Presentation to Economic Outlook and Revenue Assessment Committee

CAPITAL MARKET OUTLOOK

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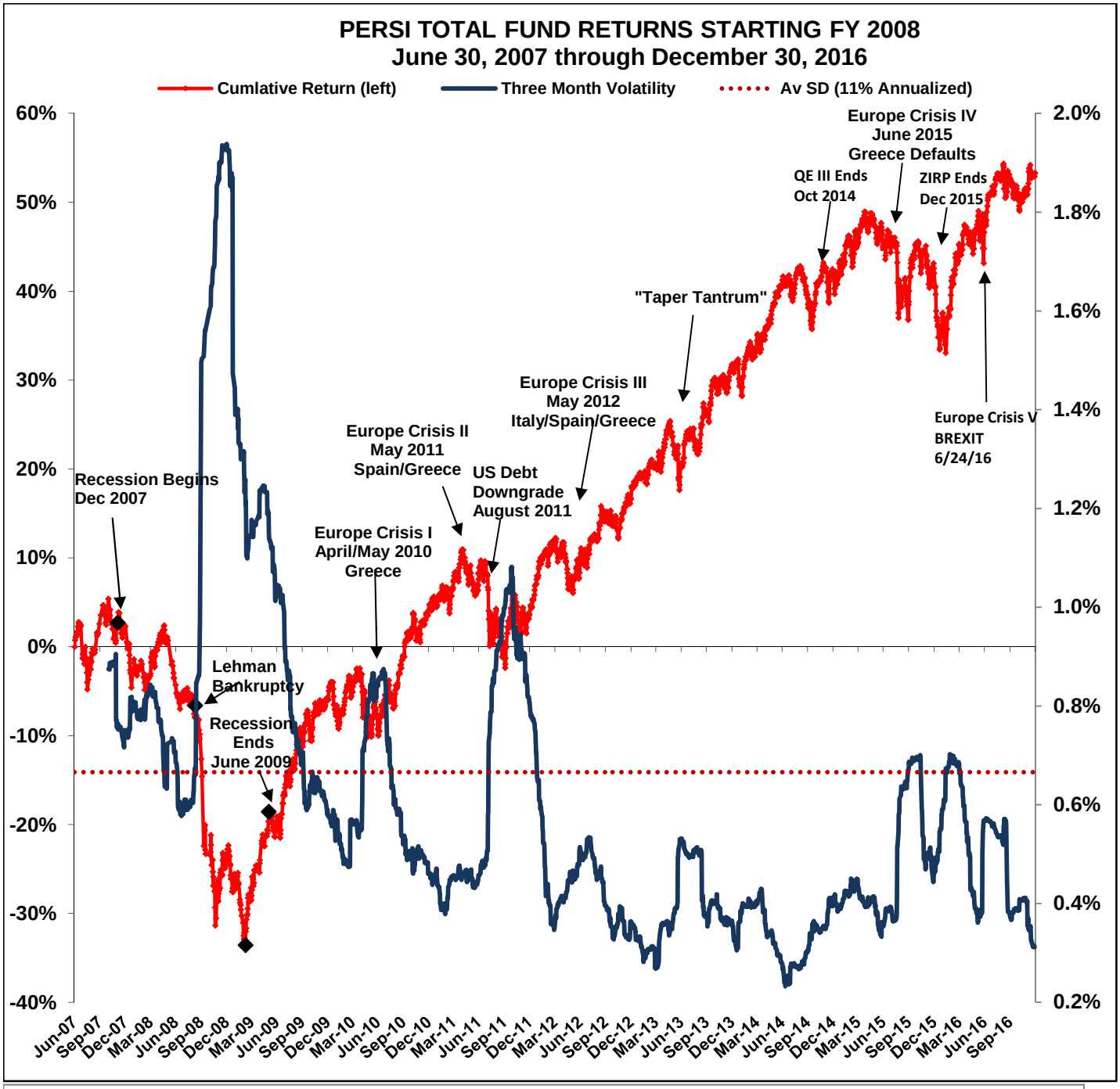
Chief Investment Officer

