	21	9	-7	14	-3	20
Return Difference		13	-2	-1	10	4	-35	13	-2	-18	2	25	-6	3	-14
Funding Ratio (RL PPA)		93	91	90	98	102	70	78	77	66	67	85	81	83	74
Liabilities (TSY)		2	10	10	1	11	42	-26	9	31	3	-15	28	-2	19
Return Difference		18	-1	-5	11	-4	-67	45	2	-28	8	33	-20	2	-12
Funding Ratio (Economic)		77	76	72	80	77	41	66	67	53	57	79	67	68	62

Notes: RL PPA liability curve is the spot curve of the replication of IRS PPA curve (US credit A to AAA).
 RL Treasury liability curve is the proxy for economic liabilities.

Assumptions: Normal costs = annual contributions
 No benefit enhancements



THE CREDIT CYCLE



THE CREDIT CYCLE

What is it?

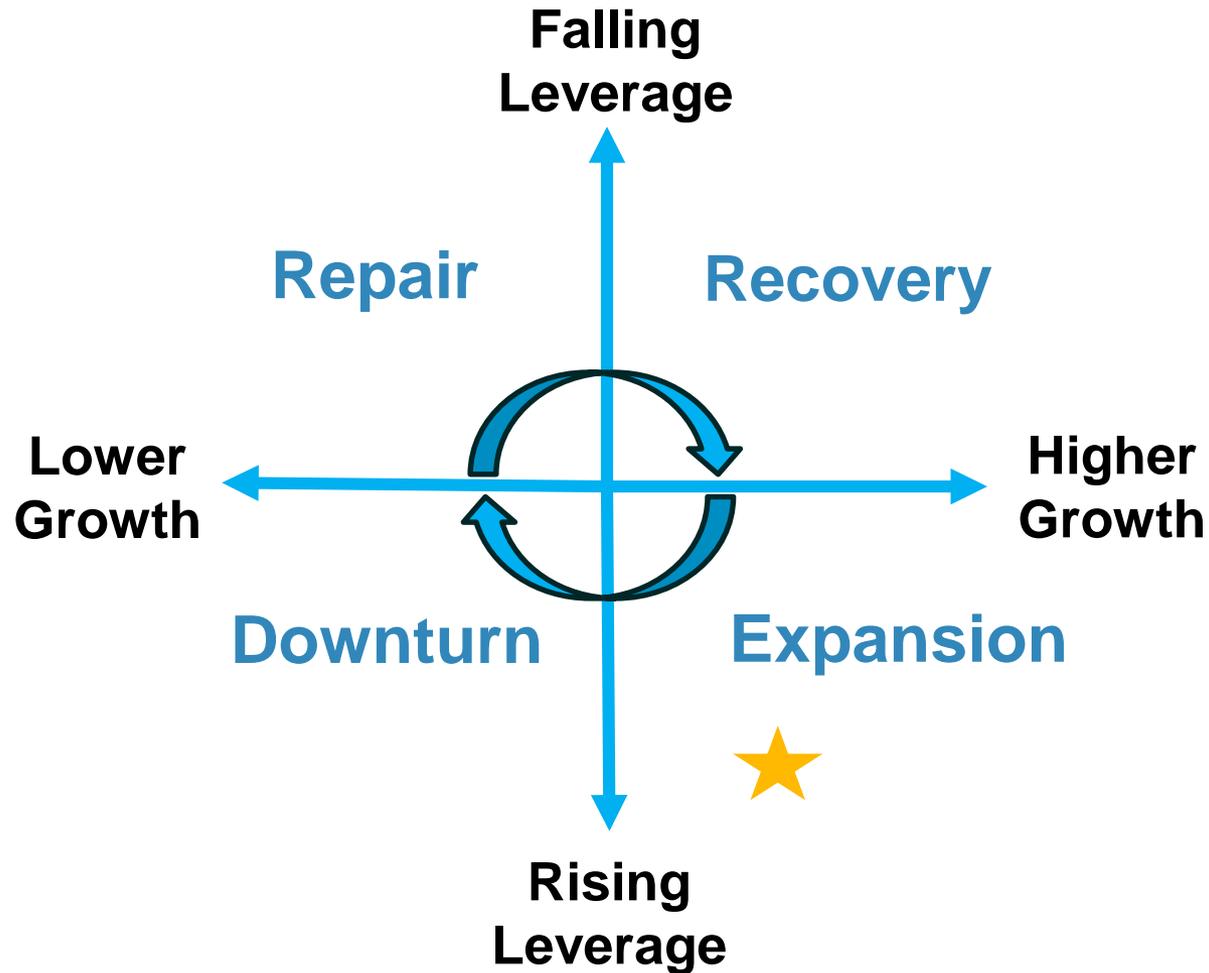
- The credit cycle tracks the expansion and contraction of access to credit over time.

Why is it important?

- Influences the overall business cycle because access to credit affects a company's ability to invest
- Overtime, performance of credit-oriented fixed income sectors are directly linked
- Sequence of events typically “rhyme”, not necessarily repeat



THE FOUR PHASES OF THE CREDIT CYCLE



THE FOUR PHASES OF THE CREDIT CYCLE

Repair Stage

- After economic downturn
- Companies repay debt
- Focus on cost cutting & cash generation
- Corporate bond spreads typically decline
- Economic growth improves

Recovery Stage

- Profit margins improved
- Restricted balance sheets
- Reduced debt
- Free cash flows grows
- Corporate bond spreads continue to decline
- Economy continues to improve

Expansion Stage

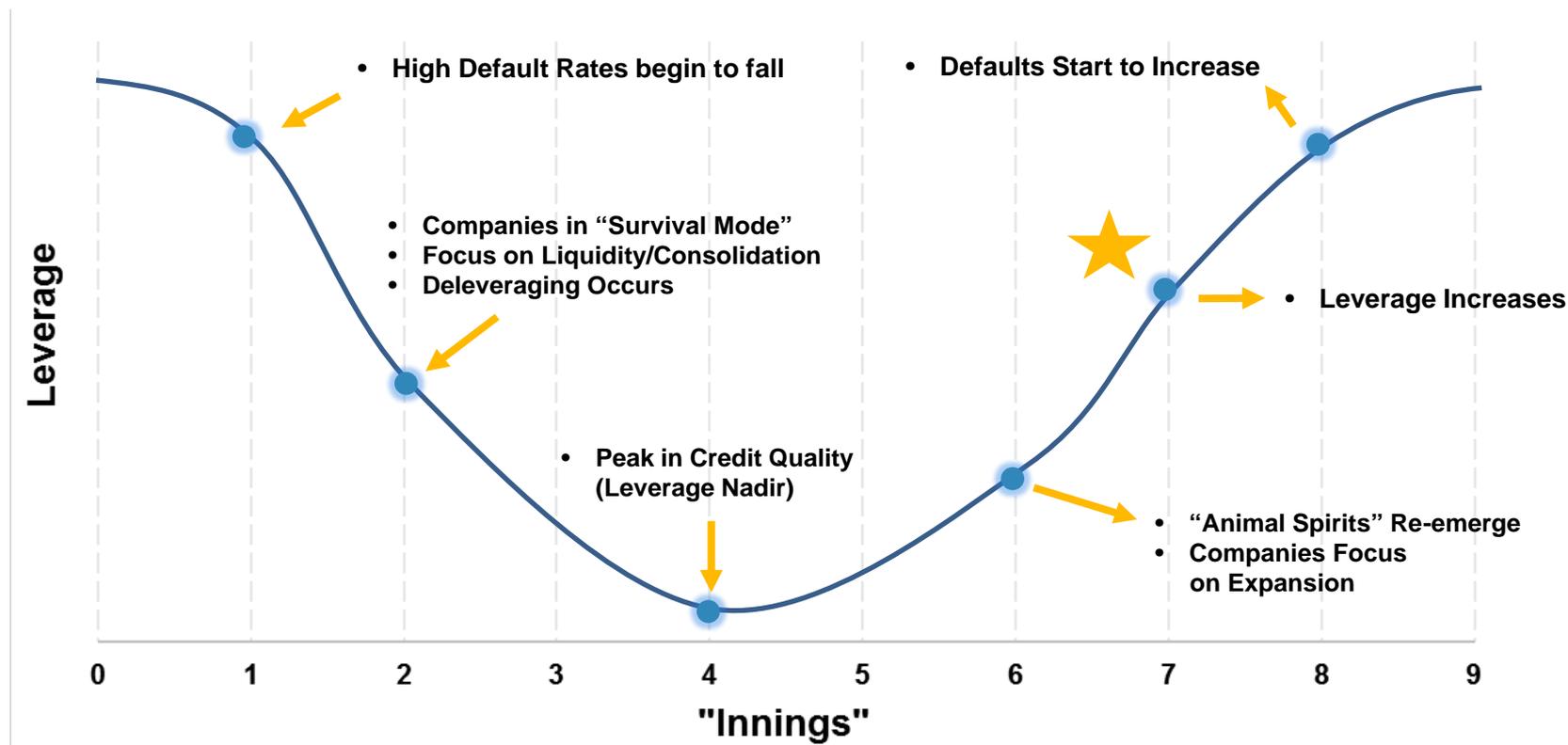
- Strengthening economy
- Confidence improves
- Banks increase lending
- Corporations increase borrowing
- Corporate bonds face higher volatility
- Credit Cycle peaks

