PERSI
Public Employee Retirement System of Idaho

Presentation to Economic Outlook and Revenue Assessment Committee

CAPITAL MARKET OUTLOOK

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Chief Investment Officer

January 4, 2018

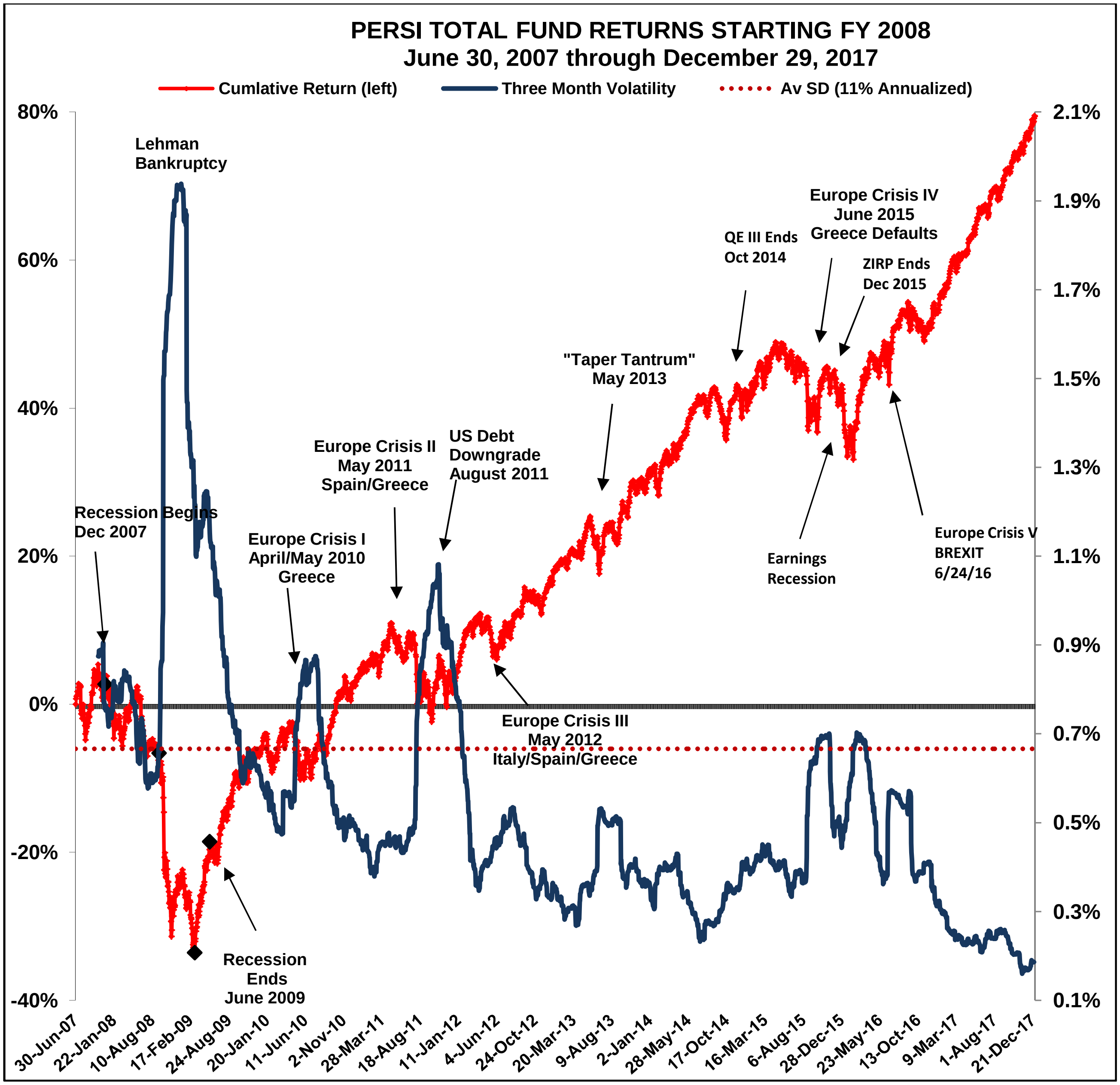
Capital Markets Outlook Warmer But Still Tepid (2017 Presentation]

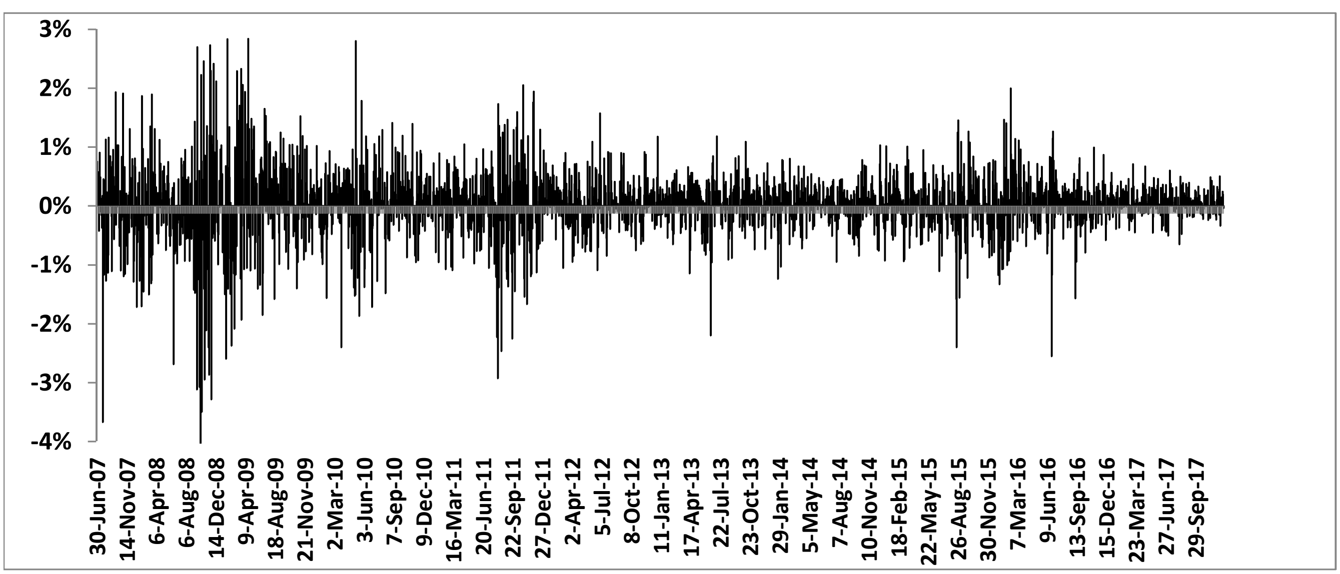
- No recession for a few years
- US Equities OK – 8%-9%
- US Bonds – Dead Money 2%
- US Dollar – Moderately higher
- Commodities – Have Bottomed
- EAFE – fairly valued vs US
- Emerging Markets – Likely will follow commodities
- No bubbles yet
  - Tech, homes, gold, oil, crb, and risk premia all within normal ranges

2018: GOLDILOCKEAN

- **ECONOMY HEALTHY**
  - **Positive Economic Surprises**
- **LABOR MARKETS STRONG**
- **INTEREST RATES LOW**
  - **Moderate increases expected**
  - **Accommodative Financial Conditions**
- **INFLATION BENIGN**
- **PROFITS HIGH**
  - **Expected Higher with Tax Cuts**
- **WORLD GROWTH SYNCRONIZED**
- **DOLLAR STRONG**
- **COMMODITIES REASONABLE**
- **RISK MEASURES LOW AND TRENDING DOWN**
- **NO BUBBLES APPARENT**

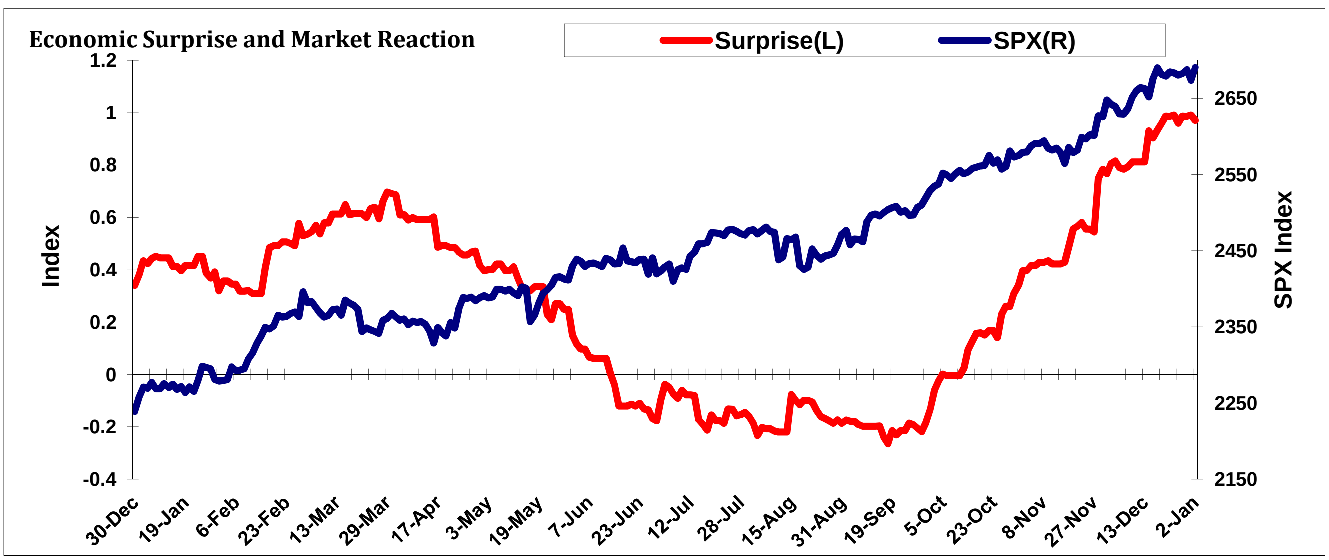
- **Equities: 8%-12%**
- **Bonds: 2%-3%**

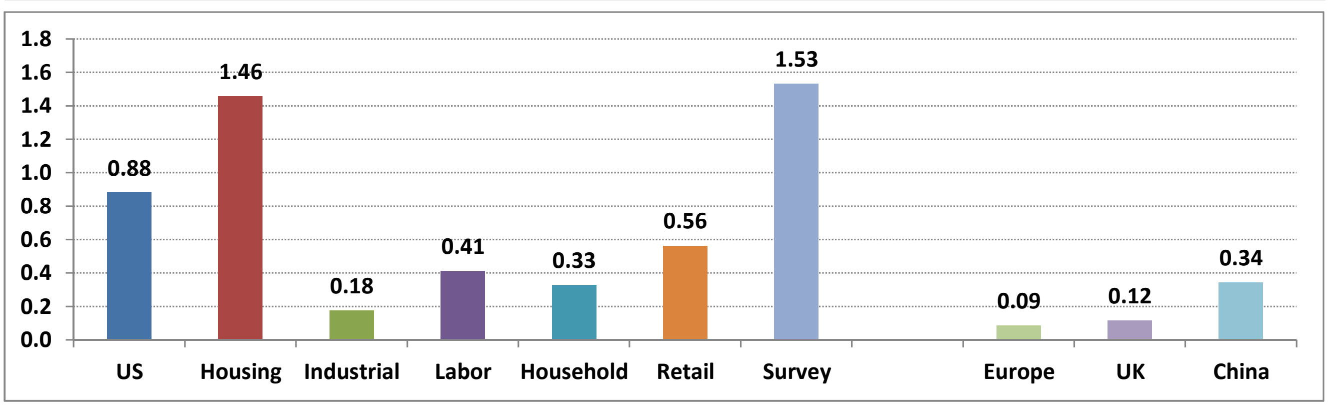

PERSI TOTAL FUND RETURNS STARTING FY 2008
June 30, 2007 through December 29, 2017
Cumlative Return (left)
Three Month Volatility
Av SD (11% Annualized)
80%
60%
40%
20%
0%
-20%
-40%
2.1%
1.9%
1.7%
1.5%
1.3%
1.1%
0.9%
0.7%
0.5%
0.3%
0.1%
Lehman Bankruptcy
Recession Begins Dec 2007
Europe Crisis I April/May 2010 Greece
Europe Crisis II May 2011 Spain/Greece
US Debt Downgrade August 2011
"Taper Tantrum" May 2013
Europe Crisis III May 2012 Italy/Spain/Greece
QE III Ends Oct 2014
Europe Crisis IV June 2015 Greece Defaults
ZIRP Ends Dec 2015
Earnings Recession
Europe Crisis V BREXIT 6/24/16
Recession Ends June 2009
30-Jun-07
22-Jan-08
10-Aug-08
17-Feb-09
24-Aug-09
20-Jan-10
11-Jun-10
2-Nov-10
28-Mar-11
18-Aug-11
11-Jan-12
4-Jun-12
24-Oct-12
20-Mar-13
9-Aug-13
2-Jan-14
28-May-14
17-Oct-14
16-Mar-15
6-Aug-15
28-Dec-15
23-May-16
13-Oct-16
9-Mar-17
1-Aug-17
21-Dec-17

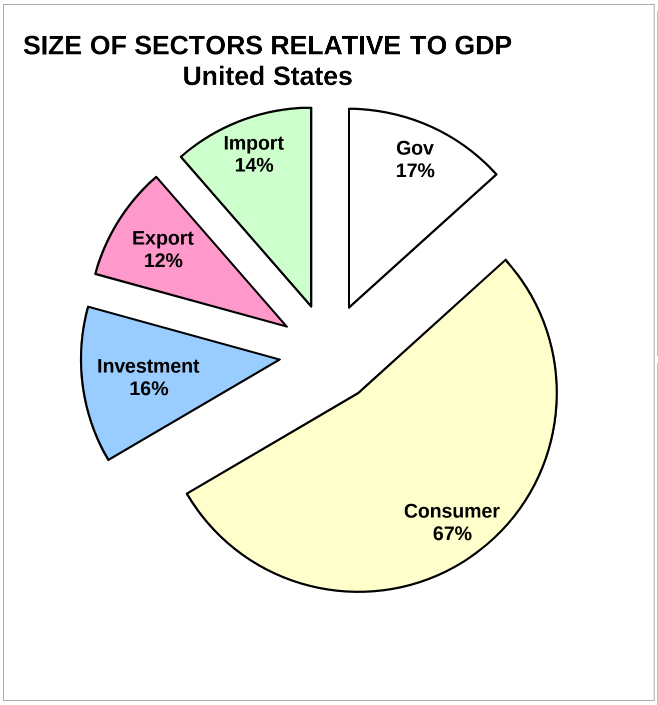

3%
2%
1%
0%
-1%
-2%
-3%
-4%
30-Jun-07
14-Nov-07
6-Apr-08
6-Aug-08
14-Dec-08
9-Apr-09
18-Aug-09
21-Nov-09
2-Mar-10
3-Jun-10
7-Sep-10
9-Dec-10
16-Mar-11
20-Jun-11
22-Sep-11
27-Dec-11
2-Apr-12
5-Jul-12
8-Oct-12
11-Jan-13
17-Apr-13
22-Jul-13
23-Oct-13
29-Jan-14
5-May-14
7-Aug-14
10-Nov-14
18-Feb-15
22-May-15
26-Aug-15
30-Nov-15
7-Mar-16
9-Jun-16
13-Sep-16
15-Dec-16
23-Mar-17
27-Jun-17
29-Sep-17