January 5, 2017

Capital Markets Outlook Warmer But Still Tepid

- 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


PERSI TOTAL FUND RETURNS STARTING FY 2008
June 30, 2007 through December 30, 2016
Cumlative Return (left)
Three Month Volatility
Av SD (11% Annualized)
60%
50%
40%
30%
20%
10%
0%
-10%
-20%
-30%
-40%
2.0%
1.8%
1.6%
1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
Recession Begins
Dec 2007
Lehman
Bankruptcy
Recession
Ends
June 2009
Europe Crisis I
April/May 2010
Greece
Europe Crisis II
May 2011
Spain/Greece
US Debt
Downgrade
August 2011
Europe Crisis III
May 2012
Italy/Spain/Greece
"Taper Tantrum"
QE III Ends
Oct 2014
Europe Crisis IV
June 2015
Greece Defaults
ZIRP Ends
Dec 2015
Europe Crisis V
BREXIT
6/24/16
Jun-07
Sep-07
Dec-07
Mar-08
Jun-08
Sep-08
Dec-08
Mar-09
Jun-09
Sep-09
Dec-09
Mar-10
Jun-10
Sep-10
Dec-10
Mar-11
Jun-11
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Jun-12
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Dec-12
Mar-13
Jun-13
Sep-13
Dec-13
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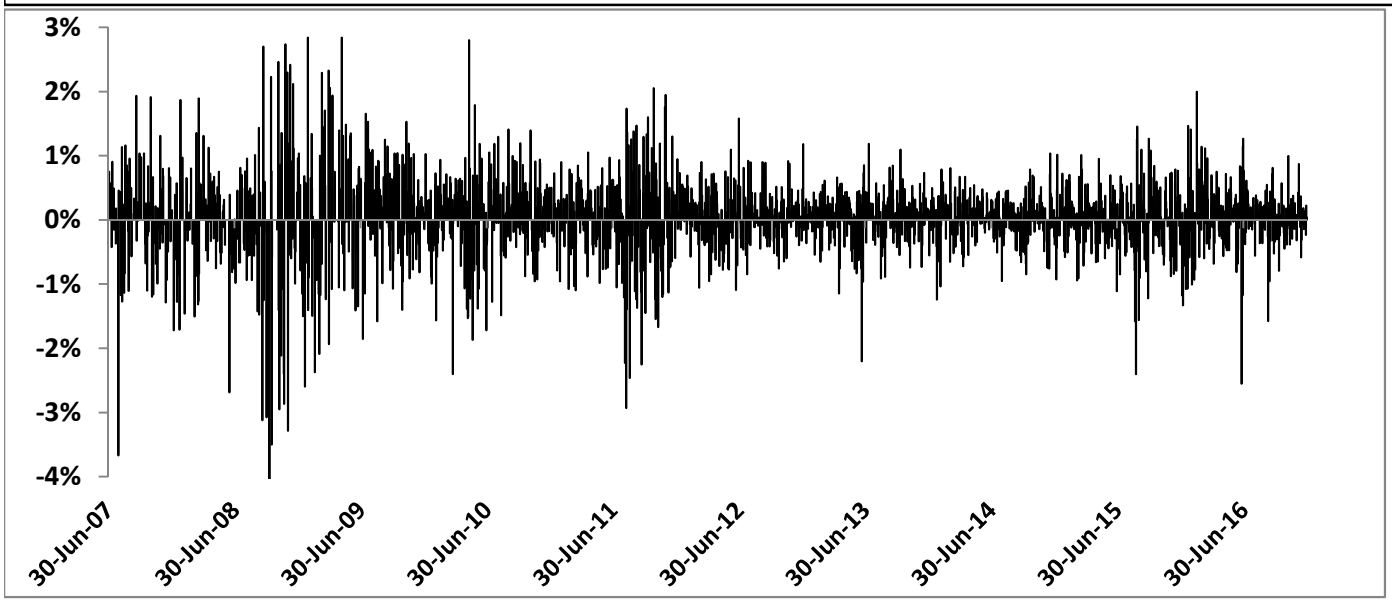
Jun-15
Sep-15
Dec-15
Mar-16
Jun-16
Sep-16