Downturn Stage

- Slowing corporate growth
- Increased borrowing
- Lower earnings
- Banks reduce lending & tighten lending requirements
- Corporate bond spreads widen & prices fall
- Economic slowdown or recession



CREDIT CYCLE: DELEVERAGING, THEN LEVERAGING



"History never repeats itself, but it does rhyme." – Mark Twain

EVIDENCE OF A LATE-CYCLE CREDIT ENVIRONMENT

Flattening Treasury Curve

High and Rising Leverage

Tightening Credit Conditions

Peaking Margins

Fall in M&A Activity

Modest Slowdown in Employment

Possible Federal Reserve Rate Hike



RL TREASURY YIELDS (12/31/2011 to 8/31/2016)



8/31/2016 Yield (%)

2 Year TSY	0.795
5 Year TSY	1.181
7 Year TSY	1.439
10 Year TSY	1.569
30 Year TSY	2.231

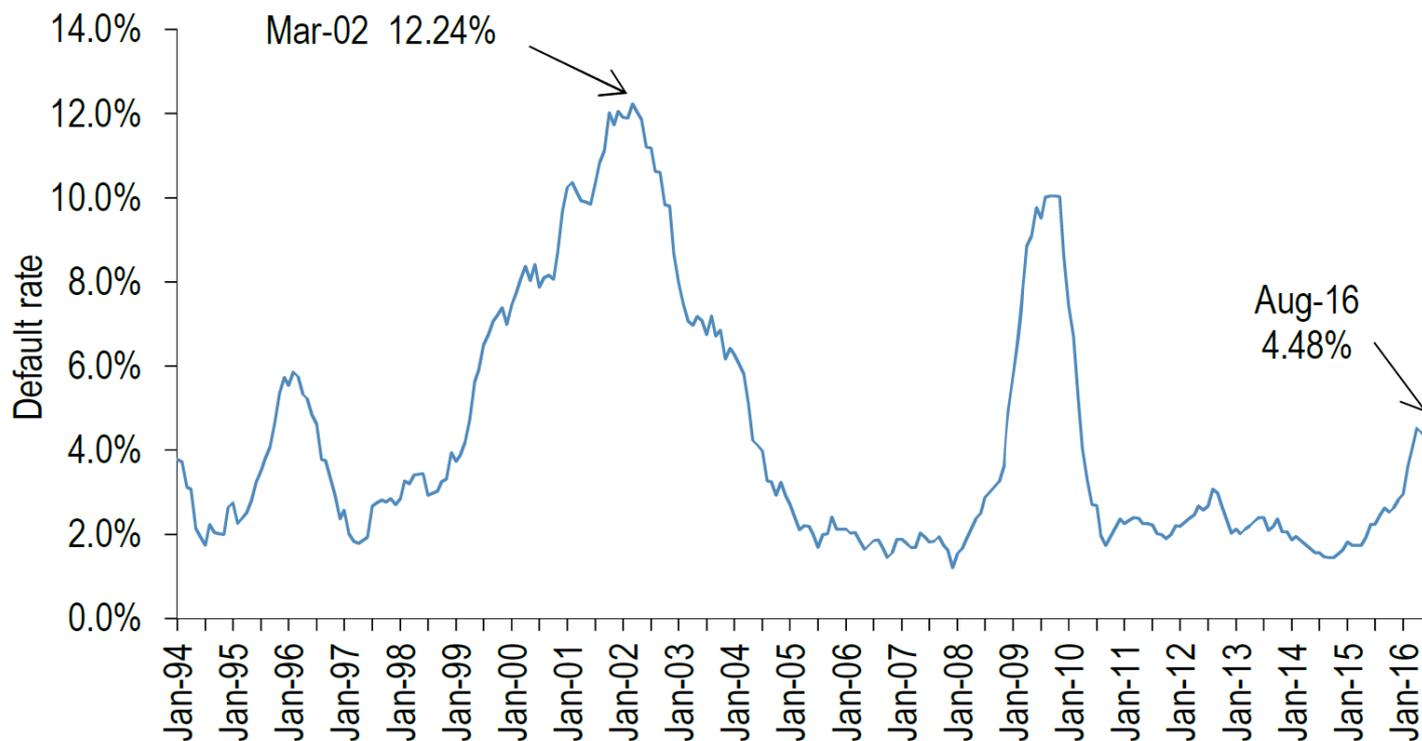


Source: RL Indices

Ryan Labs Asset Management

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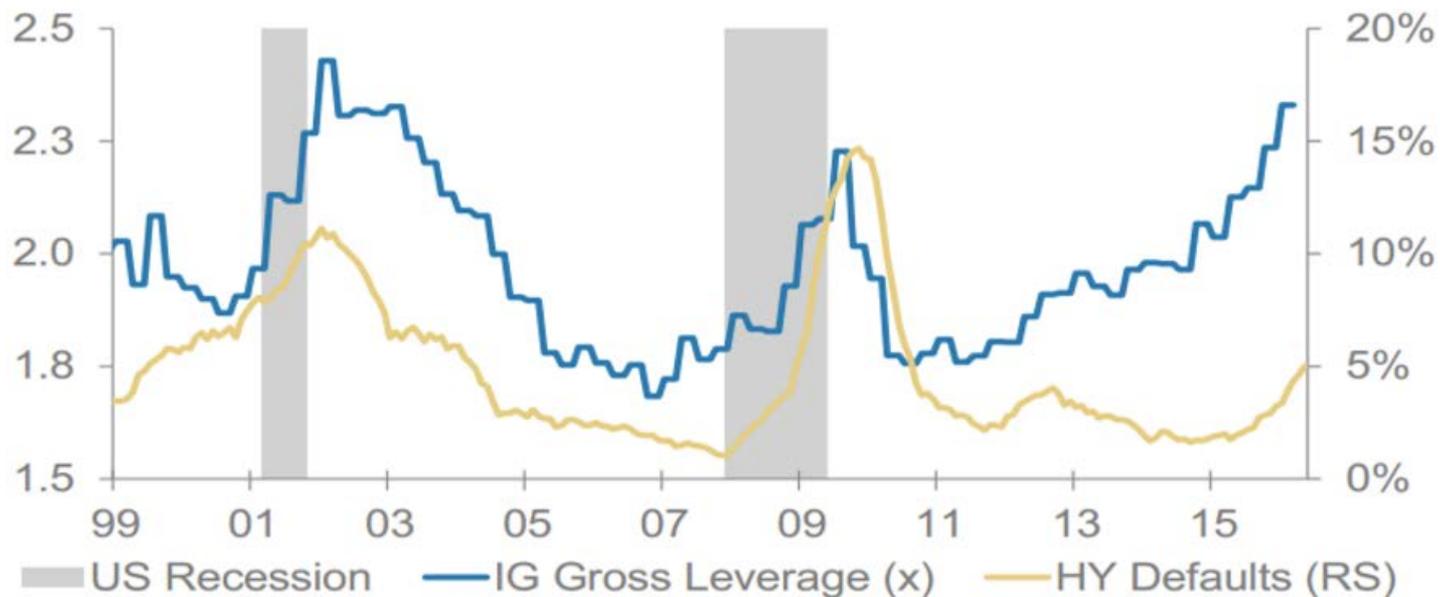
RISING HIGH YIELD DEFAULT RATE