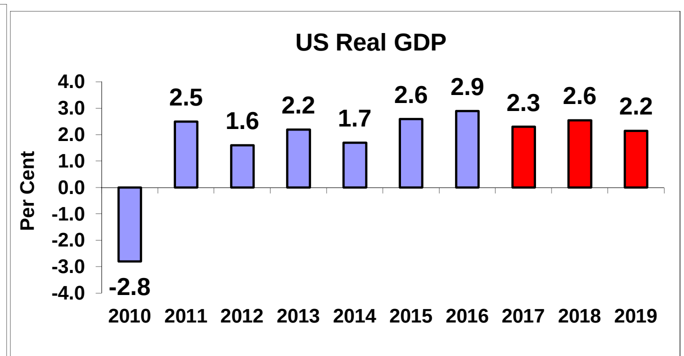
BASIC CAPITAL MARKET CONCEPTS

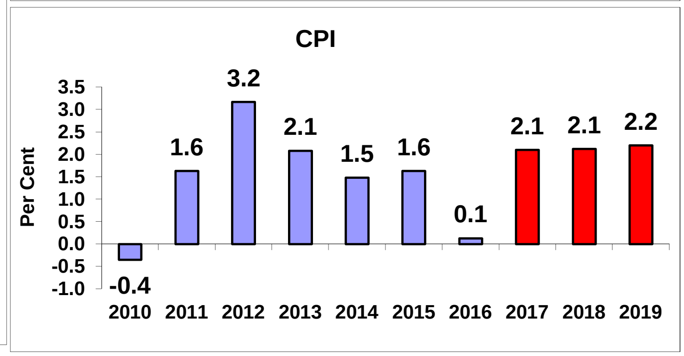
- EXPECTATIONS
  - Not Current Conditions
  - Example: Predictions of Current Bond Yields (Yield Curve), Relative P/E ratios
- RELATIVE VALUE
  - Not absolute value in itself
  - What are people willing to pay compared to other investment opportunities (comparing risk and returns)
  - Examples: Bond yield vs Earnings Yield (P/E), US Bond Yields vs International Yields
- PROFITS OR EARNINGS
  - Not general economy
  - Example: S&P 500 vs GDP, Source of Revenues

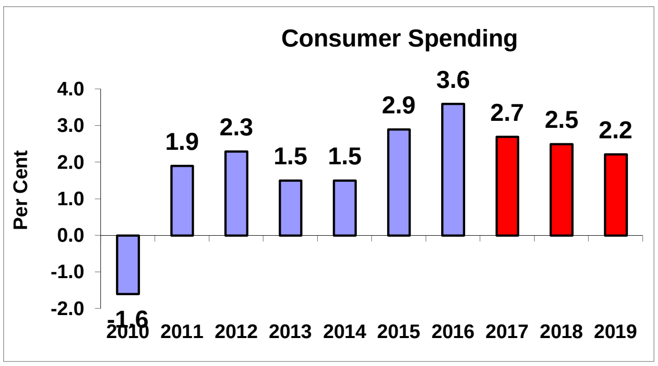


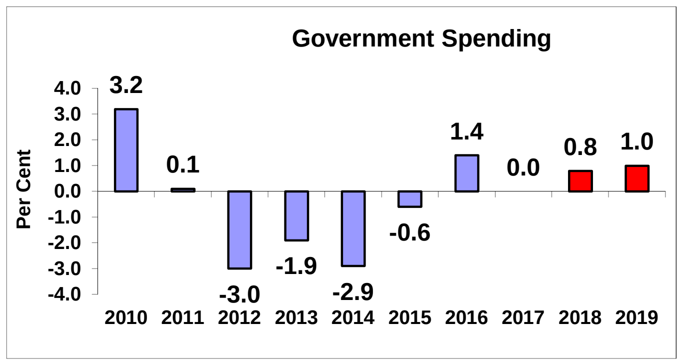


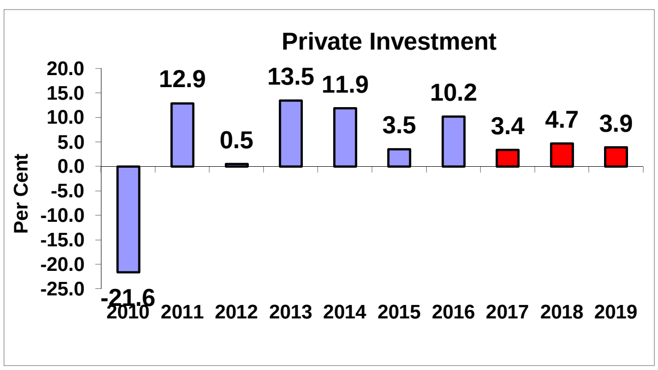

SIZE OF SECTORS RELATIVE TO GDP
United States
Import 14%
Gov 17%
Export 12%
Investment 16%
Consumer 67%

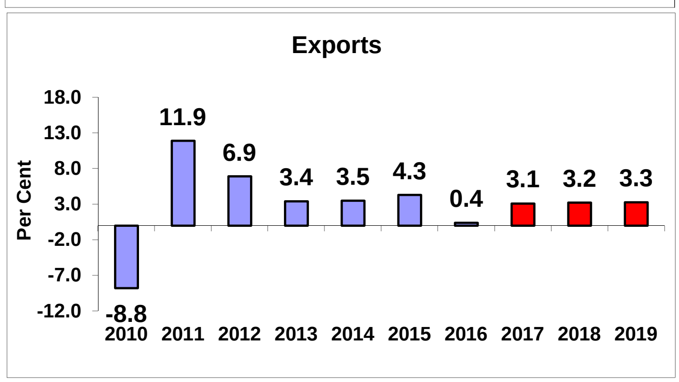

US Real GDP
Per Cent
2010 -2.8
2011 2.5
2012 1.6
2013 2.2
2014 1.7
2015 2.6
2016 2.9
2017 2.3
2018 2.6
2019 2.2

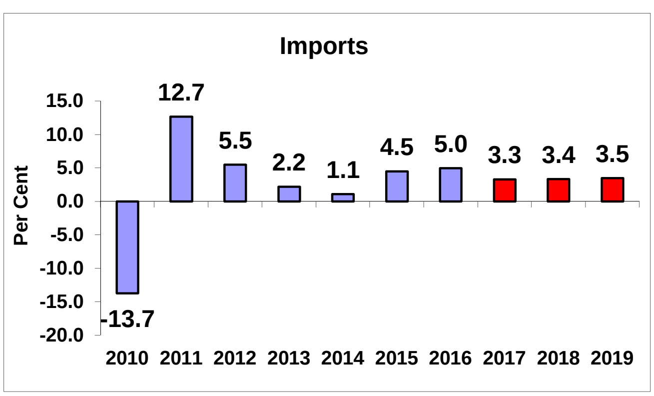

CPI
Per Cent
2010 -0.4
2011 1.6
2012 3.2
2013 2.1
2014 1.5
2015 1.6
2016 0.1
2017 2.1
2018 2.1
2019 2.2

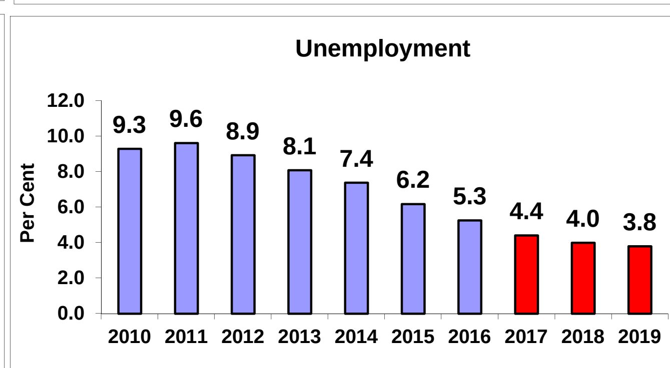

Consumer Spending
Per Cent
2010 -1.6
2011 1.9
2012 2.3
2013 1.5
2014 1.5
2015 2.9
2016 3.6
2017 2.7
2018 2.5
2019 2.2

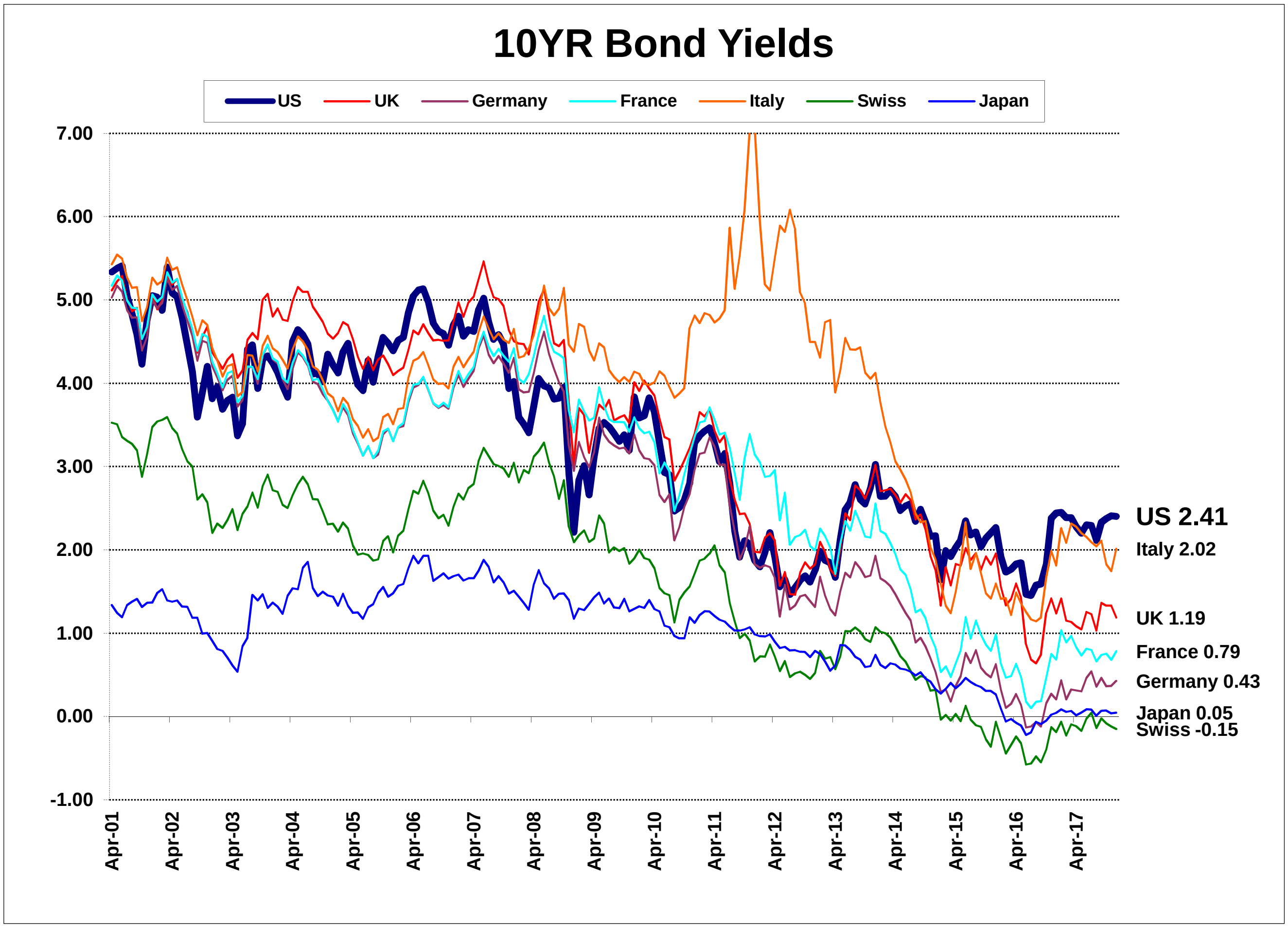

Government Spending
Per Cent
2010 3.2
2011 0.1
2012 -3.0
2013 -1.9
2014 -2.9
2015 -0.6
2016 1.4
2017 0.0
2018 0.8
2019 1.0

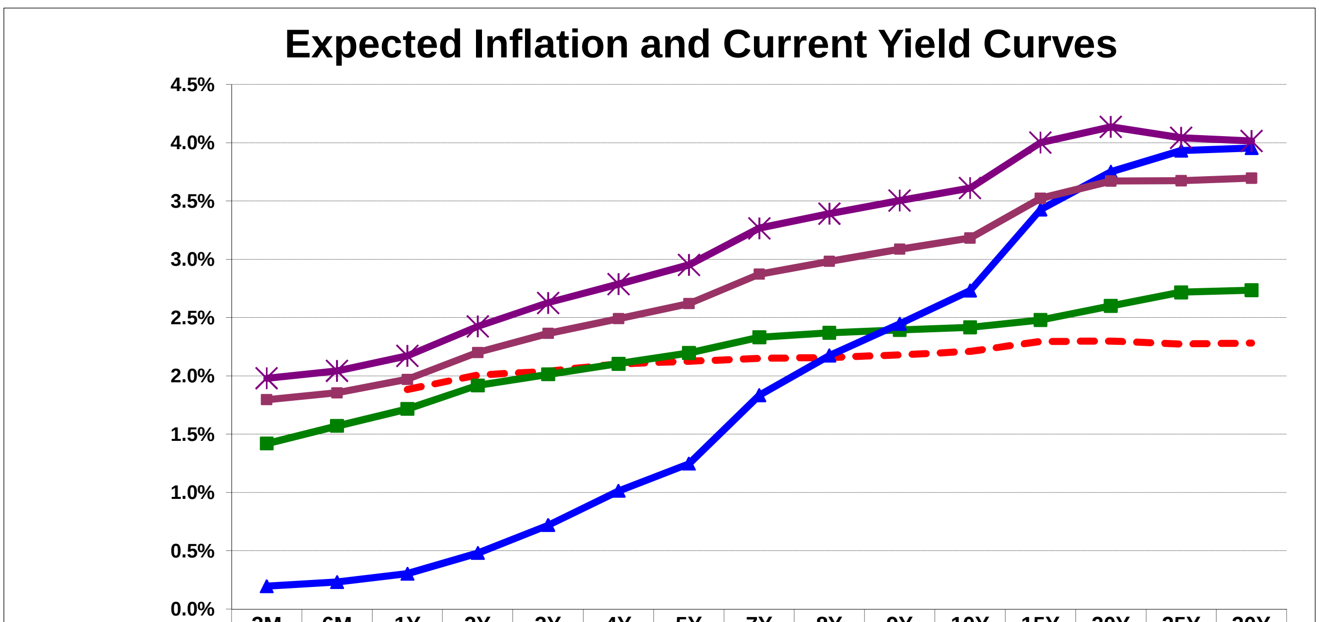

Private Investment
Per Cent
2010 -21.6
2011 12.9
2012 0.5
2013 13.5
2014 11.9
2015 3.5
2016 10.2
2017 3.4
2018 4.7
2019 3.9