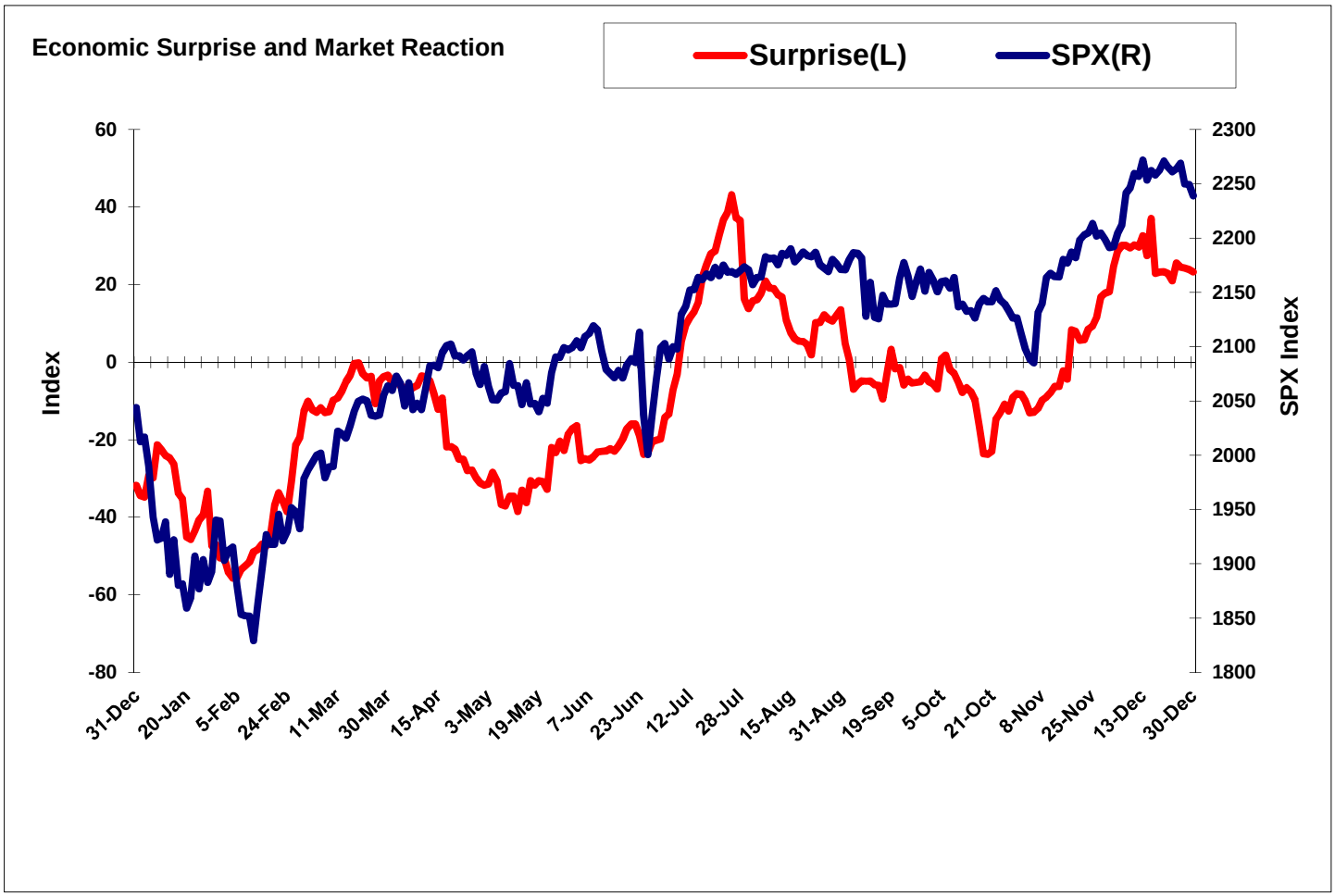

3%
2%
1%
0%
-1%
-2%
-3%
-4%
30-Jun-07
30-Jun-08
30-Jun-09
30-Jun-10
30-Jun-11
30-Jun-12
30-Jun-13
30-Jun-14
30-Jun-15
30-Jun-16

BASIC CAPITAL MARKET CONCEPTS

- **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

- **EXPECTATIONS**
  - Not Current Conditions
  - Example: Predictions of Current Bond Yields (Yield Curve), Relative P/E ratios