Note: Long term default high yield rate based on number of issues



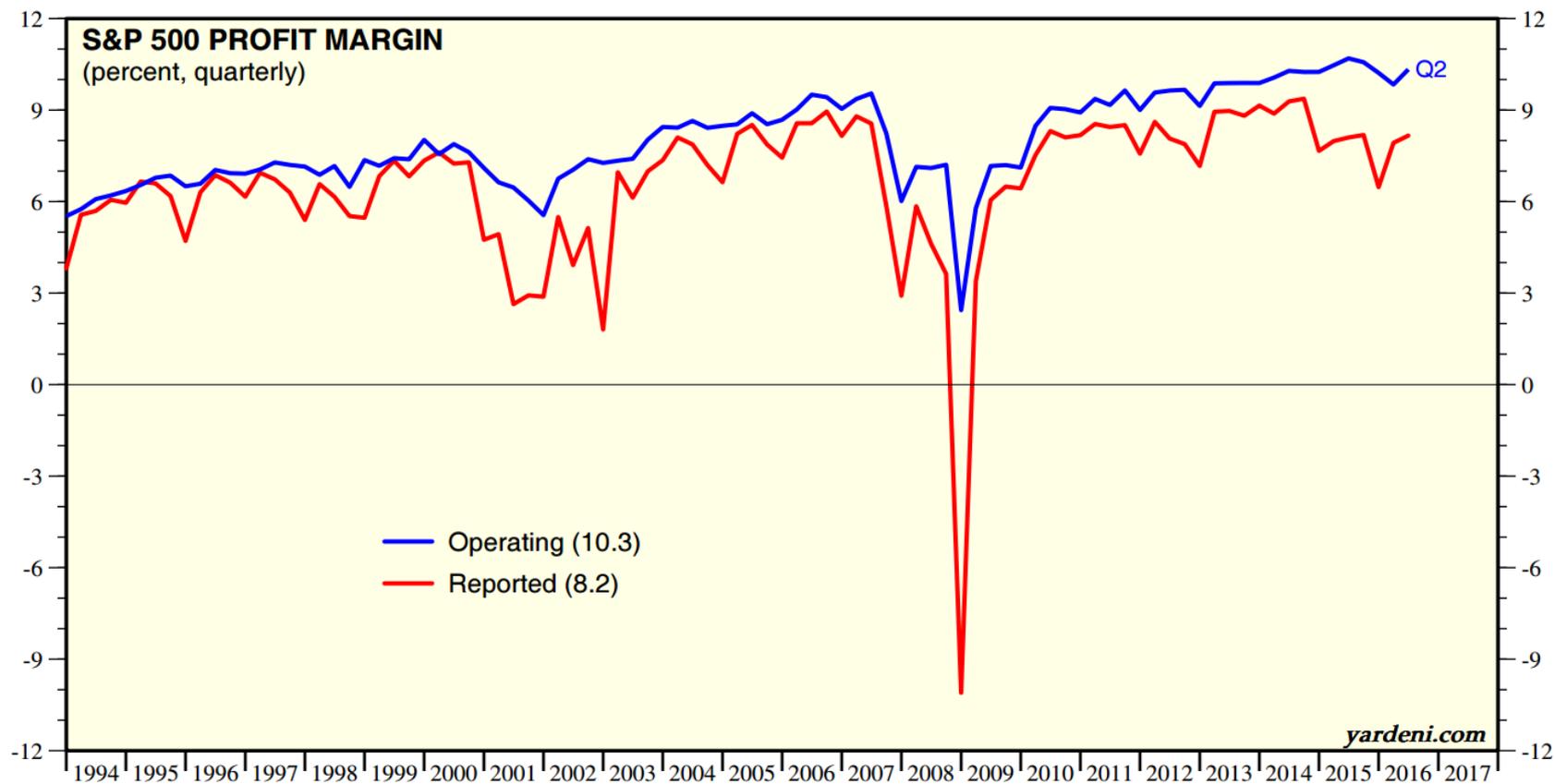
HIGH AND RISING LEVERAGE



Notes: Assumes US bond issuer default rates for 2001, 2009, and current. Assumes US speculative grade default rate for 19



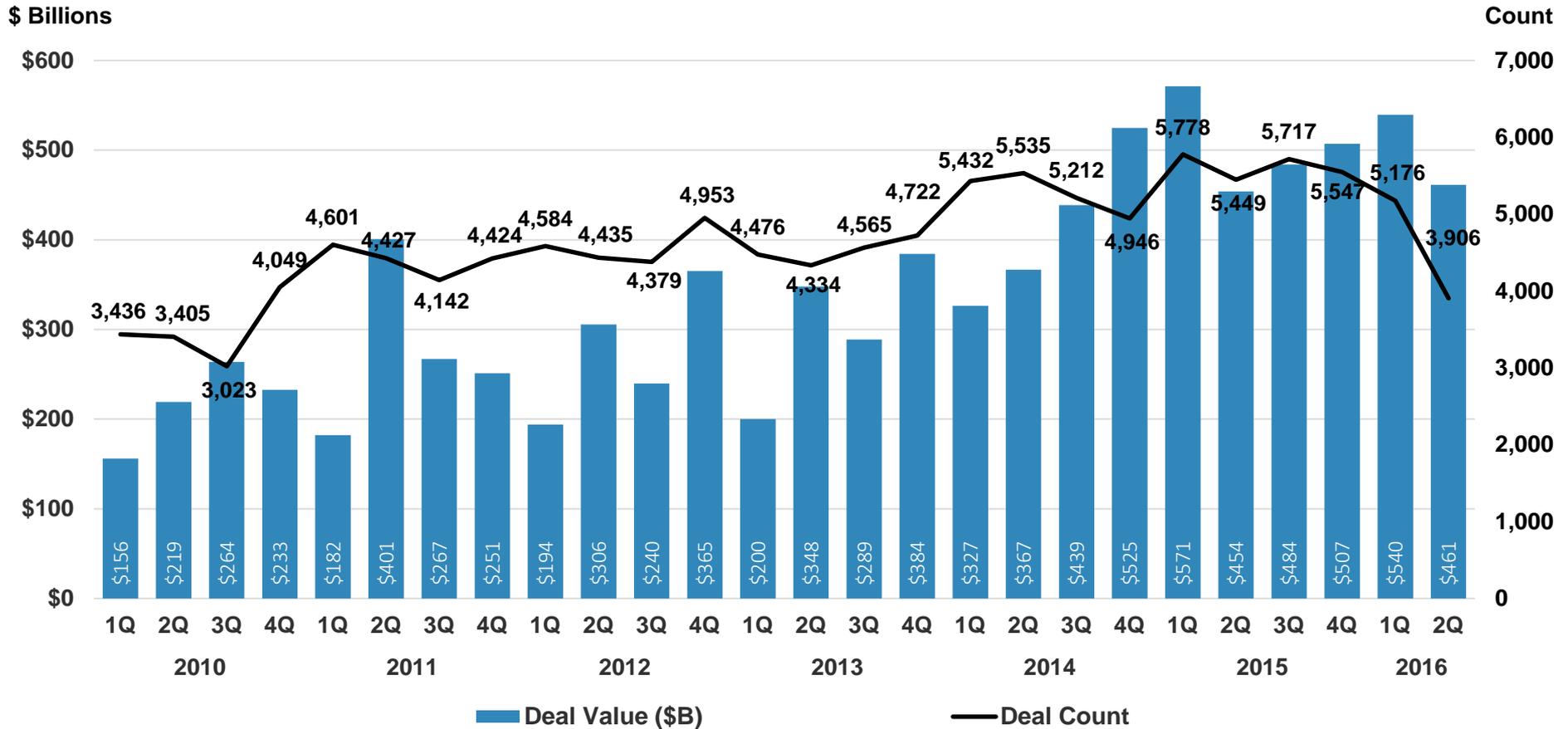
LOWER CORPORATE MARGINS



Notes: Assumes US bond issuer default rates for 2001, 2009, and current. Assumes US speculative grade default rate for 19