Exports
Per Cent
2010 -8.8
2011 11.9
2012 6.9
2013 3.4
2014 3.5
2015 4.3
2016 0.4
2017 3.1
2018 3.2
2019 3.3


Imports
Per Cent
2010 -13.7
2011 12.7
2012 5.5
2013 2.2
2014 1.1
2015 4.5
2016 5.0
2017 3.3
2018 3.4
2019 3.5

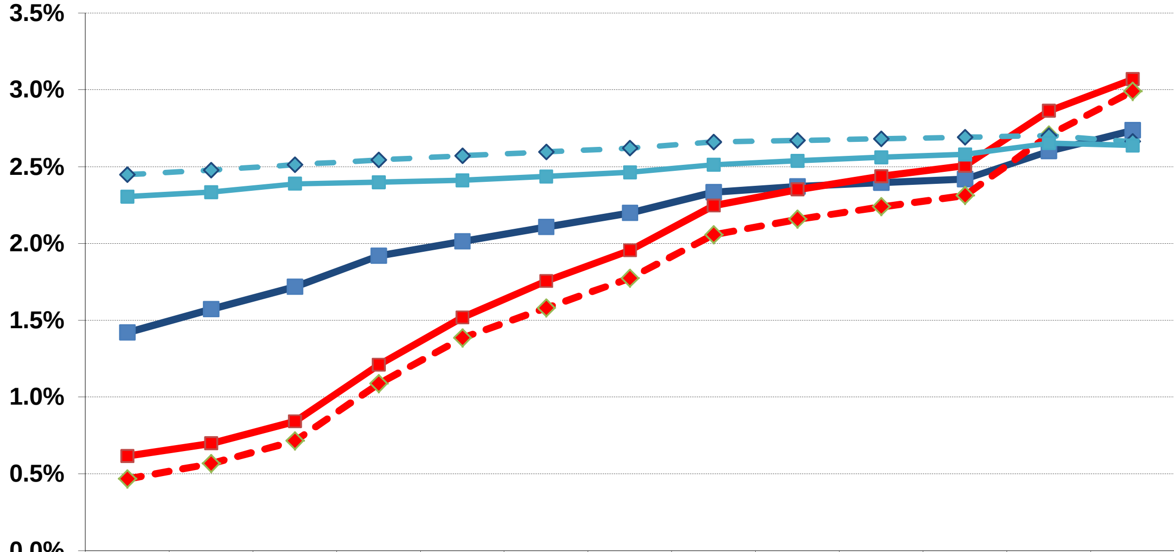

Unemployment
Per Cent
2010 9.3
2011 9.6
2012 8.9
2013 8.1
2014 7.4
2015 6.2
2016 5.3
2017 4.4
2018 4.0
2019 3.8





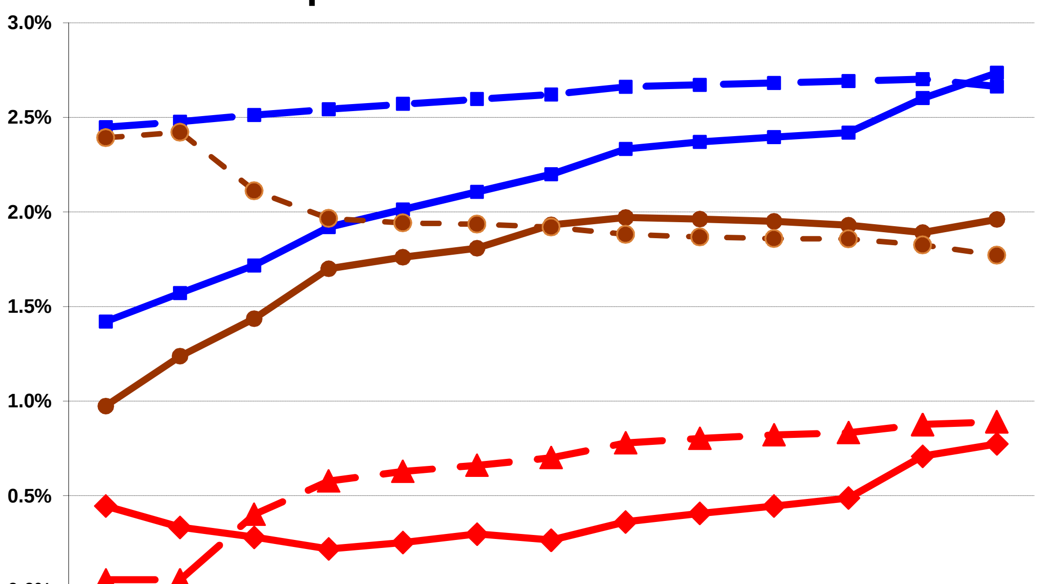
	3M	6M	1Y	2Y	3Y	4Y	5Y	7Y	8Y	9Y	10Y	15Y	20Y	25Y	30Y
Inflation			1.9%	2.0%	2.0%	2.1%	2.1%	2.2%	2.2%	2.2%	2.2%	2.3%	2.3%	2.3%	2.3%
Treasury	1.4%	1.6%	1.7%	1.9%	2.0%	2.1%	2.2%	2.3%	2.4%	2.4%	2.4%	2.5%	2.6%	2.7%	2.7%
AAA	0.2%	0.2%	0.3%	0.5%	0.7%	1.0%	1.2%	1.8%	2.2%	2.4%	2.7%	3.4%	3.8%	3.9%	4.0%
A	1.8%	1.9%	2.0%	2.2%	2.4%	2.5%	2.6%	2.9%	3.0%	3.1%	3.2%	3.5%	3.7%	3.7%	3.7%
BBB	2.0%	2.0%	2.2%	2.4%	2.6%	2.8%	3.0%	3.3%	3.4%	3.5%	3.6%	4.0%	4.1%	4.0%	4.0%

Past, Current, and Predicted Treasury Yield Curves



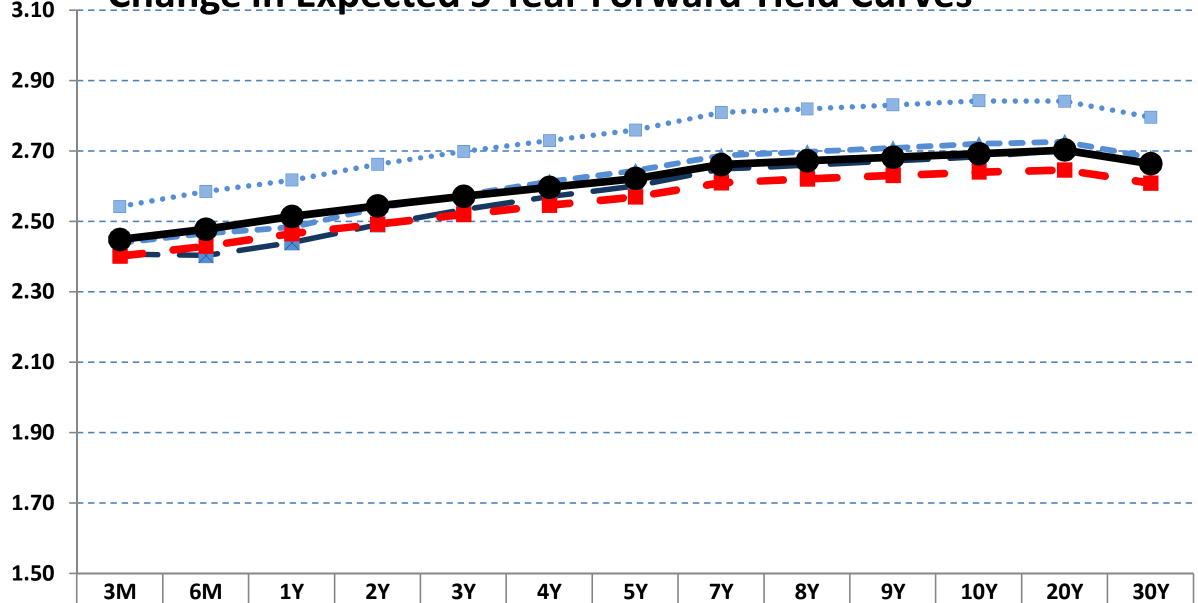
	3M	6M	1Y	2Y	3Y	4Y	5Y	7Y	8Y	9Y	10Y	20Y	30Y
Current	1.4%	1.6%	1.7%	1.9%	2.0%	2.1%	2.2%	2.3%	2.4%	2.4%	2.4%	2.6%	2.7%
- 1YR	0.6%	0.7%	0.8%	1.2%	1.5%	1.8%	2.0%	2.2%	2.4%	2.4%	2.5%	2.9%	3.1%
-2 YR	0.5%	0.6%	0.7%	1.1%	1.4%	1.6%	1.8%	2.1%	2.2%	2.2%	2.3%	2.7%	3.0%
+ 5YR	2.4%	2.5%	2.5%	2.5%	2.6%	2.6%	2.6%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
+2YR	2.3%	2.3%	2.4%	2.4%	2.4%	2.4%	2.5%	2.5%	2.5%	2.6%	2.6%	2.7%	2.6%

Current and Expected Yield Curves in 5 Yrs



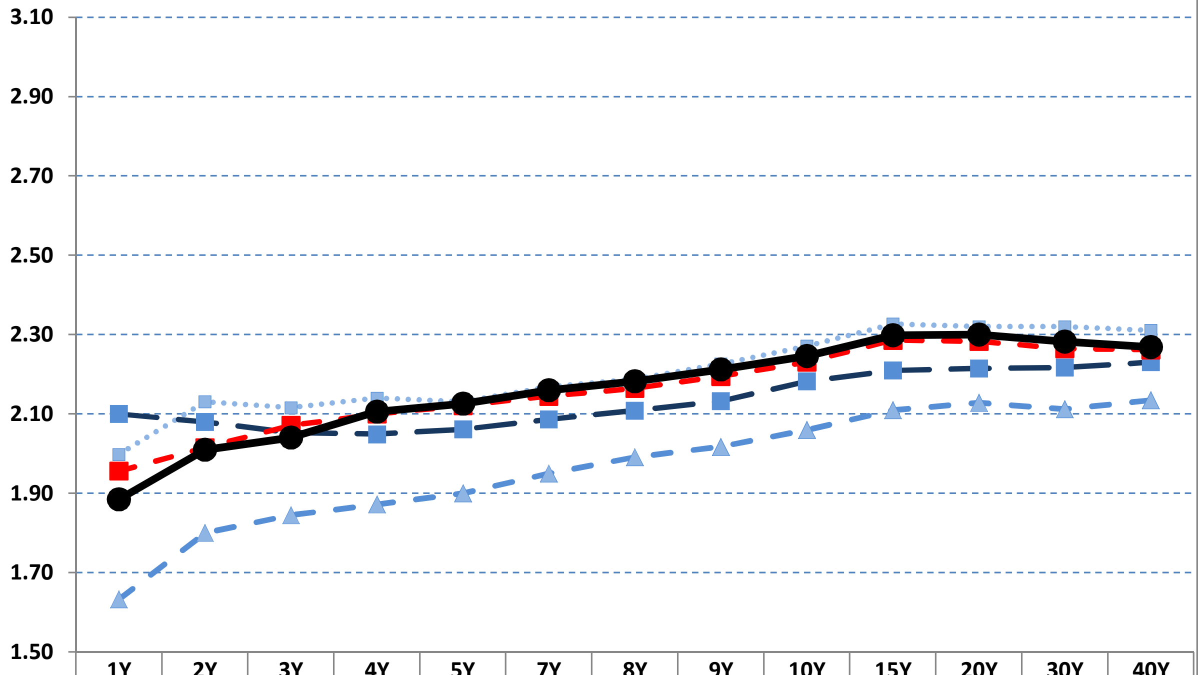
	3M	6M	1Y	2Y	3Y	4Y	5Y	7Y	8Y	9Y	10Y	20Y	30Y
Current TIPS	0.4%	0.3%	0.3%	0.2%	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.5%	0.7%	0.8%
Current Treasury	1.4%	1.6%	1.7%	1.9%	2.0%	2.1%	2.2%	2.3%	2.4%	2.4%	2.4%	2.6%	2.7%
TIPS in 5	0.1%	0.1%	0.4%	0.6%	0.6%	0.7%	0.7%	0.8%	0.8%	0.8%	0.8%	0.9%	0.9%
Treasury in 5	2.4%	2.5%	2.5%	2.5%	2.6%	2.6%	2.6%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Current Breakever	1.0%	1.2%	1.4%	1.7%	1.8%	1.8%	1.9%	2.0%	2.0%	2.0%	1.9%	1.9%	2.0%
Breakeven in 5	2.4%	2.4%	2.1%	2.0%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.8%	1.8%