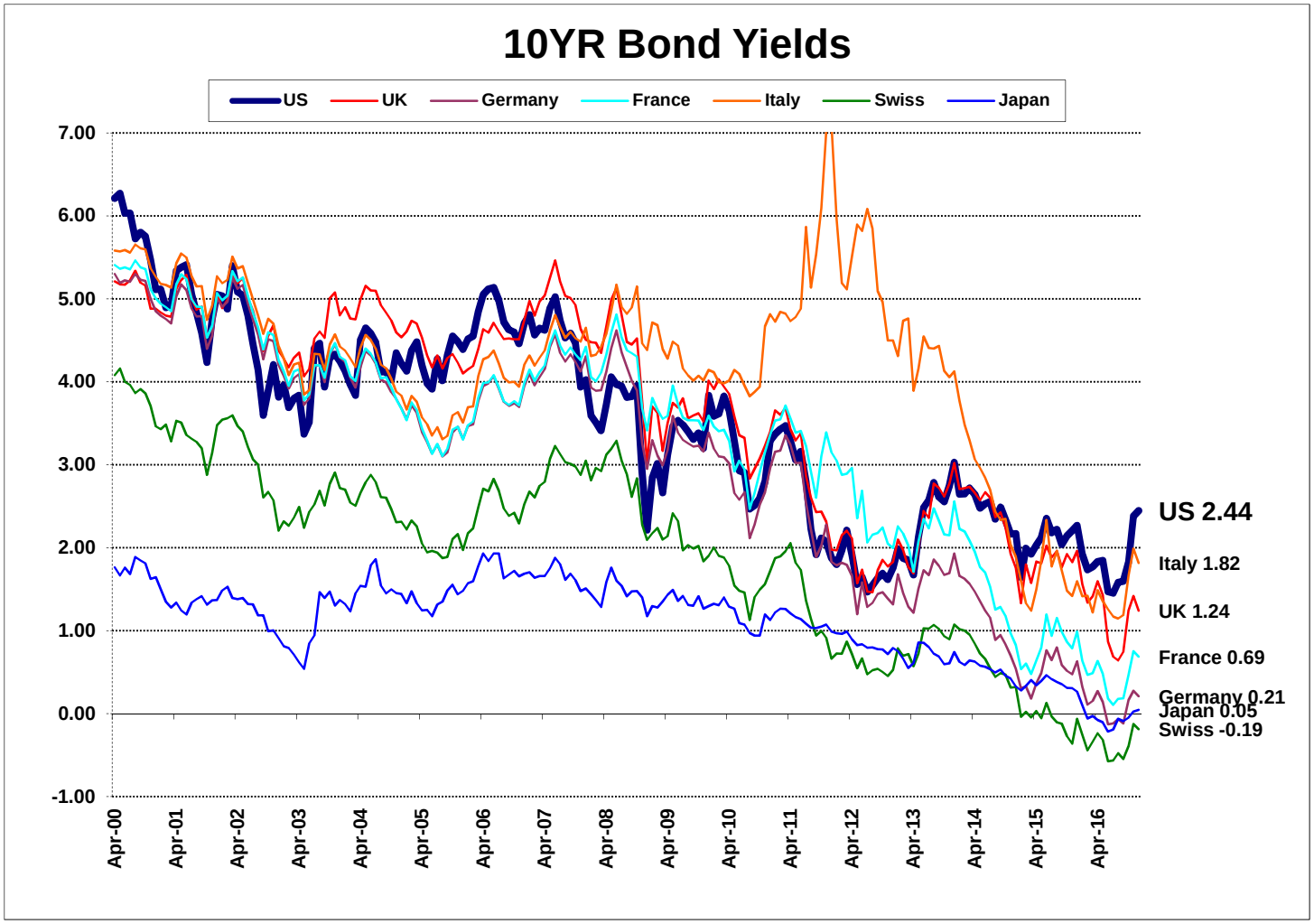
- **PROFITS OR EARNINGS**
  - Not general economy
  - Example: S&P 500 vs GDP, Source of Revenues