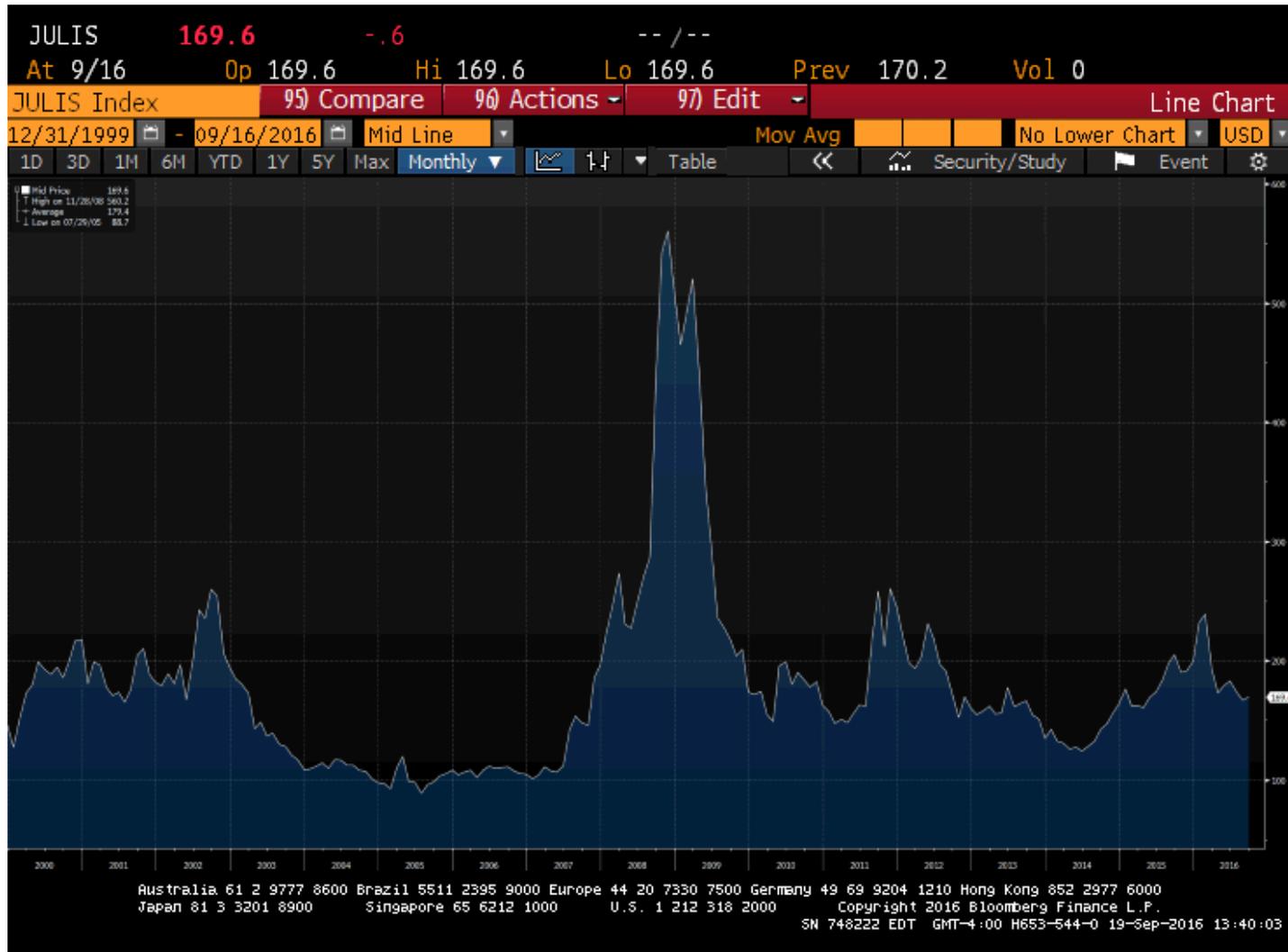
FALL IN M&A ACTIVITY



Source: Pitchbook Data

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HISTORICAL CREDIT SPREADS



Source: Bloomberg

Ryan Labs Asset Management

IMPLICATIONS OF A FED RATE HIKE

Overnight Rate (Federal Funds Rate) Increases

- Interest Rate at which depository institutions trade federal funds with each other overnight
- Central Interest Rate in the U.S. financial market

Discount Window Lending Rate Increases

- Short term funding for financial institutions in three forms:
 - (1) Primary Credit
 - (2) Secondary Credit
 - (3) Seasonal Credit

Prime Rate Increases

- Credit rate that banks extended to their most credit-worthy clients
 - Primary index for most credit cards, home equity loans, and lines of credit
- Typically 300 basis points (3%) over the Federal Funds Rate

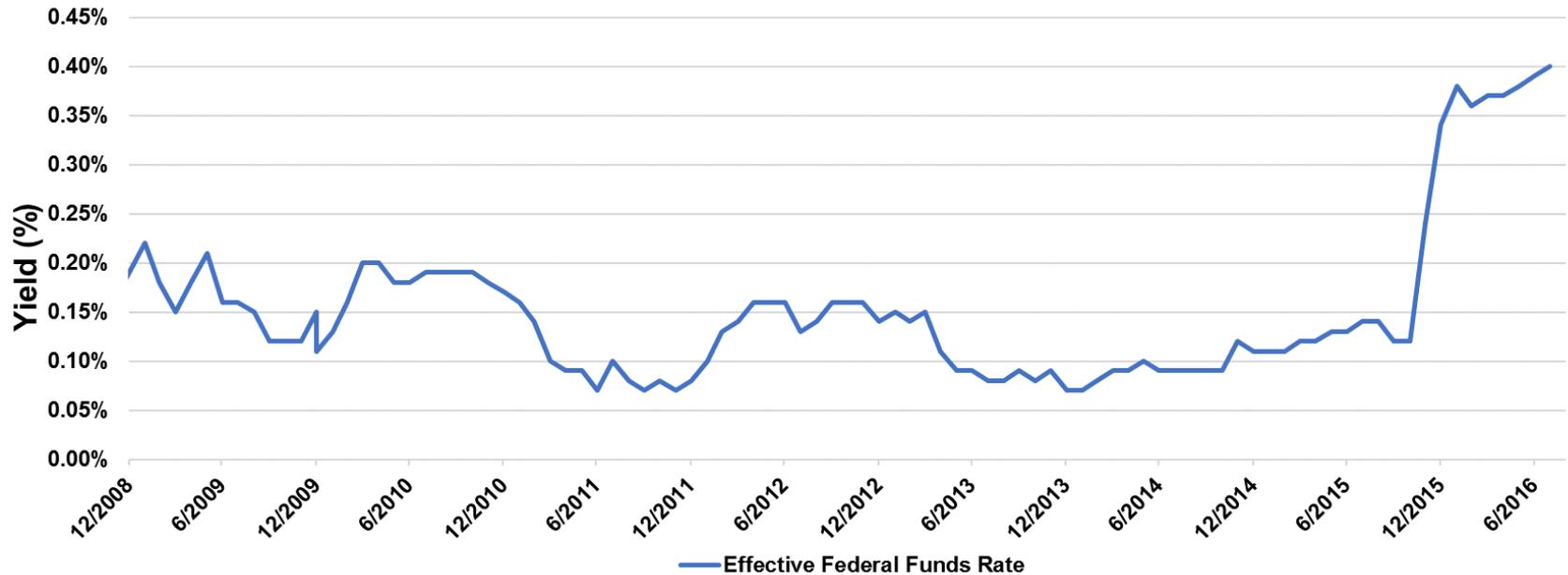
Short Duration Curve Rises

Long Duration Curve Flattens

Heightened Volatility



OVERNIGHT RATE (FEDERAL FUNDS RATE) 12/31/2010 TO 7/31/2016



Source: Federal Reserve Bank of St. Louis

Ryan Labs Asset Management

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CONCLUSION

Low Growth Scenario

Demographics Drive GDP

Higher Overnight Rates does not mean higher Longer Term Yields

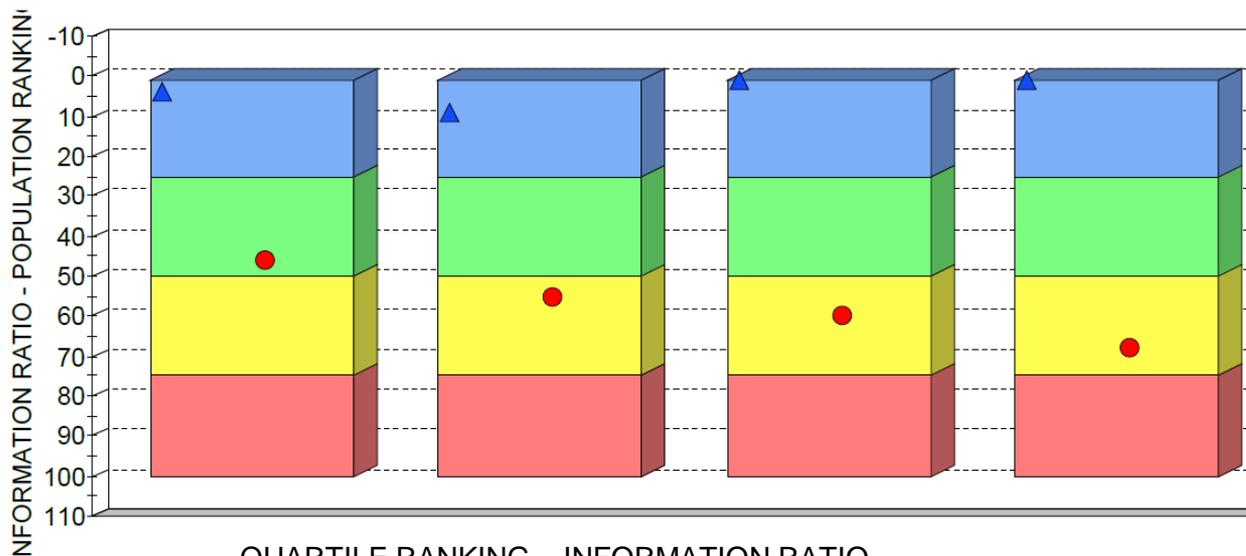
Low Liquidity Environment

High / Rising Leverage + Peaking Margins = Late Cycle Environment

Current Market Environment lends itself to Active Management



PERFORMANCE AND INFORMATION RATIO QUARTILE RANKING ENDING 6/30/2016



QUARTILE RANKING – INFORMATION RATIO

	6/2013-6/2016		6/2011-6/2016		6/2006-6/2016		6/1996-6/2016	
	VALUE	RANK	VALUE	RANK	VALUE	RANK	VALUE	RANK
▲ Ryan Labs, Inc. Core Fixed Income	1.35	4	1.04	9	1.33	1	0.77	1
● Barclays Aggregate	0.00	46	0.00	55	0.00	60	0.00	68

QUARTILE RANKING – RATE OF RETURN

	6/2013-6/2016		6/2011-6/2016		6/2006-6/2016		6/1996-6/2016	
	VALUE	RANK	VALUE	RANK	VALUE	RANK	VALUE	RANK
▲ Ryan Labs, Inc. Core Fixed Income	4.87	6	4.58	14	6.25	6	6.43	7
● Barclays Aggregate	4.06	46	3.76	55	5.13	60	5.67	68

Source: Informa Investment Solutions (www.informais.com) Note: Performance presented above is gross of fees. There are 197 Firms and 401 Products in this universe. Ryan Labs Asset Management receives the PSN 6 star, Top Gun rating for our Core Strategy. 6 star is the top rating. While there is no payment required to be considered for, be awarded, or use the "Top Gun" award, Ryan Labs Asset Management purchases certain data services from Informa Investment Solutions, Inc.