Change in Expected 5 Year Forward Yield Curves

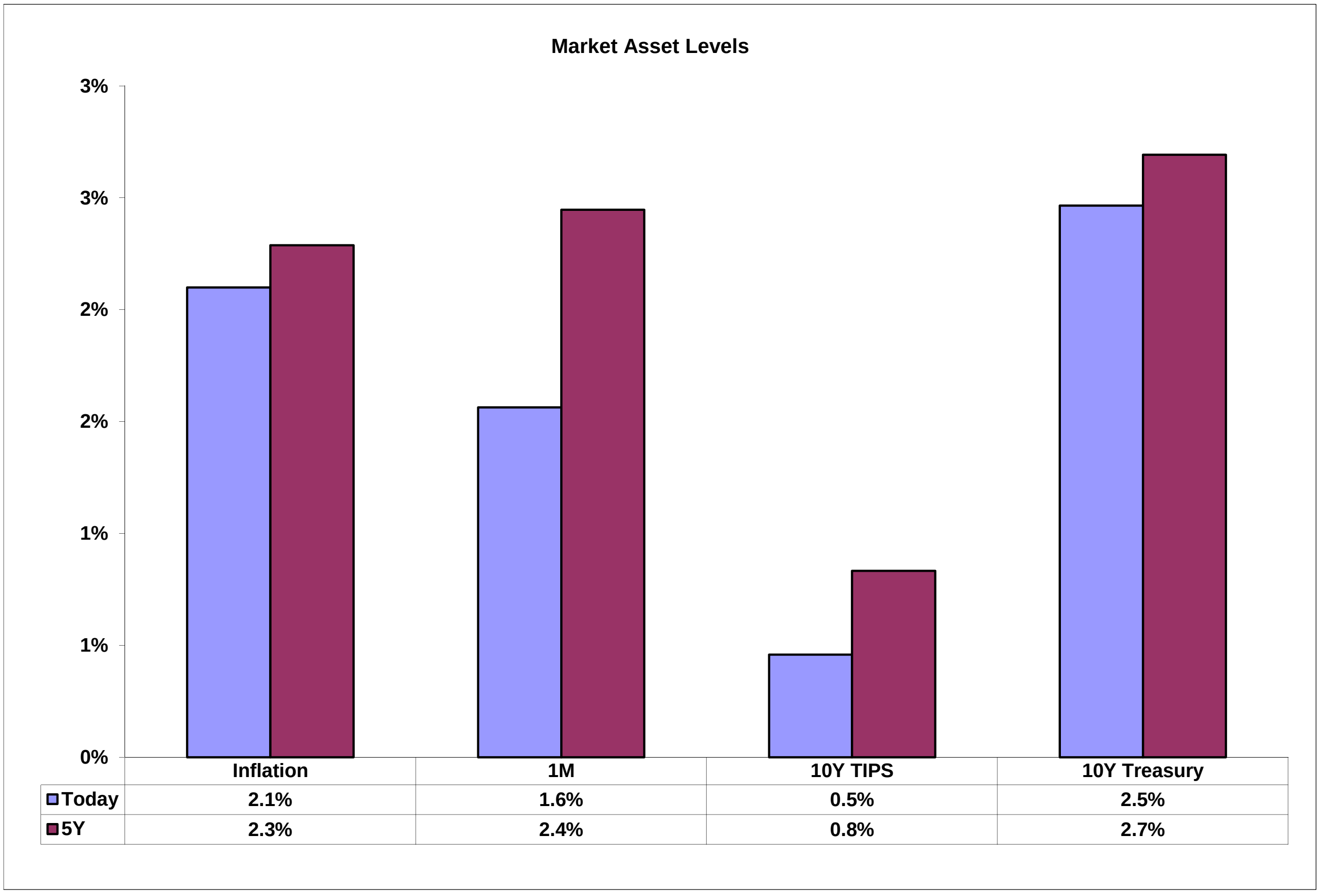


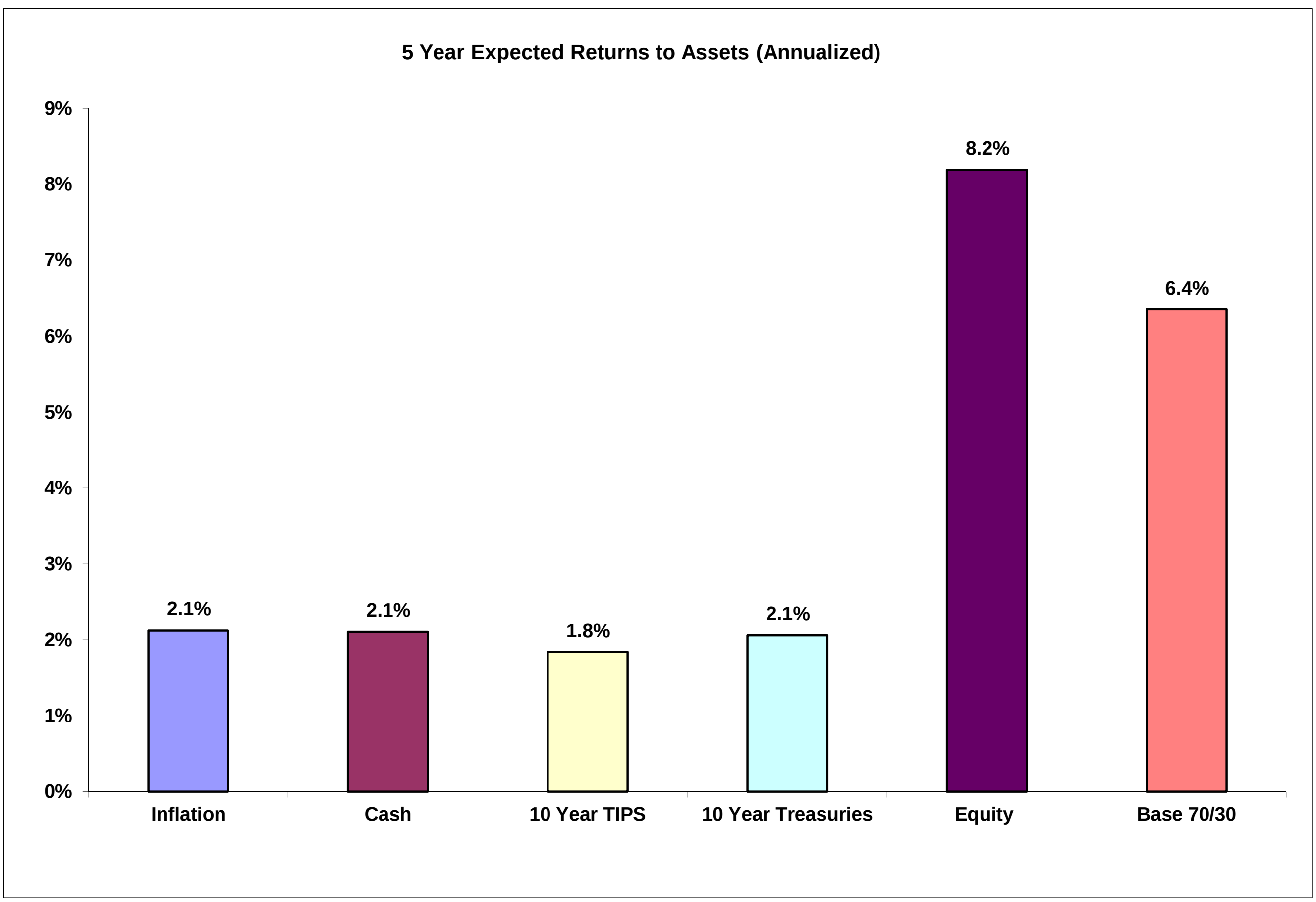
	3M	6M	1Y	2Y	3Y	4Y	5Y	7Y	8Y	9Y	10Y	20Y	30Y
Mar-17	2.54	2.59	2.62	2.66	2.70	2.73	2.76	2.81	2.82	2.83	2.84	2.84	2.80
Jun-17	2.44	2.47	2.48	2.54	2.58	2.61	2.64	2.69	2.70	2.71	2.72	2.73	2.68
Sep-17	2.41	2.40	2.44	2.49	2.53	2.57	2.60	2.65	2.66	2.67	2.68	2.70	2.66
Dec-17	2.40	2.43	2.47	2.49	2.52	2.55	2.57	2.61	2.62	2.63	2.64	2.65	2.61
Jan-18	2.45	2.48	2.51	2.54	2.57	2.60	2.62	2.66	2.67	2.68	2.69	2.70	2.66

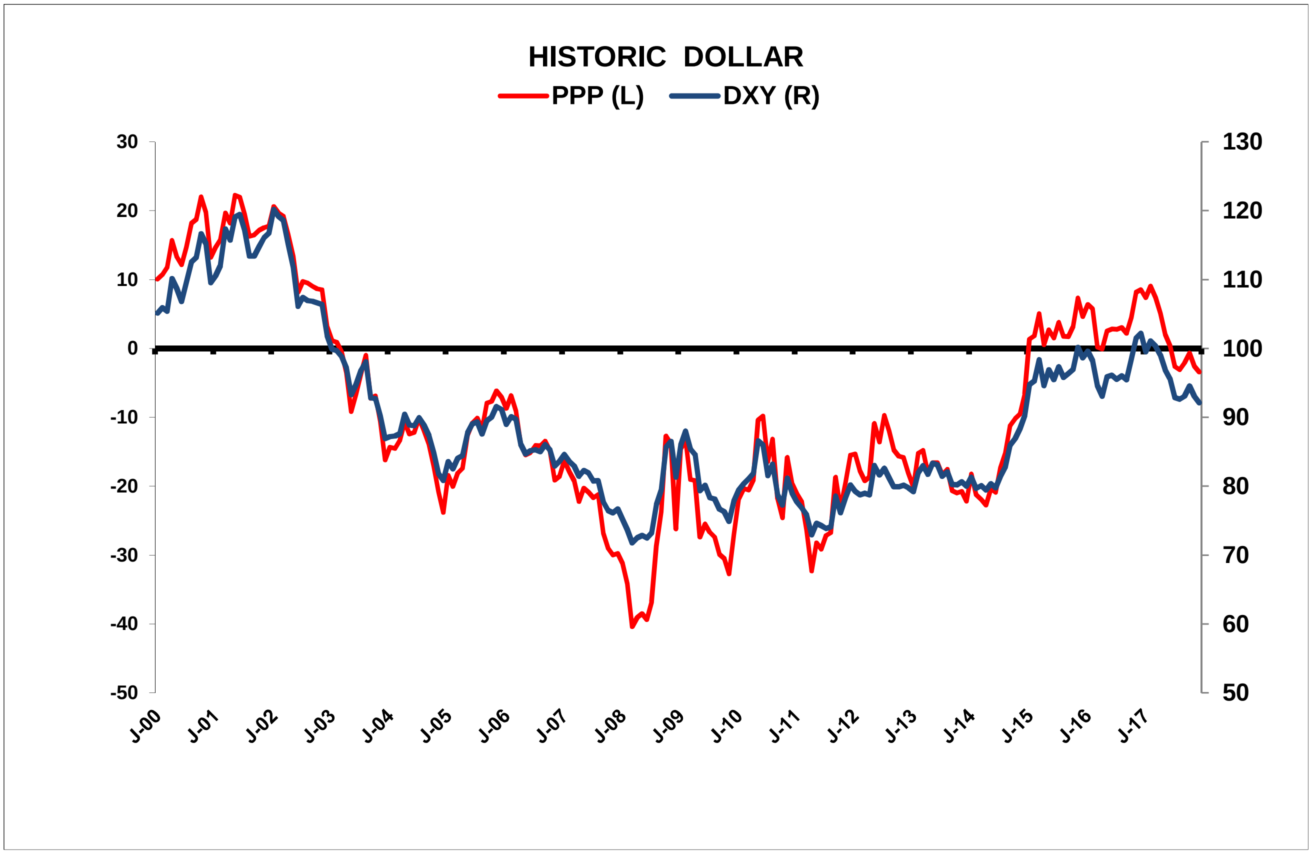
Change in Expected Inflation



	1Y	2Y	3Y	4Y	5Y	7Y	8Y	9Y	10Y	15Y	20Y	30Y	40Y
Mar-17	2.00	2.13	2.12	2.14	2.13	2.17	2.19	2.23	2.27	2.33	2.32	2.32	2.31
Jun-17	1.63	1.80	1.85	1.87	1.90	1.95	1.99	2.02	2.06	2.11	2.13	2.11	2.14
Sep-17	2.10	2.08	2.05	2.05	2.06	2.09	2.11	2.13	2.18	2.21	2.21	2.22	2.23
Dec-17	1.96	2.02	2.07	2.10	2.12	2.14	2.17	2.20	2.23	2.29	2.28	2.26	2.26
Jan-18	1.89	2.01	2.04	2.11	2.13	2.16	2.18	2.21	2.25	2.30	2.30	2.28	2.27


Market Asset Levels
3%
3%
2%
2%
1%
1%
0%
Inflation
1M
10Y TIPS
10Y Treasury
Today
2.1%
1.6%
0.5%
2.5%
5Y
2.3%
2.4%
0.8%
2.7%


5 Year Expected Returns to Assets (Annualized)
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
2.1%
2.1%
1.8%
2.1%
8.2%
6.4%
Inflation
Cash
10 Year TIPS
10 Year Treasuries
Equity
Base 70/30