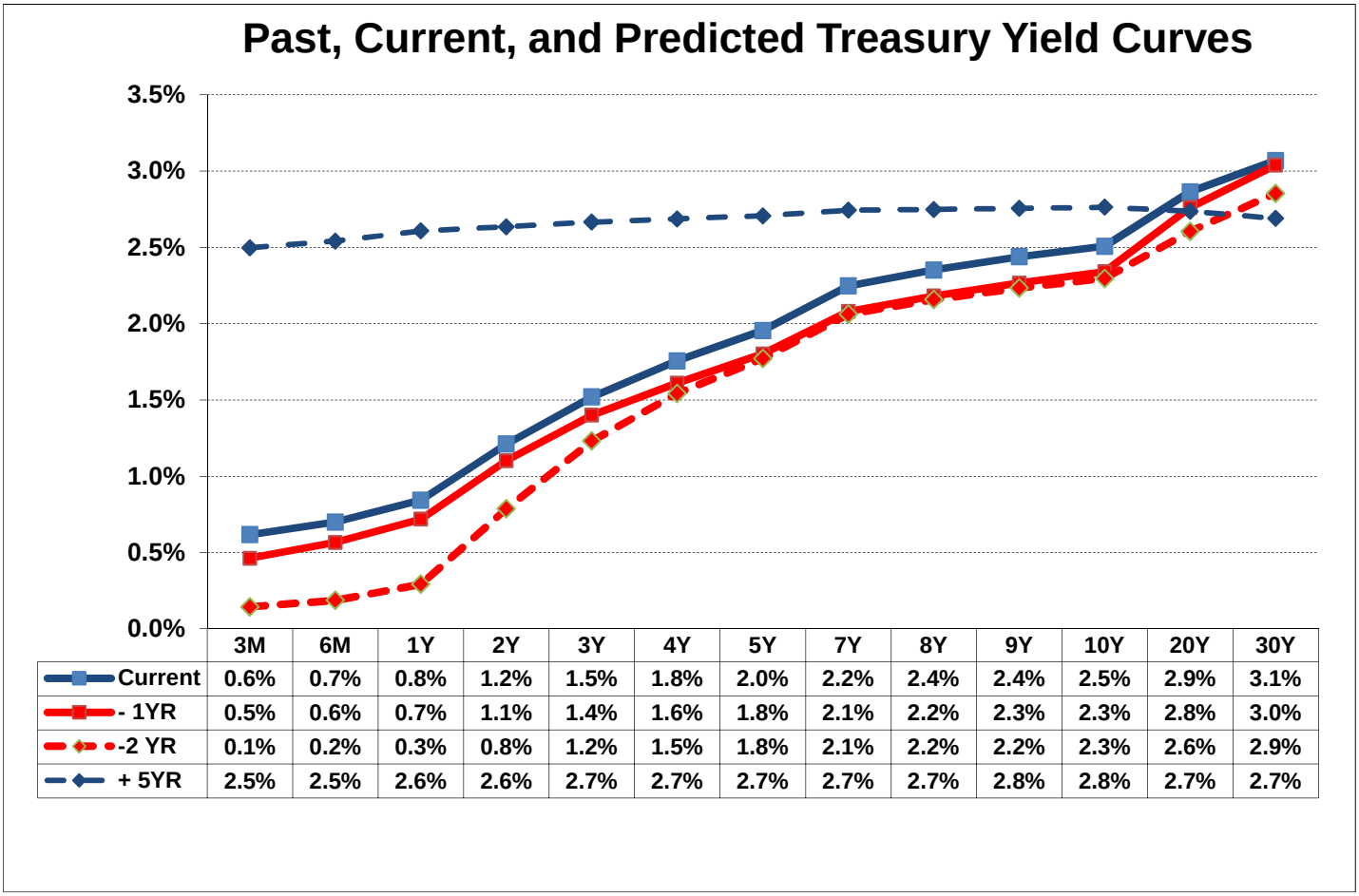


ECONOMIC EXPECTATIONS

	Projected 2016	Actual 2016	Projected 2017
Real GDP	2.5%	1.9%	2.3%
Nominal GDP	4.2%	4.1%	4.3%
Core CPI Inflation	1.7%	1.9%	2.4%
Real Consumption	2.9%	2.6%	2.5%
Real Bus Spend	4.3%	-0.5%	2.5%
Pre-Tax Corp Profit	3.3%	-0.2%	4.0%
Real Ind. Product	1.8%	-0.9%	1.5%
Unemployment	4.8%	4.9%	4.6%
Housing Starts	1,260,000	1,170,000	1,260,000
Europe Real GDP	1.7%	1.6%	1.4%
Europe Inflation	1.0%	0.2%	1.3%
China Real GDP	6.5%	6.7%	6.4%
China Inflation	1.7%	2.0%	2.1%