APPENDIX

BOND MARKET WATCH

AUGUST 31, 2016

Yield and Total Returns									
Ryan Labs Indexes	YTW	QTD	YTD	12M ¹	Ryan Labs Indexes	YTW	QTD	YTD	12M ¹
RL 2 Year Indexes					RL 10 Year Indexes				
TIPS	-0.27	-0.32	2.39	1.81	TIPS	0.19	0.36	7.75	6.15
Treasury (OTR)	0.80	-0.23	1.10	0.87	Treasury (OTR)	1.57	-0.55	7.38	7.36
Financials	1.75	0.40	2.85	3.36	Financials	3.28	2.00	9.32	11.11
Industrials	1.60	0.31	3.29	3.43	Industrials	3.13	1.42	12.68	13.79
Utilities	1.87	0.29	3.58	3.17	Utilities	3.23	1.70	13.02	12.41
AAA Corporate	1.08	-0.14	1.95	2.13	AAA Corporate	2.43	0.67	9.00	10.39
AA Corporate	1.30	0.03	2.29	2.73	AA Corporate	2.65	1.19	9.54	11.57
A Corporate	1.55	0.18	2.79	3.13	A Corporate	2.78	1.10	11.28	13.23
BBB Corporate	1.98	0.66	3.99	3.70	BBB Corporate	3.70	2.40	12.70	12.24
RL 5 Year Indexes					RL 30 Year Indexes				
TIPS	-0.09	-0.28	4.96	3.81	TIPS	0.58	4.15	18.83	15.36
Treasury (OTR)	1.18	-0.65	3.67	3.30	Treasury (OTR)	2.23	2.21	19.51	18.58
Financials	2.40	0.71	5.68	6.70	Financials	4.03	3.73	14.02	16.05
Industrials	2.27	0.76	6.84	7.33	Industrials	3.98	3.55	19.46	19.46
Utilities	2.47	0.83	8.59	7.56	Utilities	3.83	2.72	18.41	17.98
AAA Corporate	1.65	-0.06	4.45	4.62	AAA Corporate	3.22	2.68	16.85	19.53
AA Corporate	1.84	0.37	5.50	6.78	AA Corporate	3.46	2.80	16.72	19.16
A Corporate	2.08	0.53	6.03	6.82	A Corporate	3.72	3.15	17.19	18.19
BBB Corporate	2.76	1.25	7.76	7.32	BBB Corporate	4.51	4.25	20.90	18.53
Barclays Indexes					Barclays Indexes				
BC Aggregate	1.95	0.52	5.86	5.97	BC ABS	1.45	-0.07	2.47	2.35
BC Credit Long	3.96	3.36	17.75	17.39	BC MBS	2.04	0.32	3.44	3.95
BC High Yield	6.31	4.85	14.35	9.07	BC CMBS	2.08	0.80	6.77	6.72



BOND MARKET WATCH

AUGUST 31, 2016

Ryan Labs TIPS				
	Yield To Worst (%)	MDuration (Years)	Year To Date Returns (%)	Last 12 Month Returns (%)
2 Year TIPS	-0.27	2.30	2.39	1.81
5 Year TIPS	-0.09	5.23	4.96	3.81
10 Year TIPS	0.19	9.16	7.75	6.15
30 Year TIPS	0.58	22.74	18.83	15.36
RL TIPS Index	0.07	8.55	7.04	5.65

Market Implied Breakeven Inflation Expectation				
	Yield To Worst (%)		Inflation (%)	
	Nominals ¹	TIPS	BEI ²	Current ³
CPI (1 Month Lag)				0.8
2 Year	0.80	-0.27	1.06	
5 Year	1.18	-0.09	1.27	
10 Year	1.57	0.19	1.38	
30 Year	2.23	0.58	1.65	
RL Index	1.44	0.07	1.37	

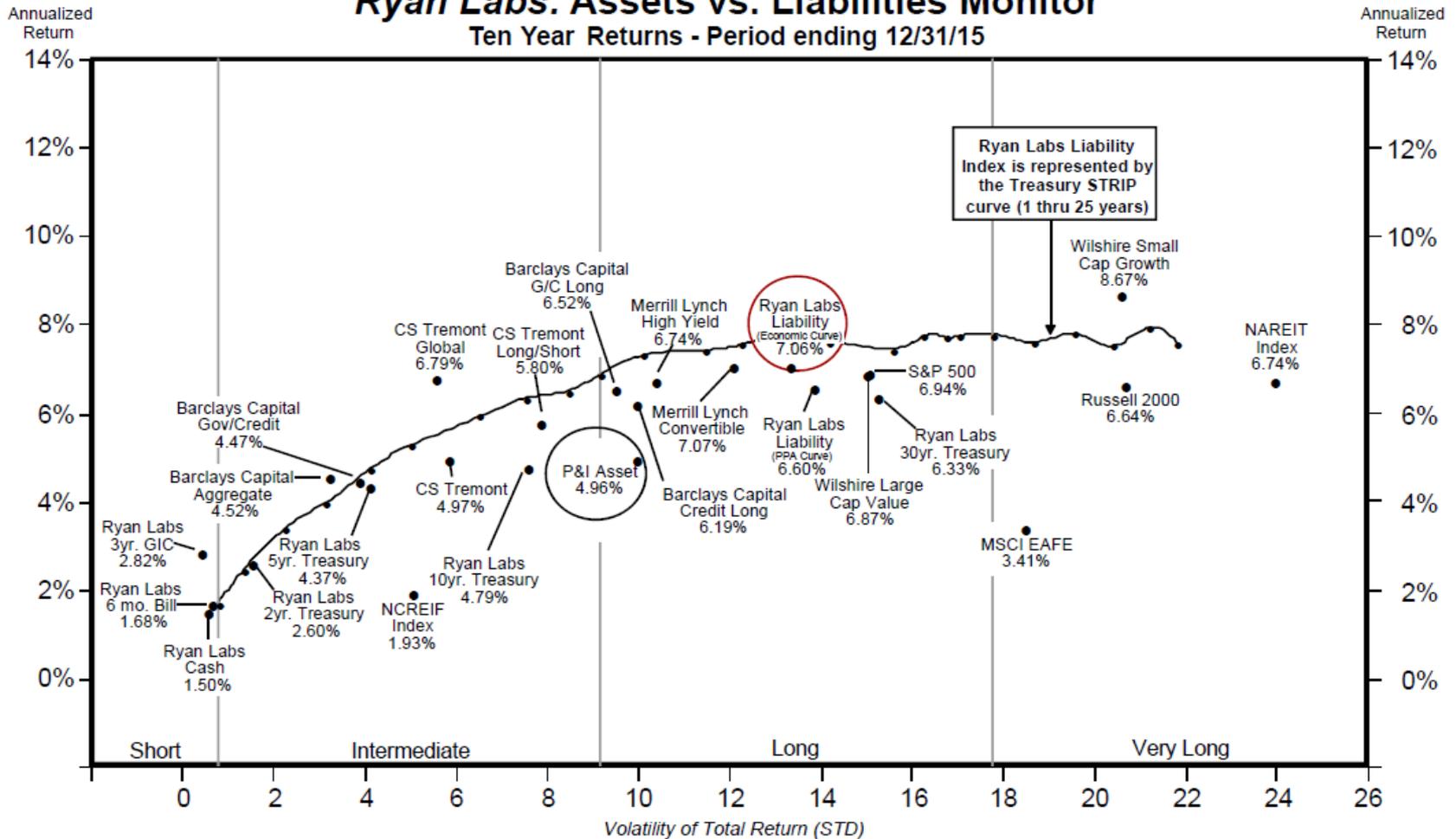
Assumptions:

1. Nominals represent conventional U.S. Treasury Bonds and Notes.
2. BEI = Breakeven Inflation Rate (Nominal yields minus TIPS yields). Widening BEI indicates that TIPS are outperforming nominal bonds. When realized inflation is greater than implied inflation, TIPS also outperform.
3. Current Inflation = Bureau of Labor Statistics, Year over Year Consumer Price Index (non-seasonally adjusted, all items, 1 month lag)



Ryan Labs: Assets vs. Liabilities Monitor

Ten Year Returns - Period ending 12/31/15

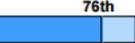
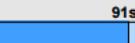
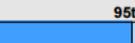
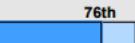
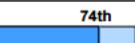
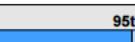
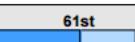
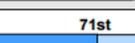
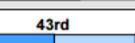
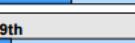
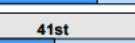
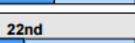
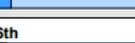
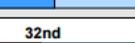
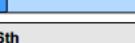
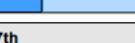
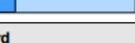
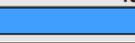
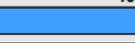
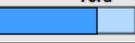
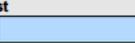
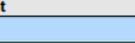
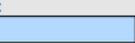
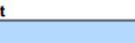