HISTORIC DOLLAR
PPP (L)
DXY (R)
30
20
10
0
-10
-20
-30
-40
-50
130
120
110
100
90
80
70
60
50
J-00
J-01
J-02
J-03
J-04
J-05
J-06
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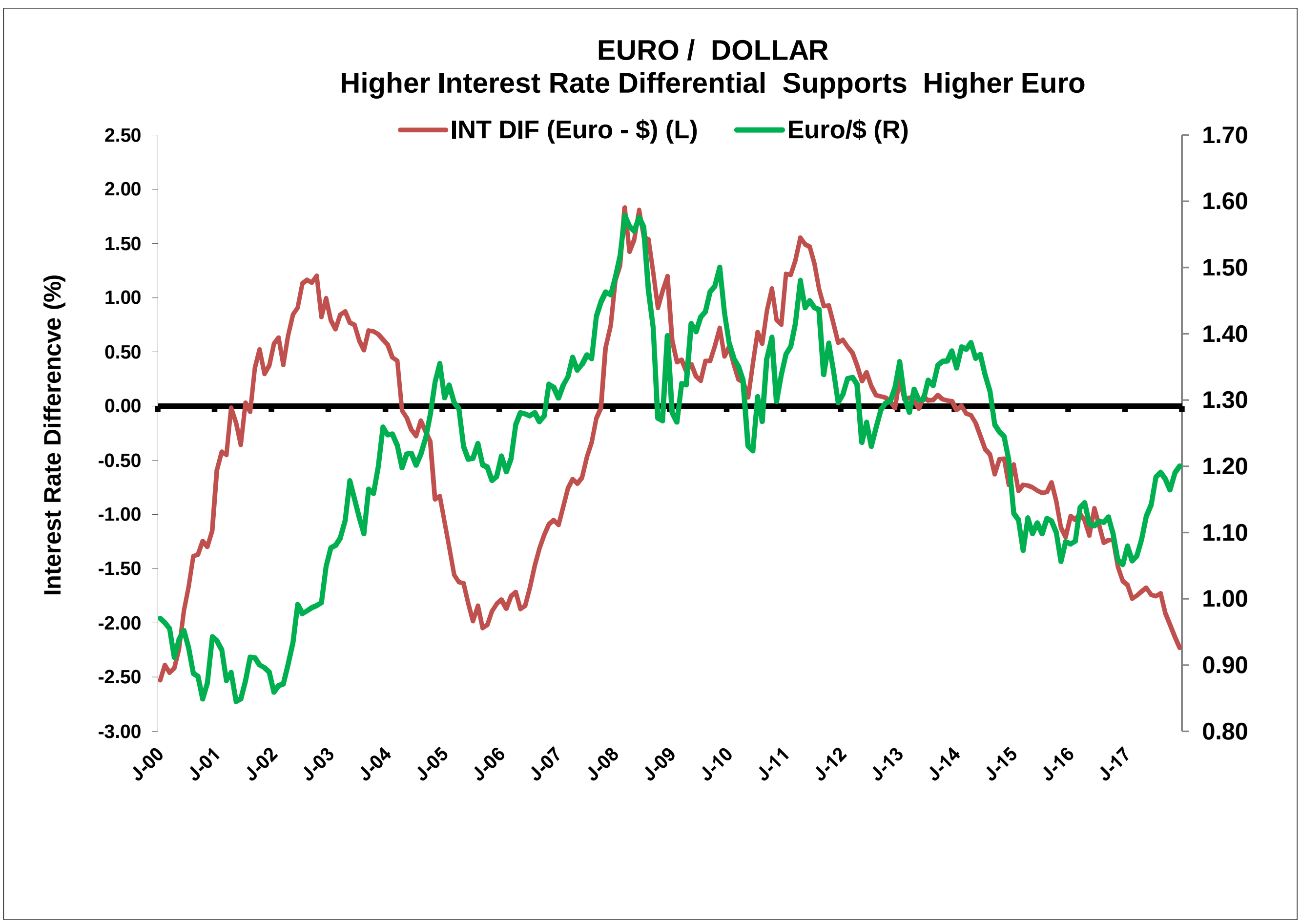
J-15
J-16
J-17


EURO / DOLLAR
Higher Interest Rate Differential Supports Higher Euro
INT DIF (Euro - $) (L)
Euro/$ (R)
Interest Rate Differencve (%)
2.50
2.00
1.50
1.00
0.50
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
J-00
J-01
J-02
J-03
J-04
J-05
J-06
J-07
J-08
J-09
J-10
J-11
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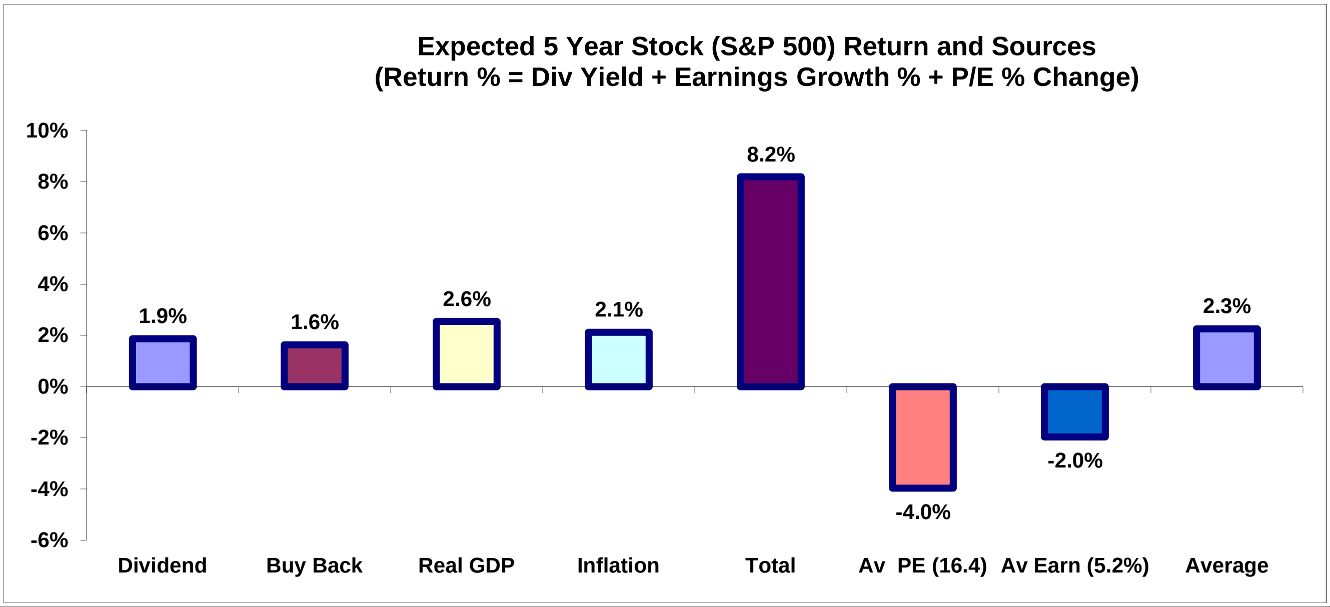
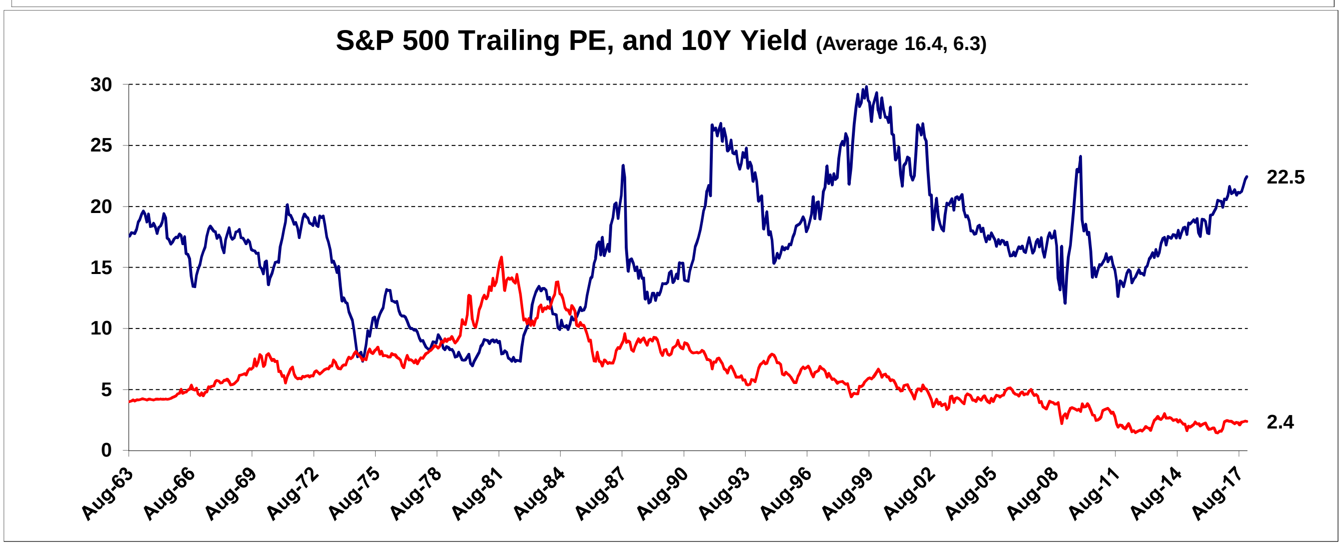
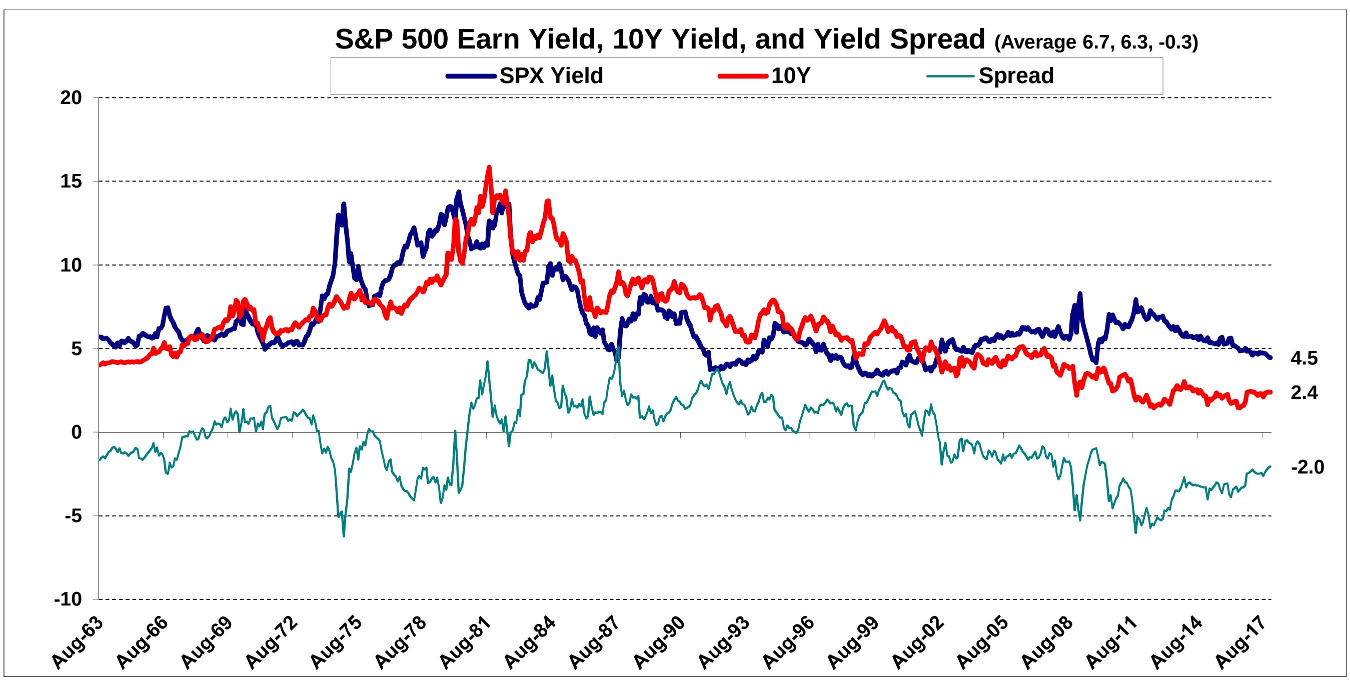
J-14
J-15
J-16
J-17



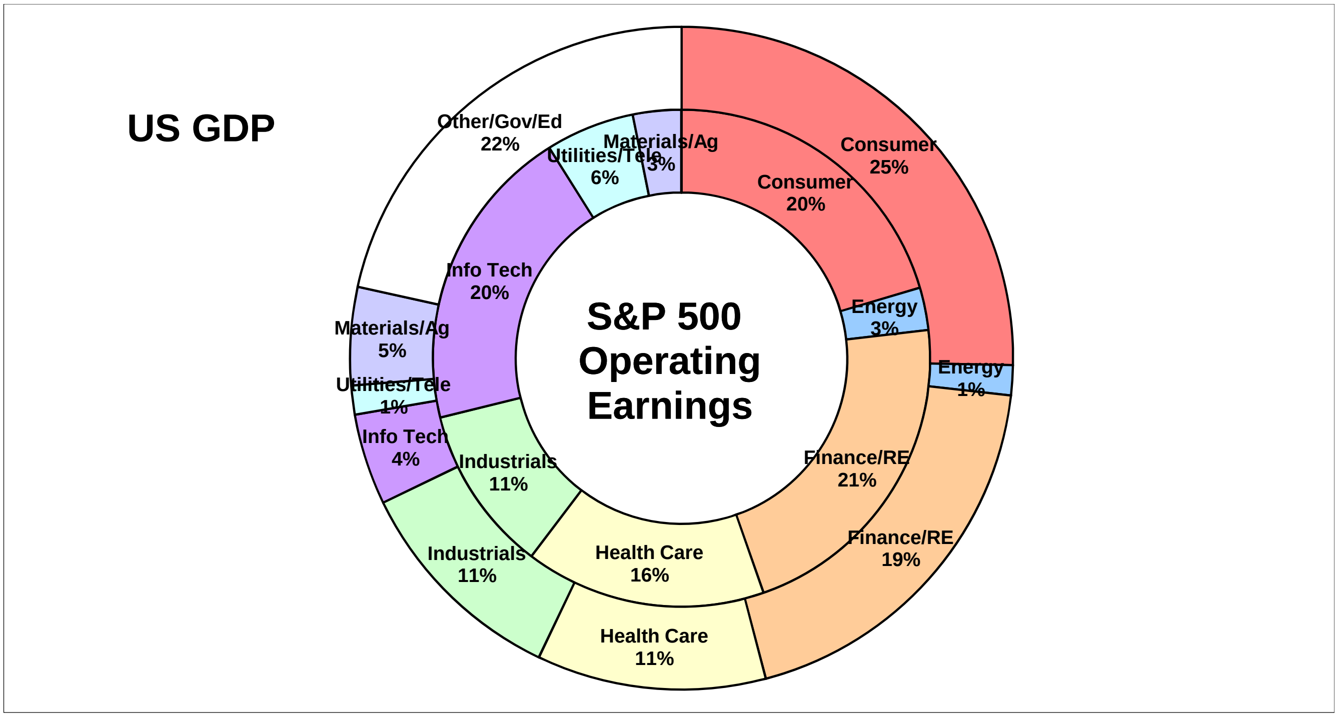
Expected 5 Year Stock (S&P 500) Return and Sources
(Return % = Div Yield + Earnings Growth % + P/E % Change)
10%
8%
6%
4%
2%
0%
-2%
-4%
-6%
1.9%
1.6%
2.6%
2.1%
8.2%
-4.0%
-2.0%
2.3%
Dividend
Buy Back
Real GDP
Inflation
Total
Av PE (16.4)
Av Earn (5.2%)
Average