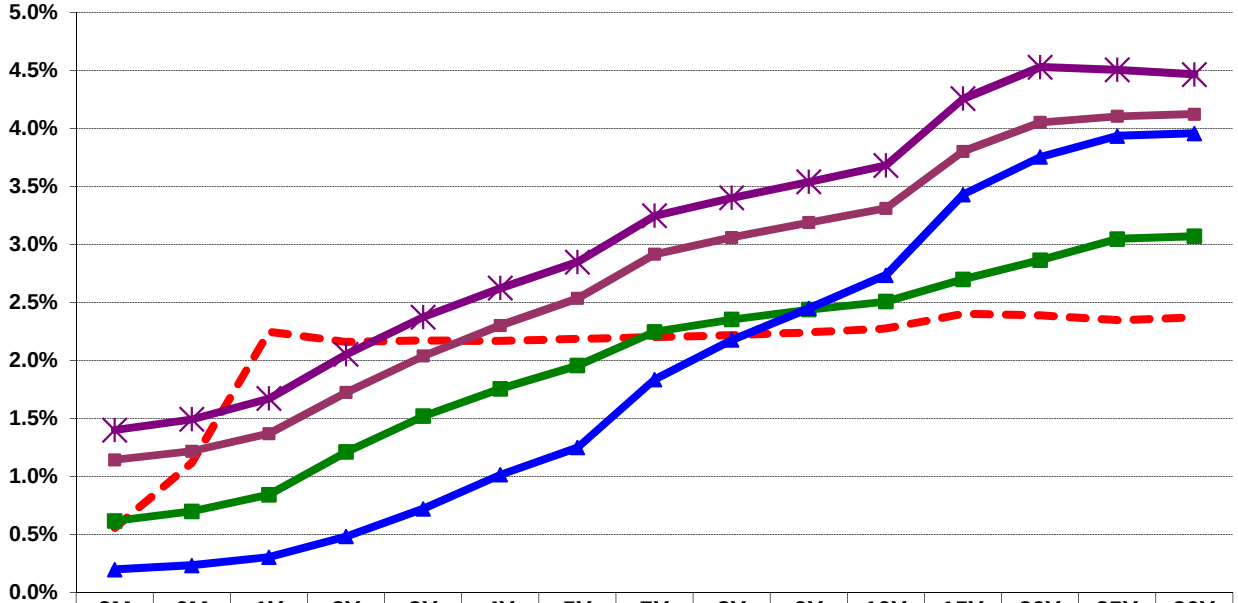
Consensus Economics





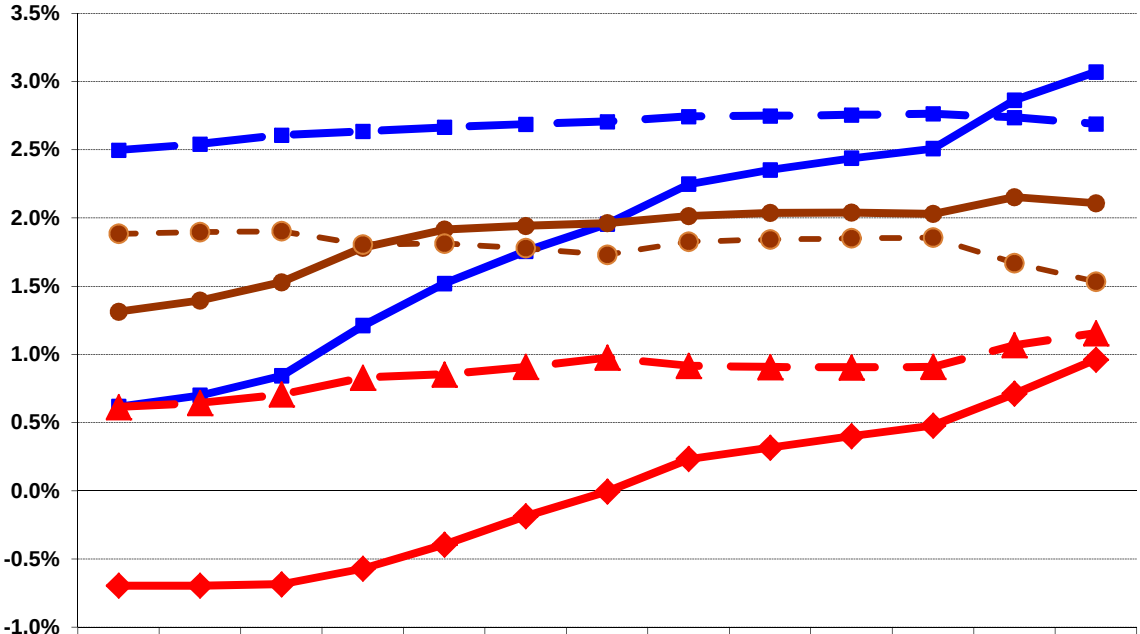
	3M	6M	1Y	2Y	3Y	4Y	5Y	7Y	8Y	9Y	10Y	20Y	30Y
Current	0.6%	0.7%	0.8%	1.2%	1.5%	1.8%	2.0%	2.2%	2.4%	2.4%	2.5%	2.9%	3.1%
- 1YR	0.5%	0.6%	0.7%	1.1%	1.4%	1.6%	1.8%	2.1%	2.2%	2.3%	2.3%	2.8%	3.0%
-2 YR	0.1%	0.2%	0.3%	0.8%	1.2%	1.5%	1.8%	2.1%	2.2%	2.2%	2.3%	2.6%	2.9%
+ 5YR	2.5%	2.5%	2.6%	2.6%	2.7%	2.7%	2.7%	2.7%	2.7%	2.8%	2.8%	2.7%	2.7%