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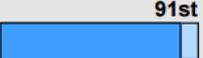
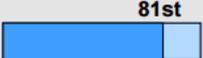
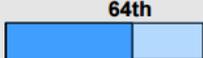
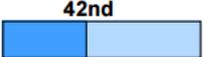
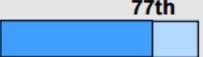
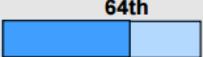
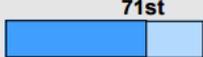
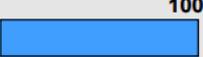
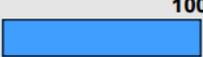
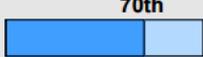


INTEREST RATES

Interest Rates	Latest Value	Perspectives		
		3 Years	5 Years	10 Years
3 Month Government Yields <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	0.33%	0.00%  0.34%	0.00%  0.34%	0.00%  5.16%
6 Month Government Yields <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	0.47%	0.03%  0.49%	0.03%  0.49%	0.03%  5.16%
1 Year Government Yields <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	0.61%	0.09%  0.68%	0.09%  0.68%	0.09%  5.09%
2 Year Government Yields <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	0.80%	0.28%  1.06%	0.22%  1.06%	0.20%  4.95%
3 Year Government Yields <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	0.92%	0.56%  1.31%	0.30%  1.31%	0.30%  4.92%
5 Year Government Yields <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	1.19%	1.01%  1.78%	0.59%  1.78%	0.59%  4.92%
7 Year Government Yields <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	1.45%	1.29%  2.45%	0.98%  2.45%	0.98%  4.96%
10 Year Government Yields <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	1.58%	1.46%  3.04%	1.46%  3.04%	1.46%  5.03%
20 Year Government Yields <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	1.90%	1.78%  3.72%	1.78%  3.72%	1.78%  5.21%
Federal Funds Rate <i>Data - End of Month; Percent Per Annum Last Observation - July 2016</i>	0.30%	0.06%  0.30%	0.04%  0.30%	0.04%  5.41%
Prime Rate <i>Data - End of Month; Percent Per Annum Last Observation - July 2016</i>	3.50%	3.25%  3.50%	3.25%  3.50%	3.25%  8.25%
LIBOR - 3 Month <i>Data - End of Month; Percent Per Annum Last Observation - August 2016</i>	0.84%	0.22%  0.84%	0.22%  0.84%	0.22%  5.62%
Aaa Corporate Bond Yields <i>Data - Monthly Average; Percent Per Annum Last Observation - July 2016</i>	3.28%	3.28%  4.64%	3.28%  4.64%	3.28%  6.28%
Baa Corporate Bond Yields <i>Data - Monthly Average; Percent Per Annum Last Observation - July 2016</i>	4.22%	4.22%  5.47%	4.22%  5.47%	4.22%  9.22%
Municipal Bond Yields <i>Data - Monthly Average; Percent Per Annum Last Observation - July 2016</i>	2.83%	2.83%  4.82%	2.83%  4.82%	2.83%  5.56%
Conventional Mortgage Rates <i>Data - Monthly Average; Percent Per Annum Last Observation - July 2016</i>	3.44%	3.44%  4.49%	3.35%  4.49%	3.35%  6.70%

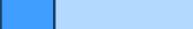
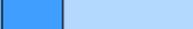
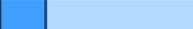
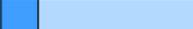
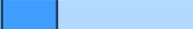
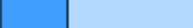
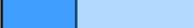
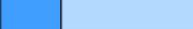
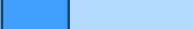
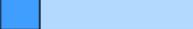
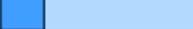
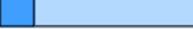
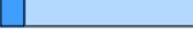
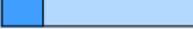
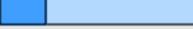
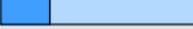
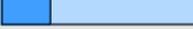


TOTAL RETURN – FIXED INCOME

Latest Value	Perspectives			
	3 Years	5 Years	10 Years	
Bonds				
Aggregate Bonds Data - Annual Growth Rate Last Observation - July 2016	5.93%	-2.5%  6.6%	-2.5%  8.7%	-2.5%  13.8%
High Yield Bonds Data - Annual Growth Rate Last Observation - July 2016	4.90%	-8.5%  11.8%	-8.5%  18.9%	-31.3%  64.1%
Municipal Bonds Data - Annual Growth Rate Last Observation - July 2016	7.09%	-4.3%  11.1%	-4.3%  15.2%	-5.1%  15.8%
Global Bonds Data - Annual Growth Rate Last Observation - July 2016	12.24%	-7.9%  12.3%	-7.9%  12.3%	-7.9%  19.7%
Treasury Bills Data - Annual Growth Rate Last Observation - July 2016	0.27%	0.0%  0.3%	0.0%  0.3%	0.0%  5.0%



TOTAL RETURN - EQUITIES

	Latest Value	Perspectives								
		3 Years		5 Years		10 Years				
Stocks										
Large Cap - Russell 1000 Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	4.85%	-7.2%	 29th	33.1%	-7.2%	 27th	33.1%	-43.6%	 31st	55.3%
Russell 1000 Growth Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	4.35%	-5.1%	 23rd	33.5%	-5.1%	 19th	33.5%	-40.0%	 28th	54.2%
Russell 1000 Value Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	5.38%	-9.4%	 34th	32.5%	-9.4%	 34th	32.7%	-47.4%	 38th	56.5%
Mid Cap - Russell Midcap Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	4.39%	-11.3%	 31st	34.8%	-11.3%	 34th	34.8%	-46.6%	 34th	71.0%
Russell Midcap Growth Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	1.07%	-10.8%	 20th	35.7%	-10.8%	 22nd	35.7%	-46.2%	 29th	67.1%
Russell Midcap Value Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	7.76%	-11.7%	 37th	33.5%	-11.7%	 41st	33.9%	-47.7%	 39th	74.7%
Small Cap - Russell 2000 Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	0.00%	-15.0%	 20th	41.0%	-15.0%	 24th	41.0%	-42.4%	 31st	63.9%
Russell 2000 Growth Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	-5.30%	-16.6%	 17th	44.5%	-16.6%	 12th	44.5%	-41.9%	 21st	61.9%
Russell 2000 Value Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	5.59%	-13.3%	 60th	37.6%	-13.3%	 54th	37.6%	-43.0%	 48th	65.9%
MSCI EAFE Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	-7.07%	-14.8%	 23rd	27.4%	-20.1%	 25th	32.2%	-49.9%	 25th	55.3%
MSCI Emerging Markets Index <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	-0.38%	-23.1%	 54th	20.4%	-23.1%	 51st	20.4%	-56.4%	 37th	92.1%

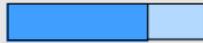
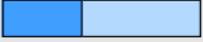


TOTAL RETURN - ALTERNATIVES

Alternatives	Latest Value	Perspectives		
		3 Years	5 Years	10 Years
Wilshire REIT Index Data - Annual Growth Rate Last Observation - July 2016	21.03%	-6.0% 80th 35.1%	-6.0% 86th 35.1%	-60.7% 67th 113.7%
Global Real Estate Data - Annual Growth Rate Last Observation - July 2016	5.48%	-10.3% 57th 21.4%	-13.5% 53rd 38.6%	-59.9% 45th 75.0%
Commodities Data - Annual Growth Rate Last Observation - July 2016	-7.98%	-28.2% 74th 8.2%	-28.2% 63rd 25.8%	-50.3% 41st 41.6%
Hedge Funds Data - Annual Growth Rate Last Observation - July 2016	-4.41%	-5.9% 14th 9.0%	-5.9% 15th 9.0%	-21.4% 18th 15.5%
		Min — Percentile — Max	Min — Percentile — Max	Min — Percentile — Max



VALUATION & INFLATION

Latest Value	Perspectives			
	3 Years	5 Years	10 Years	
Valuation				
S&P 500 Price / Earnings Ratio <i>Data - End of Month; Trailing 12 Month Earnings Last Observation - August 2016</i>	22.09	16.45  22.11	11.96  22.11	11.96  27.66
S&P 500 Earnings Yield <i>Data - End of Month; Trailing 12 Month Earnings Last Observation - August 2016</i>	4.53%	4.52%  6.08%	4.52%  8.36%	3.62%  8.36%
S&P 500 Dividend Yield <i>Data - End of Month; Trailing 12 Month Dividends Last Observation - August 2016</i>	2.05%	1.86%  2.25%	1.86%  2.25%	1.67%  3.86%
Inflation				
Consumer Price Index - All Items <i>Data - Annual Growth Rate Last Observation - July 2016</i>	0.84%	-0.2%  2.1%	-0.2%  3.9%	-2.1%  5.6%
Consumer Price Index - Core <i>Data - Less Food & Energy; Annual Growth Rate Last Observation - July 2016</i>	2.20%	1.6%  2.3%	1.6%  2.3%	0.6%  2.9%
Consumer Price Index - Food <i>Data - Annual Growth Rate Last Observation - July 2016</i>	0.22%	0.2%  3.4%	0.2%  4.7%	-0.7%  6.3%
Consumer Price Index - Energy <i>Data - Annual Growth Rate Last Observation - July 2016</i>	-10.88%	-19.6%  3.3%	-19.6%  19.3%	-28.1%  29.3%
Consumer Price Index - Medical Care <i>Data - Annual Growth Rate Last Observation - July 2016</i>	3.99%	2.0%  4.0%	1.9%  4.1%	1.9%  5.2%
Producer Price Index <i>Data - Processed Goods; Annual Growth Rate Last Observation - July 2016</i>	-3.71%	-8.3%  1.6%	-8.3%  10.4%	-15.2%  17.0%
		Min — Percentile — Max	Min — Percentile — Max	Min — Percentile — Max