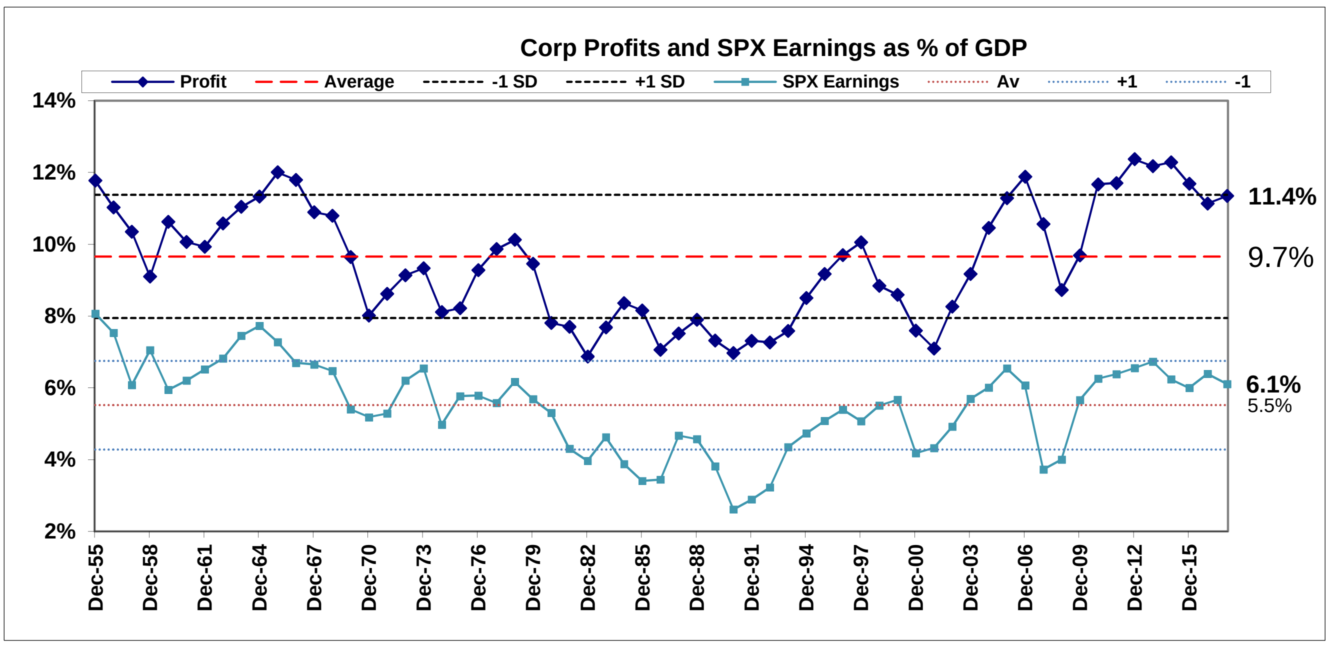


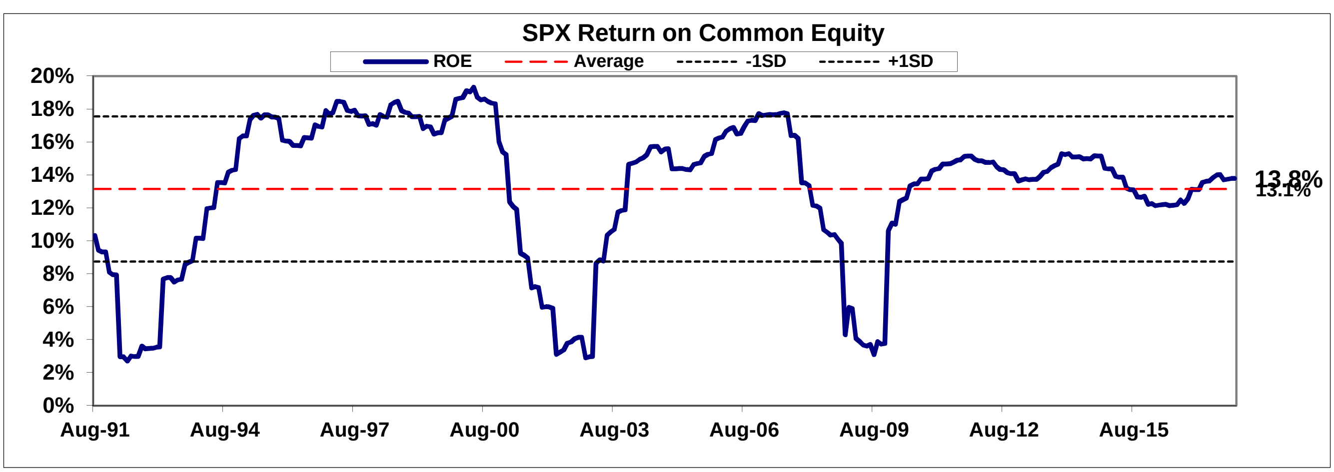
S&P 500 Trailing PE, and 10Y Yield (Average 16.4, 6.3)
30
25
20
15
10
5
0
22.5
2.4
Aug-63
Aug-66
Aug-69
Aug-72
Aug-75
Aug-78
Aug-81
Aug-84
Aug-87
Aug-90
Aug-93
Aug-96
Aug-99
Aug-02
Aug-05
Aug-08
Aug-11
Aug-14
Aug-17

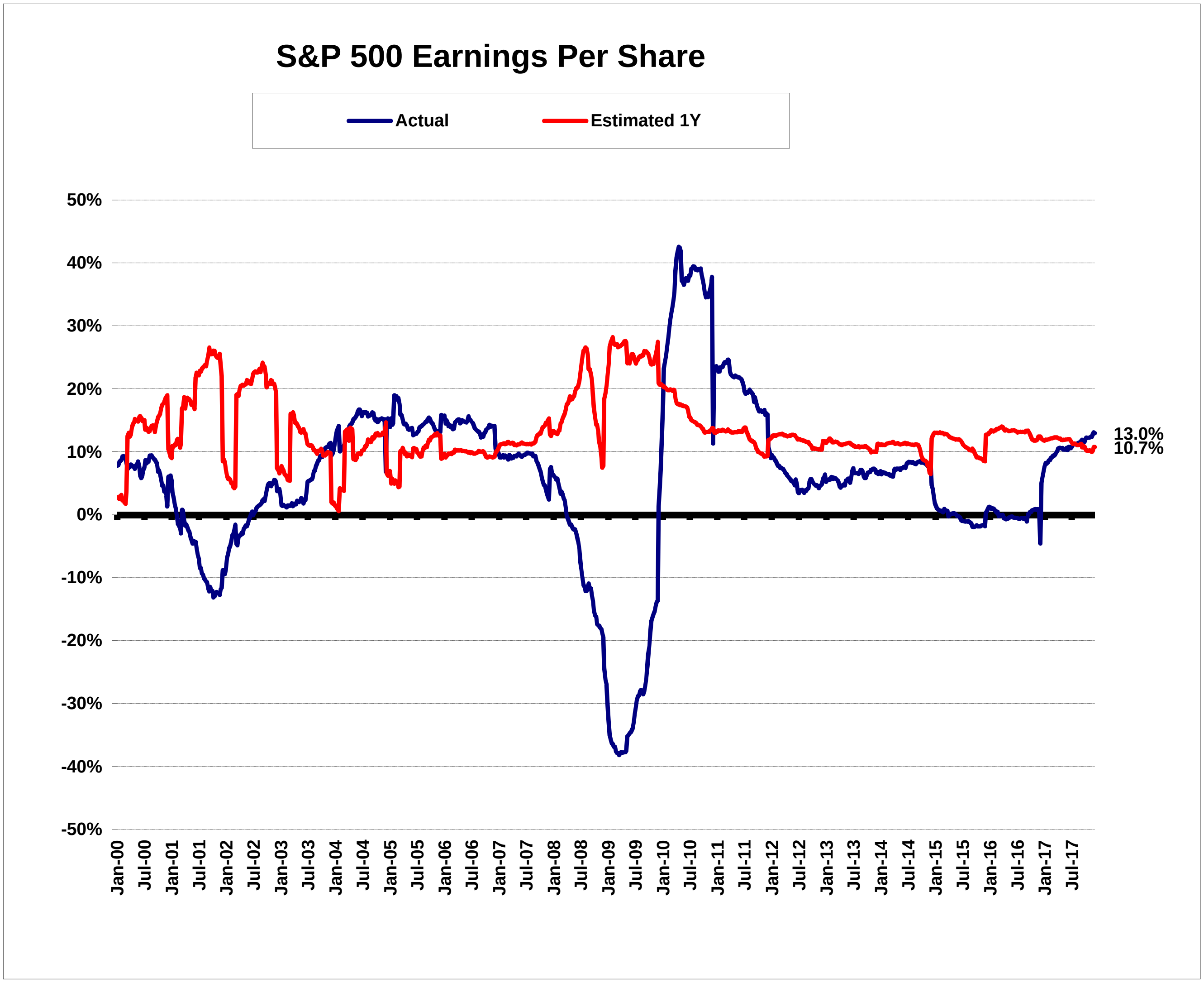


S&P 500 Earn Yield, 10Y Yield, and Yield Spread (Average 6.7, 6.3, -0.3)
SPX Yield
10Y
Spread
20
15
10
5
0
-5
-10
4.5
2.4
-2.0
Aug-63
Aug-66
Aug-69
Aug-72
Aug-75
Aug-78
Aug-81
Aug-84
Aug-87
Aug-90
Aug-93
Aug-96
Aug-99
Aug-02
Aug-05
Aug-08
Aug-11
Aug-14
Aug-17

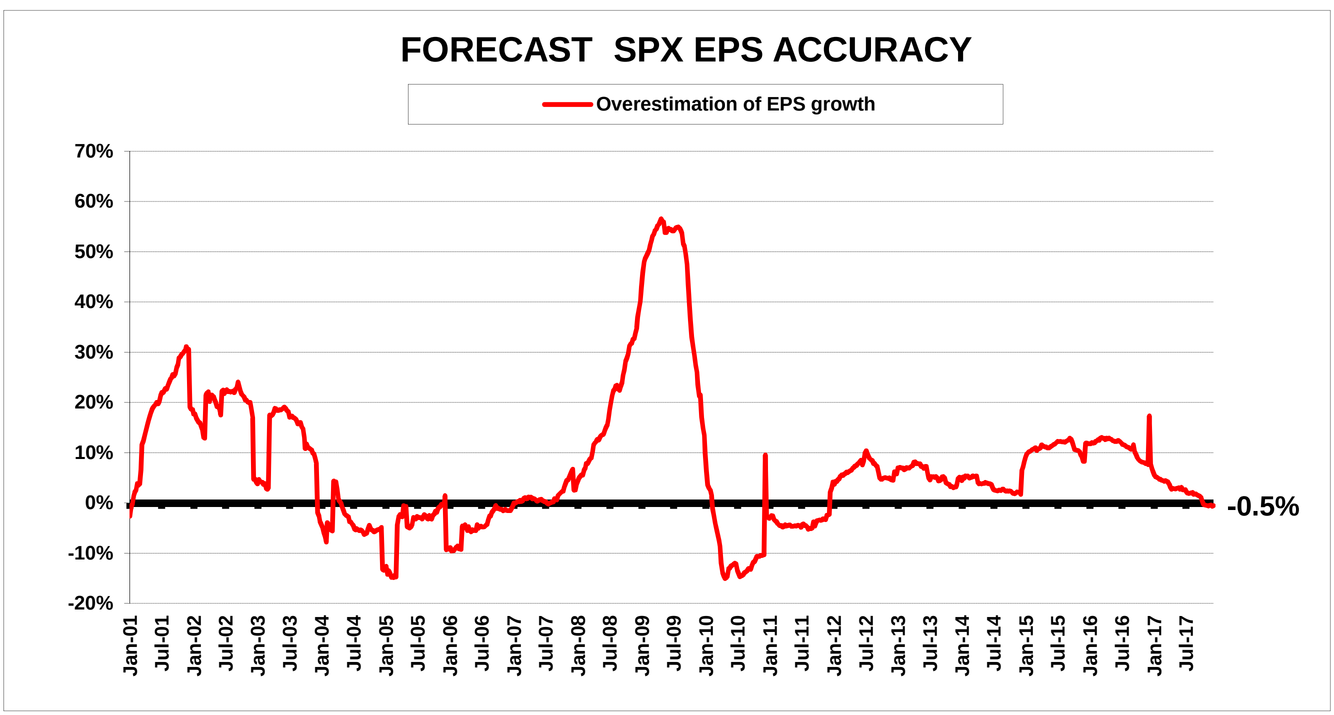

US GDP
S&P 500
Operating
Earnings
Other/Gov/Ed
22%
Materials/Ag
3%
Utilities/Tele
6%
Consumer
25%
Consumer
20%
Info Tech
20%
Energy
3%
Energy
1%
Materials/Ag
5%
Utilities/Tele
1%
Info Tech
4%
Industrials
11%
Finance/RE
21%
Finance/RE
19%
Health Care
16%
Industrials
11%
Health Care
11%


Corp Profits and SPX Earnings as % of GDP
Profit
Average
-1 SD
+1 SD
SPX Earnings
Av
+1
-1
14%
12%
10%
8%
6%
4%
2%
11.4%
9.7%
6.1%
5.5%
Dec-55
Dec-58
Dec-61
Dec-64
Dec-67
Dec-70
Dec-73
Dec-76
Dec-79
Dec-82
Dec-85
Dec-88
Dec-91
Dec-94
Dec-97
Dec-00
Dec-03
Dec-06
Dec-09
Dec-12
Dec-15