Expected Inflation and Current Yield Curves

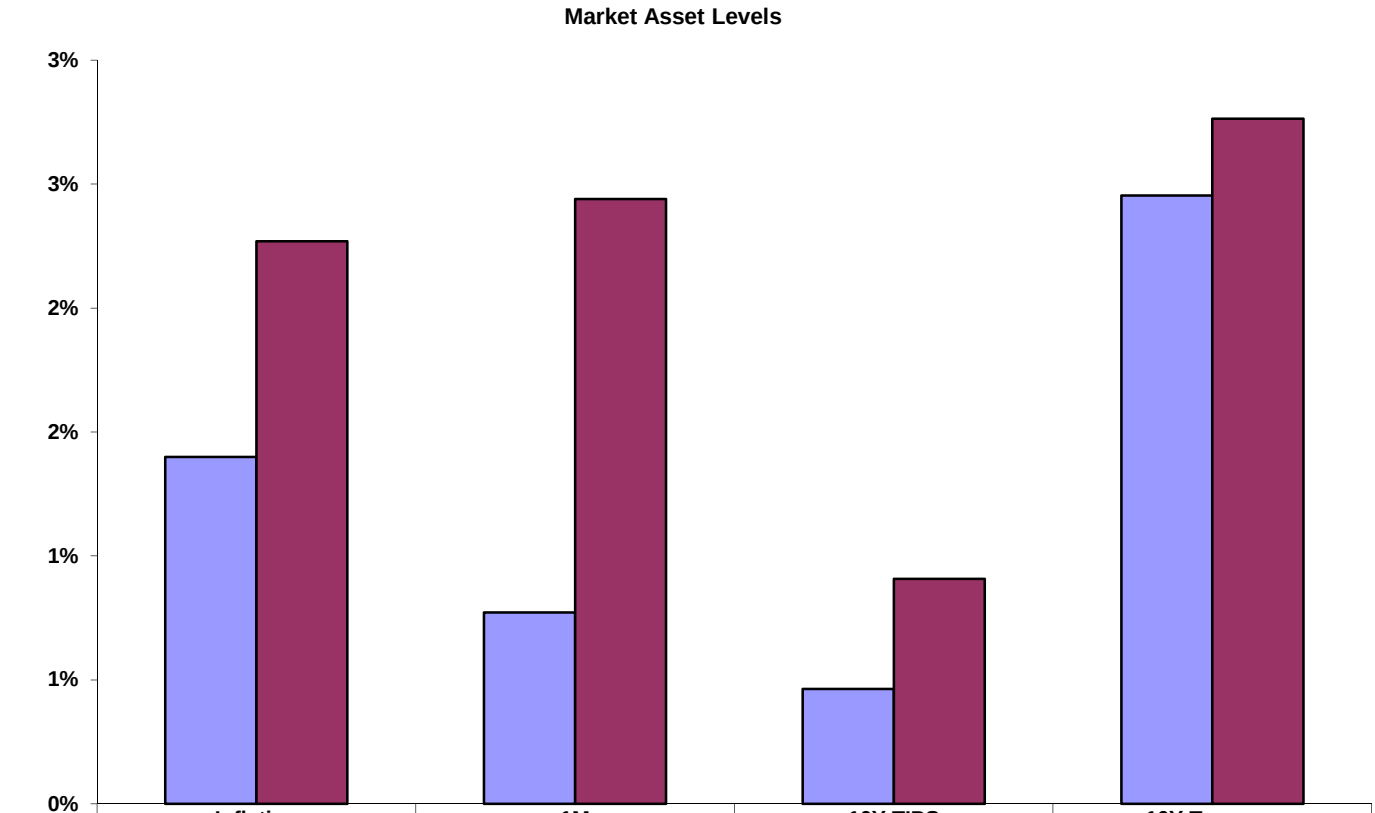


	3M	6M	1Y	2Y	3Y	4Y	5Y	7Y	8Y	9Y	10Y	15Y	20Y	25Y	30Y
Inflation	0.6%	1.1%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.3%	2.4%	2.4%	2.3%	2.4%
Treasury	0.6%	0.7%	0.8%	1.2%	1.5%	1.8%	2.0%	2.2%	2.4%	2.4%	2.5%	2.7%	2.9%	3.0%	3.1%