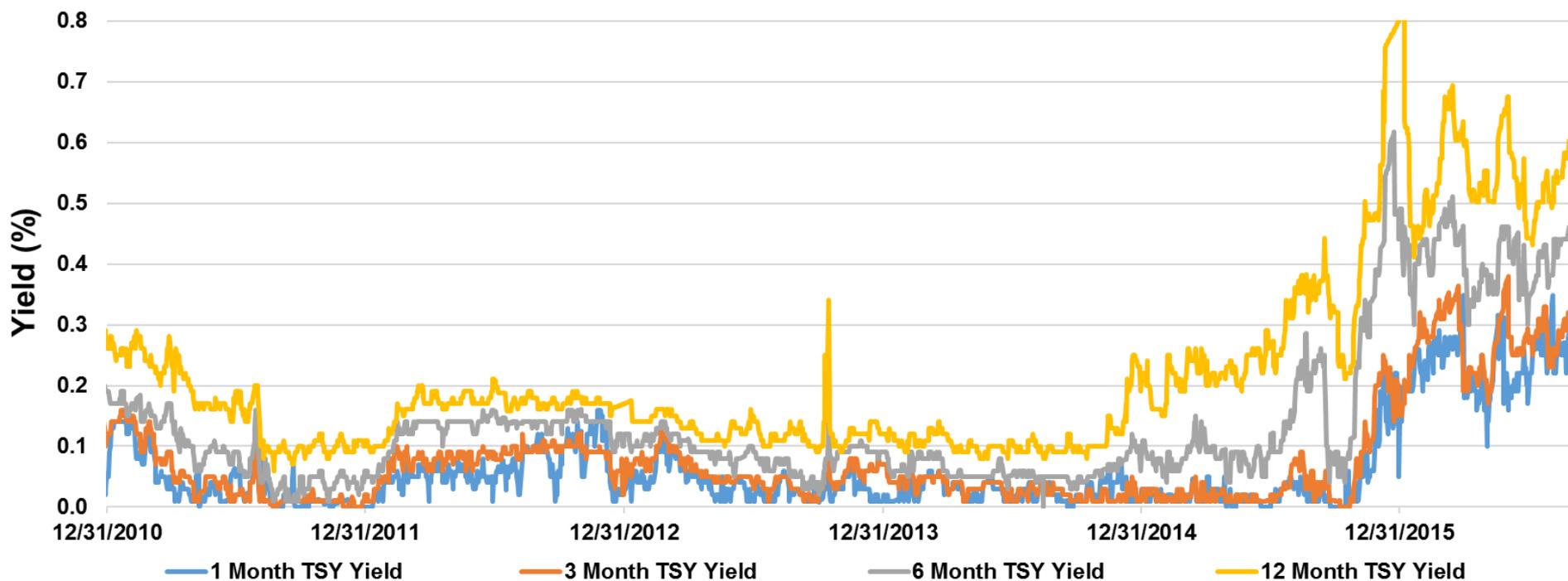


EMPLOYMENT, ECONOMY, & TRADE

Latest Value	Perspectives			
	3 Years	5 Years	10 Years	
Employment				
Weekly Initial Claims <i>Data - Monthly Average; Thousands</i> <i>Last Observation - July 2016</i>	259.6	3rd 258.0 353.2	2nd 258.0 415.6	1st 258.0 659.1
Unemployment Rate <i>Data - Official Unemployment Rate</i> <i>Last Observation - July 2016</i>	4.9%	3rd 4.7% 7.3%	2nd 4.7% 9.0%	14th 4.4% 10.0%
Unemployment Rate - U6 <i>Data - Broad Unemployment Rate</i> <i>Last Observation - July 2016</i>	9.7%	3rd 9.6% 13.7%	2nd 9.6% 16.4%	18th 7.9% 17.1%
Nonfarm Payrolls <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	1.72%	20th 1.6% 2.3%	47th 1.3% 2.3%	74th -5.0% 2.3%
Economy and Trade				
Gross Domestic Product (Nominal) <i>Data - Quarterly Percentage Change, Annualized</i> <i>Last Observation - 2nd Quarter 2016</i>	3.39%	55th 0.6% 6.6%	53rd 0.6% 6.6%	51st -7.9% 6.6%
Personal Consumption Expenditures <i>Data - Annual Growth Rate</i> <i>Last Observation - 2nd Quarter 2016</i>	3.72%	55th 2.8% 4.9%	58th 2.5% 5.1%	49th -3.2% 5.5%
Gross Private Domestic Investment <i>Data - Annual Growth Rate</i> <i>Last Observation - 2nd Quarter 2016</i>	-2.50%	1st -2.5% 11.0%	1st -2.5% 15.9%	21st -26.8% 21.2%
Leading Indicators <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	1.22%	6th 0.7% 6.7%	5th 0.7% 6.7%	36th -20.2% 9.7%
M2 Money Supply <i>Data - Annual Growth Rate</i> <i>Last Observation - July 2016</i>	7.12%	100th 5.4% 7.1%	68th 5.4% 10.3%	73rd 1.6% 10.3%
Federal Deficit <i>Data - Trillions of Dollars</i> <i>Last Observation - 2nd Quarter 2016</i>	-0.67	18th -0.71 -0.54	47th -1.23 -0.53	54th -1.35 -0.19
U.S. Trade Deficit <i>Data - Billions of Dollars</i> <i>Last Observation - June 2016</i>	-44.51	6th -48.2 -34.8	20th -51.0 -34.8	39th -67.8 -25.4
Net Exports <i>Data - Billions of Dollars</i> <i>Last Observation - 2nd Quarter 2016</i>	-495.5	73rd -534.7 -440.9	84th -614.7 -440.9	79th -805.6 -341.7



RL CASH YIELDS (12/31/2010 to 8/31/2016)



8/31/2016 Yield (%)

1 Month TSY	0.355
3 Month TSY	0.310
6 Month TSY	0.461
12 Month TSY	0.593

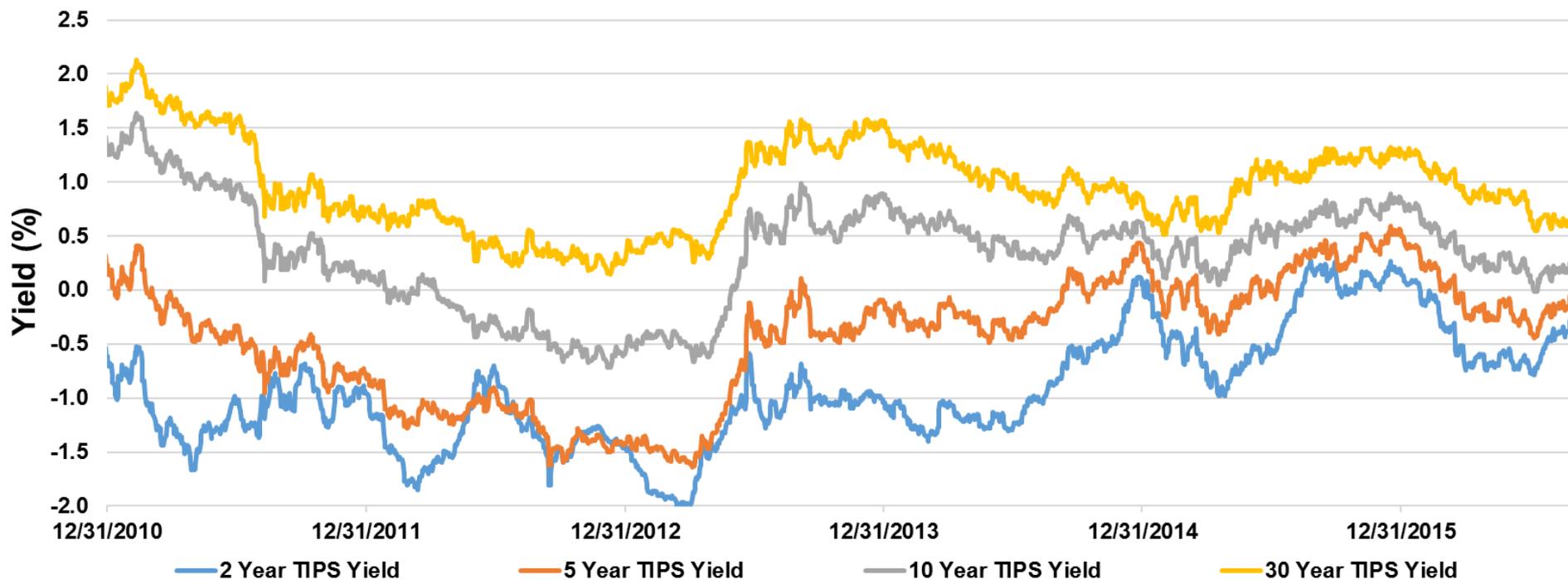


Source: RL Indices

Ryan Labs Asset Management

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RL TIPS YIELDS (12/31/2010 to 8/31/2016)