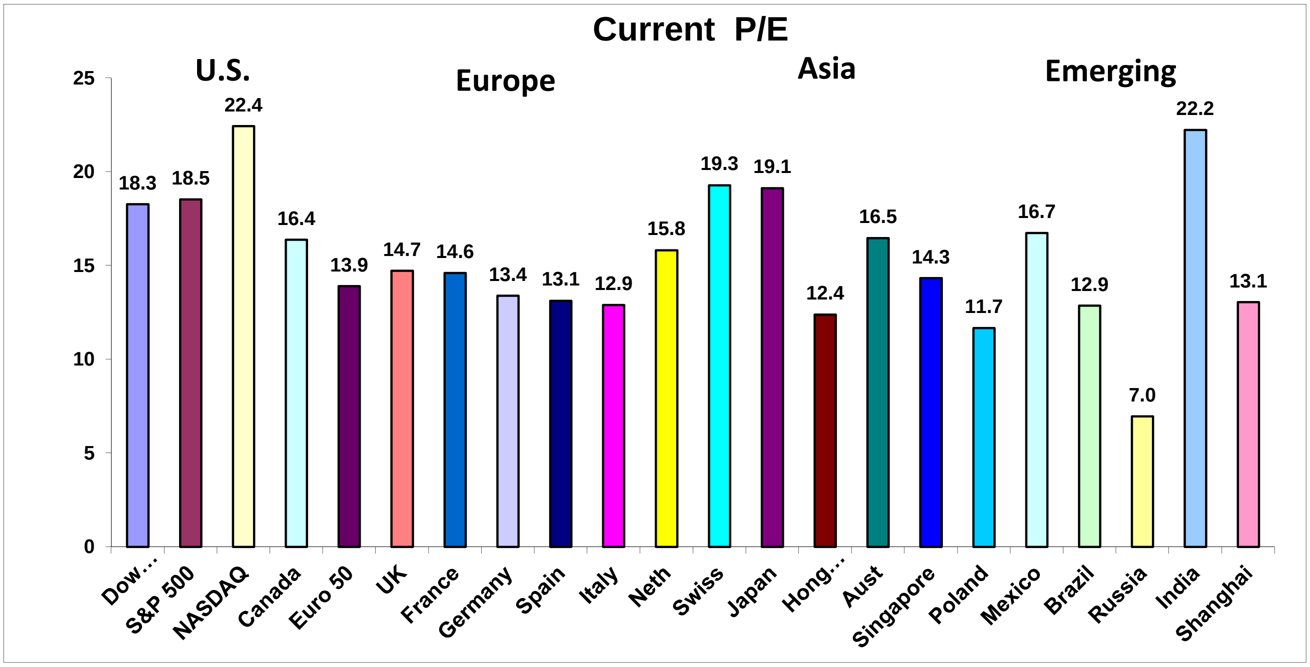

SPX Return on Common Equity
ROE
Average
-1SD
+1SD
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
13.8%
13.1%
Aug-91
Aug-94
Aug-97
Aug-00
Aug-03
Aug-06
Aug-09
Aug-12
Aug-15



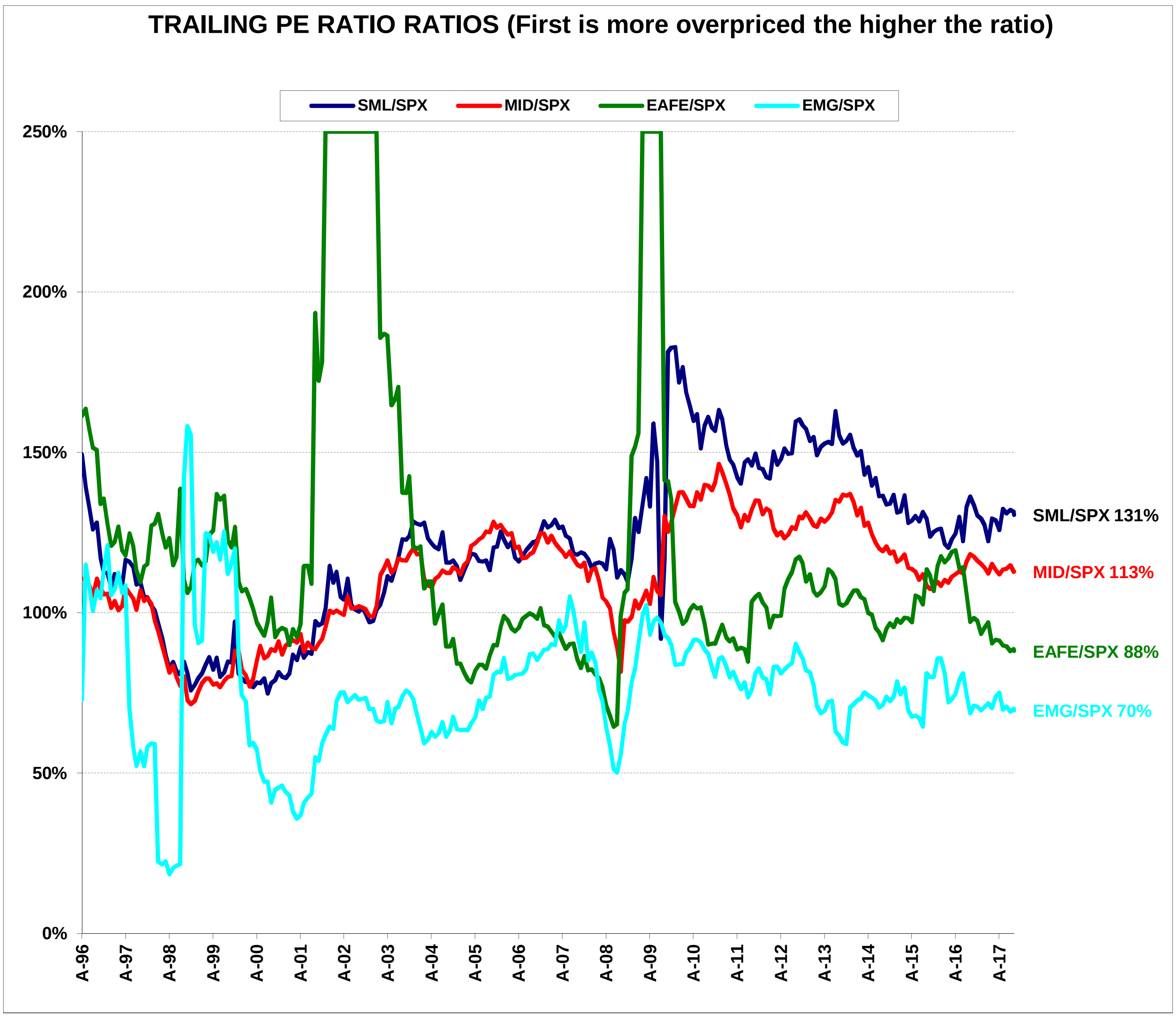
S&P 500 Earnings Per Share
Actual
Estimated 1Y
50%
40%
30%
20%
10%
0%
-10%
-20%
-30%
-40%
-50%
13.0%
10.7%
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17



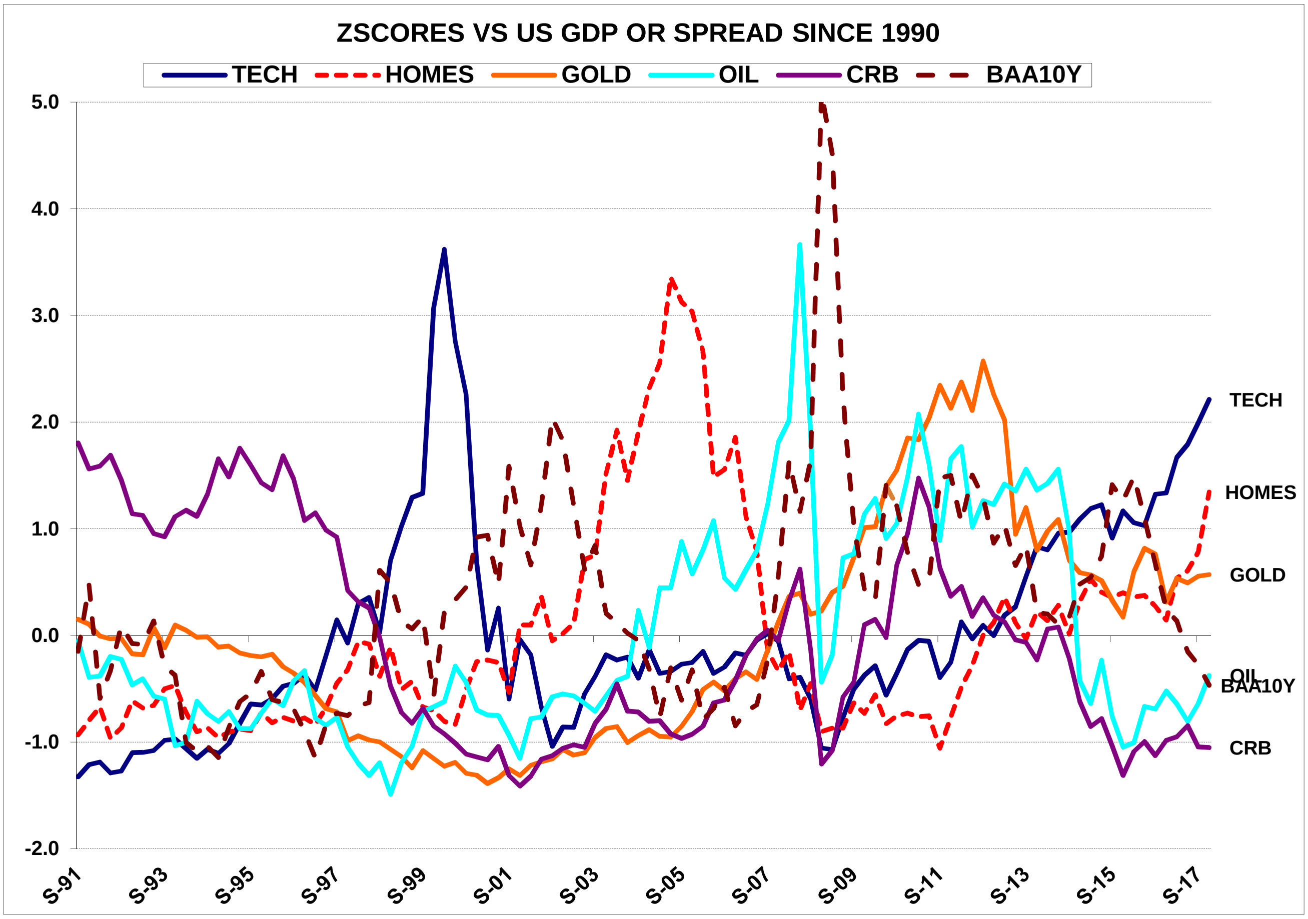
FORECAST SPX EPS ACCURACY
Overestimation of EPS growth
70%
60%
50%
40%
30%
20%
10%
0%
-10%
-20%
-0.5%
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17

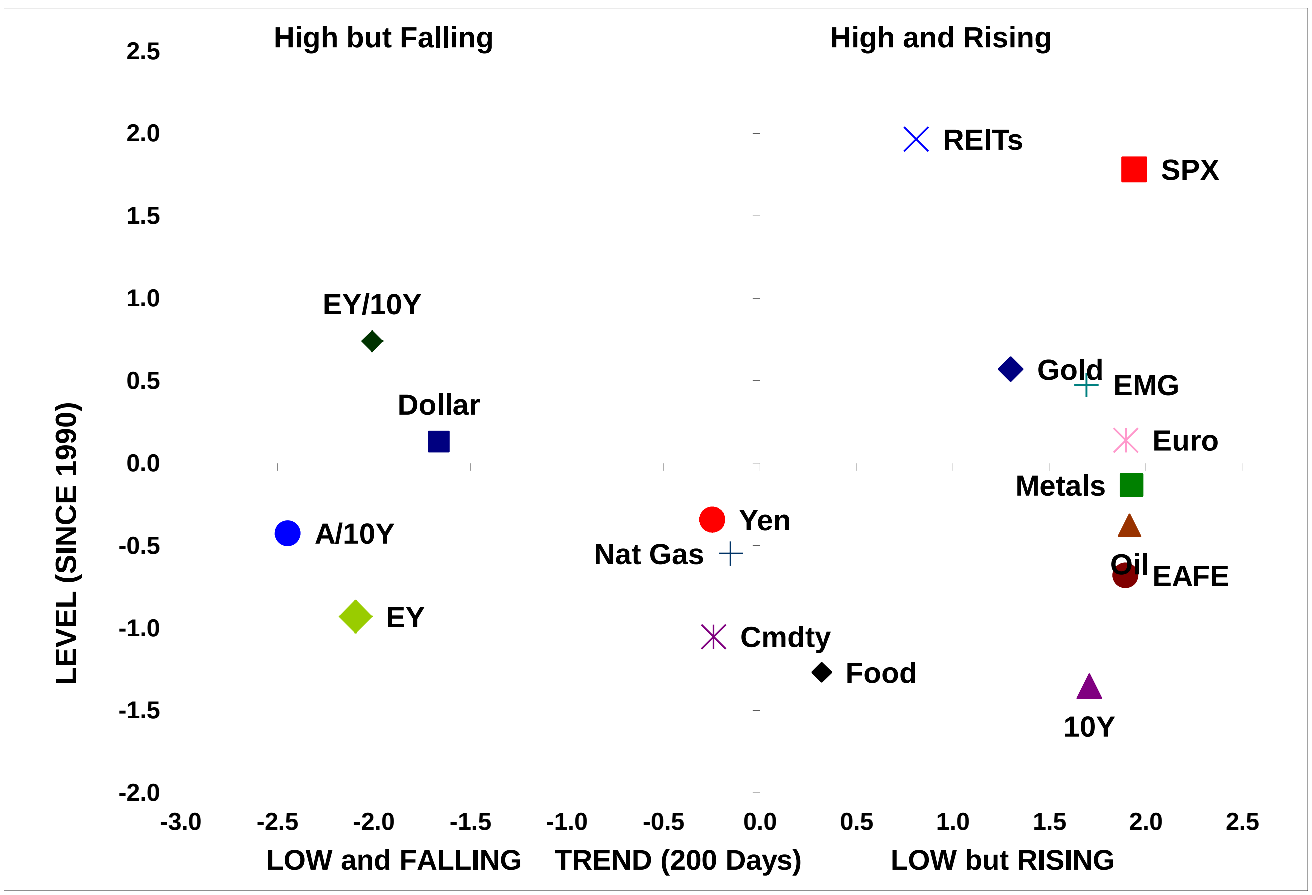


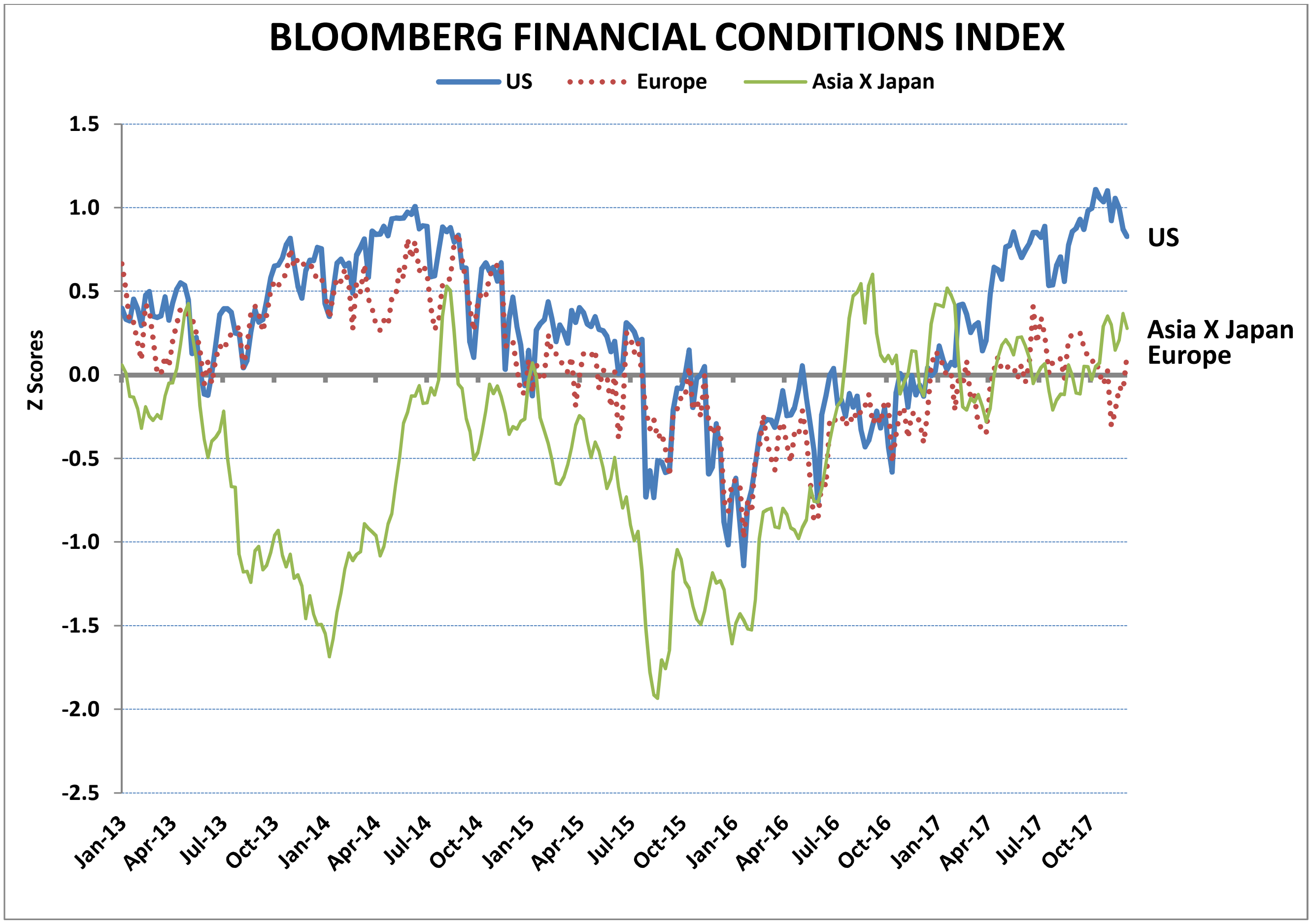
Current P/E
U.S.
Europe
Asia
Emerging
25
20
15
10
5
0
18.3
18.5
22.4
16.4
13.9
14.7
14.6
13.4
13.1
12.9
15.8
19.3
19.1
12.4
16.5
14.3
11.7
16.7
12.9
7.0
22.2
13.1
Dow…
S&P 500
NASDAQ
Canada
Euro 50
UK
France
Germany
Spain
Italy
Neth
Swiss
Japan
Hong…
Aust
Singapore
Poland
Mexico
Brazil
Russia
India
Shanghai



TRAILING PE RATIO RATIOS (First is more overpriced the higher the ratio)
SML/SPX
MID/SPX
EAFE/SPX
EMG/SPX
250%
200%
150%
100%
50%
0%
SML/SPX 131%
MID/SPX 113%
EAFE/SPX 88%
EMG/SPX 70%
A-96
A-97
A-98
A-99
A-00
A-01
A-02
A-03
A-04
A-05
A-06
A-07
A-08
A-09
A-10
A-11
A-12
A-13
A-14
A-15
A-16
A-17


ZSCORES VS US GDP OR SPREAD SINCE 1990
TECH
HOMES
GOLD
OIL
CRB
BAA10Y
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
S-91
S-93
S-95
S-97
S-99
S-01
S-03
S-05
S-07
S-09
S-11
S-13
S-15
S-17
TECH
HOMES
GOLD
OIL
BAA10Y
CRB


High but Falling
High and Rising
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
LEVEL (SINCE 1990)
REITs
SPX
EY/10Y
Gold
EMG
Dollar
Euro
Metals
A/10Y
Yen
Nat Gas
Oil
EAFE
EY
Cmdty
Food
10Y
-3.0
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
LOW and FALLING
TREND (200 Days)
LOW but RISING



US Financial Conditions Index

Money Market	*Bonds*	*Equity*
TED Spread	Baa/10Y Treasury	S&P 500 Price
LIBOR/OIS Spread	High Yield/10Y	VIX Index
Commercial Paper/Tbill	Muni/10Y	
	Swaption Volitility Index	

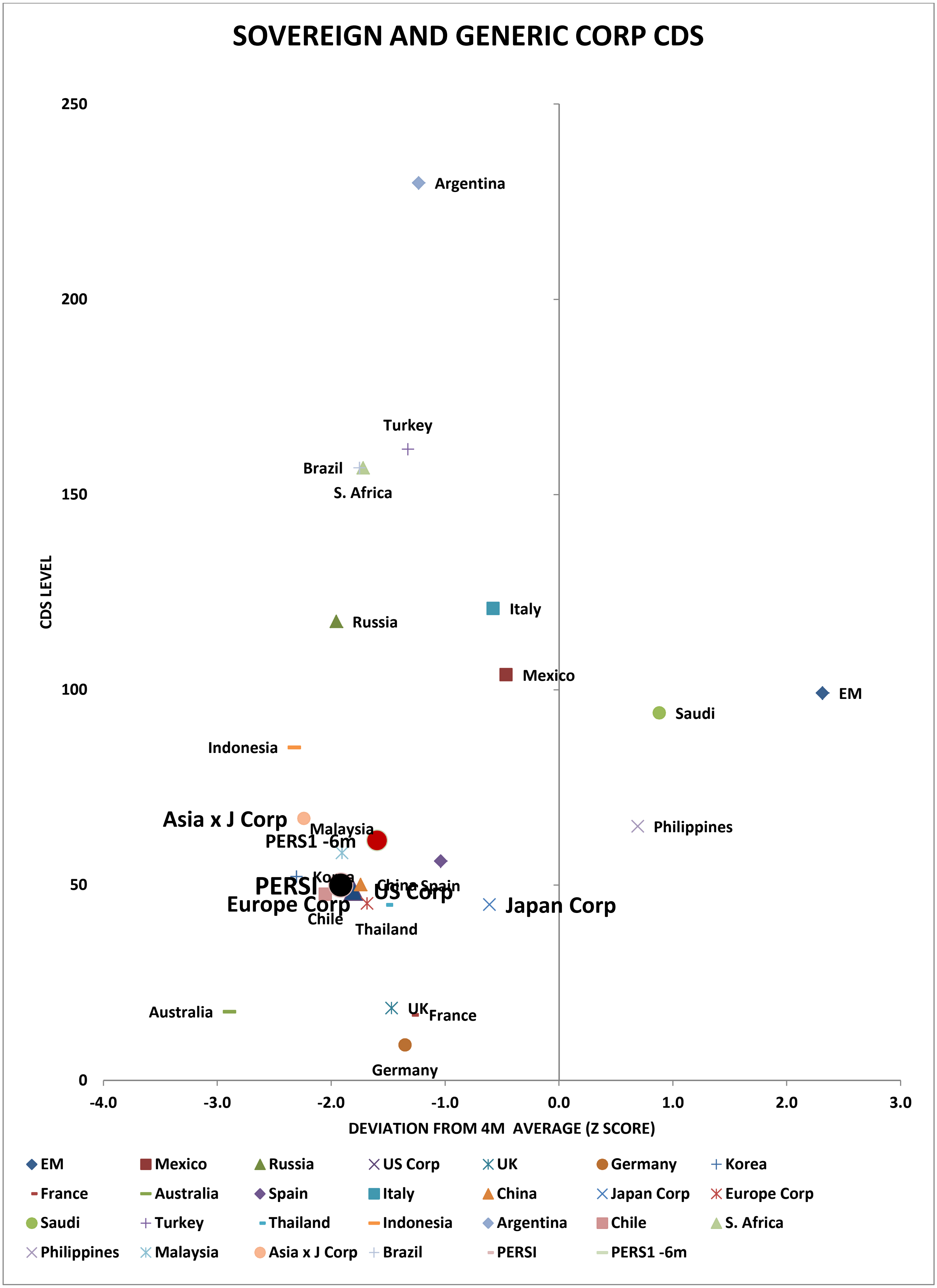
Euro Area Financial Conditions Index

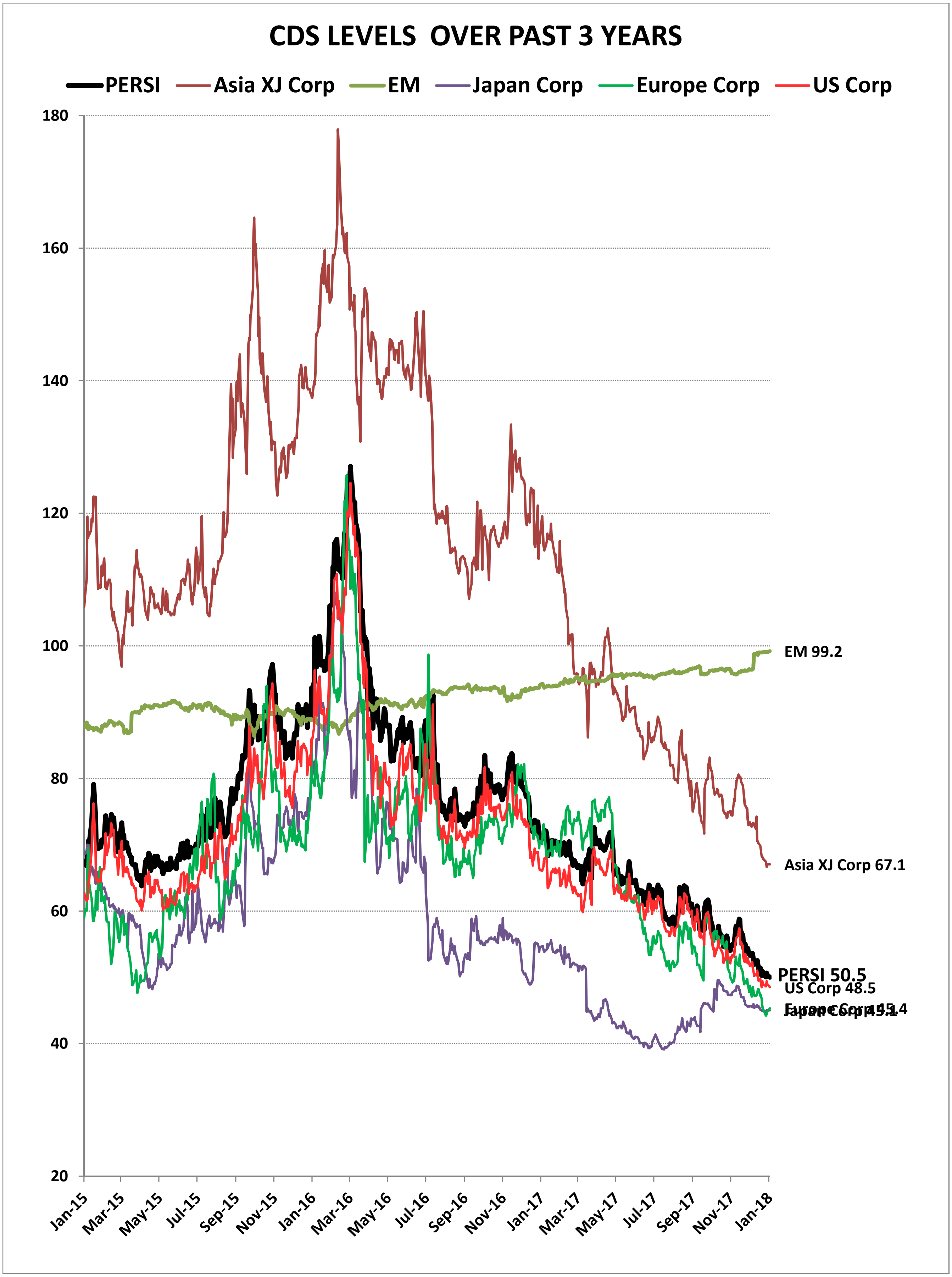
EU Money Market	*EU Bond Market*	*EU Equity*
Euro TED Spread	EU 10Y Swap Spread	Euro Stoxx Index
Eurobor/OIS Spread	JP Morgan HY Europe Index	VDAX-NEW Index

Asia Pacific X Japan Financial Condition Index

Asia Money Market	*Asia Bond Market*	*Asia Equity*	*Asia Capital Flow*
Singapore/LIBOR OIS Spread	JPM EMBI+ Asia Sov Spread	MSCI AsiaX Japan	Bloomberg Asia Carry Trade Index
India LIBOR/OIS Spread			
Hong Kong LIBOR/OIS Spread			
China Real 7-Day Repo Rate			

Financial Conditions Indices are meant to track the overall level of financial stress in the money market, bond, and equity markets to help assess the availability and cost of credit. A positive value indicates accomadative financial conditions, while a negative value indicates tighter financial conditions. The conditions are being compared to "pre-crisis" norms, generally from 1994 - mid 2008.


SOVEREIGN AND GENERIC CORP CDS
250
200
150
100
50
0
CDS LEVEL
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
DEVIATION FROM 4M AVERAGE (Z SCORE)
Argentina
Turkey
Brazil
S. Africa
Italy
Russia
Mexico
EM
Saudi
Indonesia
Asia x J Corp
Malaysia
PERS1 -6m
Philippines
Korea
PERSI
China
Spain
US Corp
Europe Corp
Chile
Japan Corp
Thailand
Australia
UK
France
Germany
EM
Mexico
Russia
US Corp
UK
Germany
Korea
France
Australia
Spain
Italy
China
Japan Corp
Europe Corp
Saudi
Turkey
Thailand
Indonesia
Argentina
Chile
S. Africa
Philippines
Malaysia
Asia x J Corp
Brazil
PERSI
PERS1 -6m


CDS LEVELS OVER PAST 3 YEARS
PERSI
Asia XJ Corp
EM
Japan Corp
Europe Corp
US Corp
180
160
140
120
100
80
60
40
20
EM 99.2
Asia XJ Corp 67.1
PERSI 50.5
US Corp 48.5
Europe Corp 45.4
Japan Corp 45.1
Jan-15
Mar-15
May-15
Jul-15
Sep-15
Nov-15
Jan-16
Mar-16
May-16
Jul-16
Sep-16
Nov-16
Jan-17
Mar-17
May-17
Jul-17
Sep-17
Nov-17
Jan-18