8/31/2016 Yield (%)

2 Year TIPS	-0.266
5 Years TIPS	-0.089
10 Year TIPS	0.194
30 Year TIPS	0.585

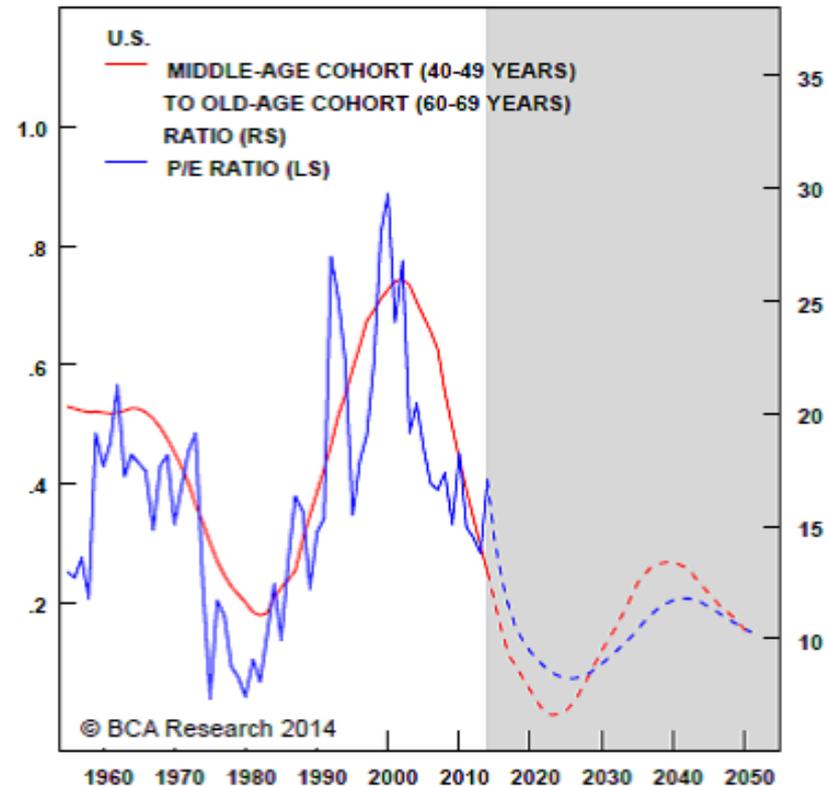


Source: RL Indices

Ryan Labs Asset Management

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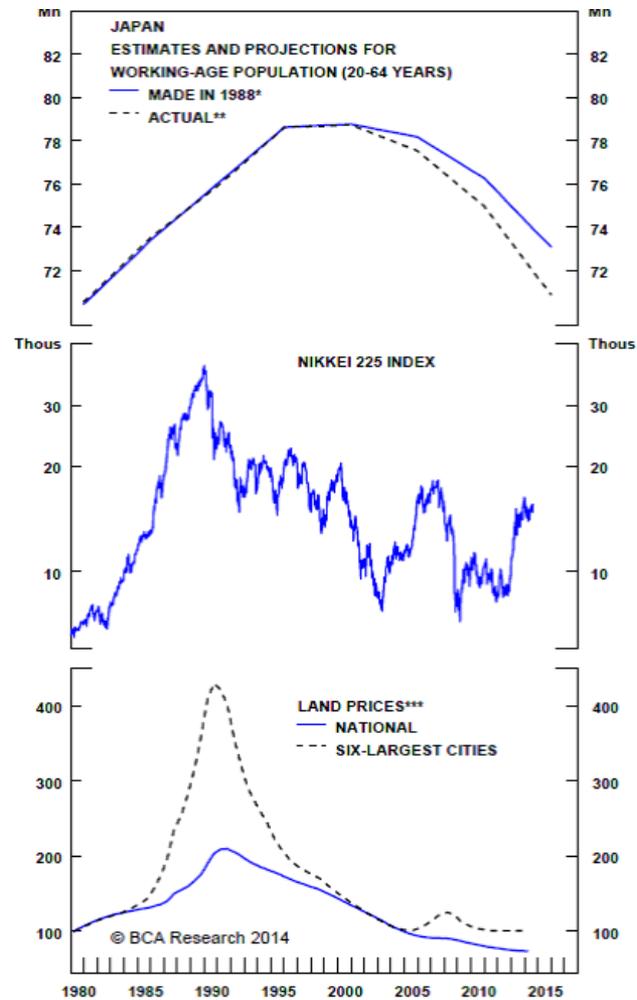
DO DEMOGRAPHICS DRIVE THE EQUITY MARKETS?



NOTE: SHADING AREA DENOTES BEGINNING OF FORECASTED VALUES. FORECAST FOR THE P/E RATIO IS BASED ON THE REGRESSION OF THE CHANGE IN THE P/E RATIO ON THE LAGGED VALUE OF THE P/E RATIO GAP, WHERE THE P/E RATIO GAP IS THE DIFFERENCE BETWEEN THE ACTUAL AND THE MODEL-GENERATED P/E RATIO. SOURCE: ZHENG LIU AND MARK M. SPIEGEL, "BOOMER RETIREMENT: HEADWINDS FOR U.S. EQUITY MARKETS?", FEDERAL RESERVE BANK OF SAN FRANCISCO ECONOMIC LETTER, AUGUST 22, 2011. DATA HAS BEEN UPDATED SINCE INITIAL PUBLICATION.



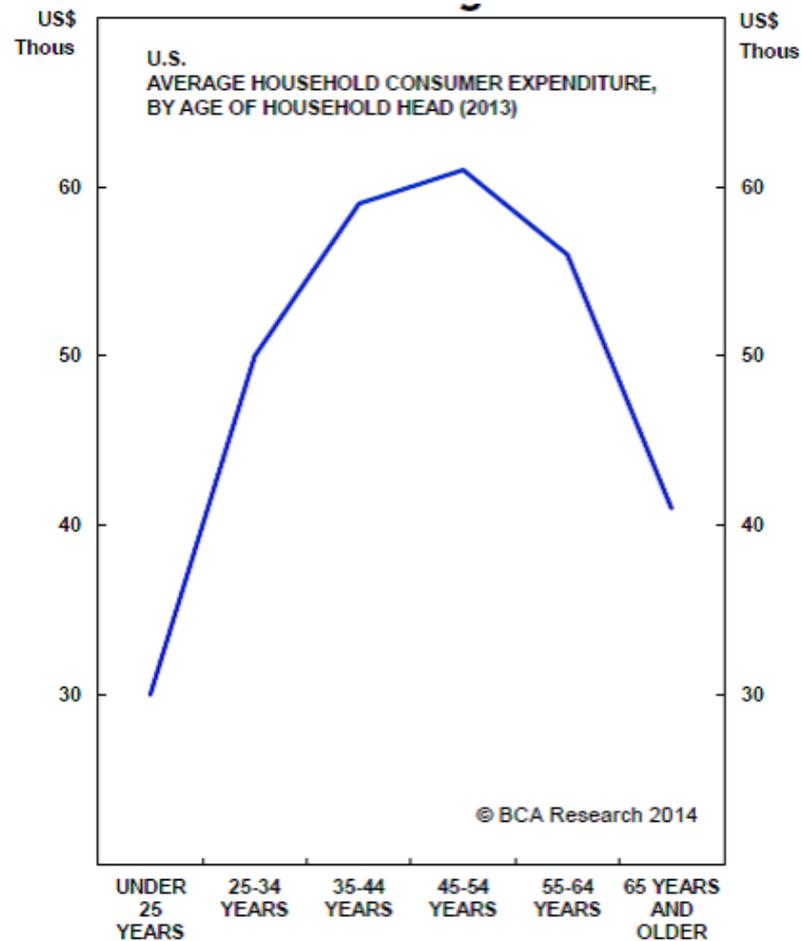
JAPAN'S POPULATION BUST WAS LARGELY FORESEEN



* MEDIUM VARIANT. SOURCE: UNITED NATIONS, WORLD POPULATION PROSPECTS (1988).
 ** MEDIUM VARIANT (2012). SOURCE: JAPAN NATIONAL INSTITUTE OF POPULATION AND SOCIAL SECURITY RESEARCH.
 *** REBASED TO 1980 Q1 = 100. SOURCE: JAPAN REAL ESTATE INSTITUTE.



SPENDING TENDS TO DECLINE IN OLD AGE



SOURCE: BUREAU OF LABOR STATISTICS.



Source: Bloomberg

Ryan Labs Asset Management

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