AAA	0.2%	0.2%	0.3%	0.5%	0.7%	1.0%	1.2%	1.8%	2.2%	2.4%	2.7%	3.4%	3.8%	3.9%	4.0%
A	1.1%	1.2%	1.4%	1.7%	2.0%	2.3%	2.5%	2.9%	3.1%	3.2%	3.3%	3.8%	4.1%	4.1%	4.1%
BBB	1.4%	1.5%	1.7%	2.1%	2.4%	2.6%	2.8%	3.2%	3.4%	3.5%	3.7%	4.3%	4.5%	4.5%	4.5%

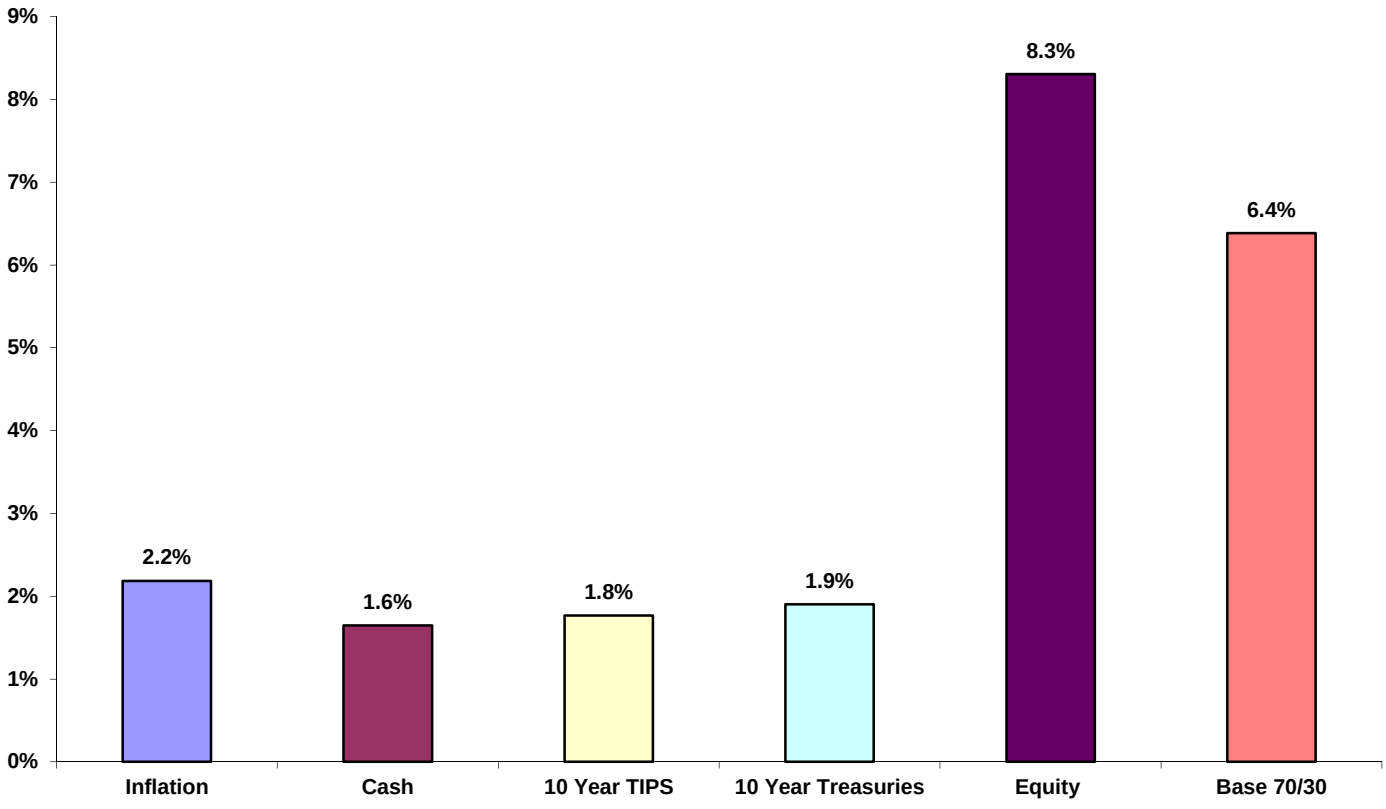
Current and Expected Yield Curves in 5 Yrs



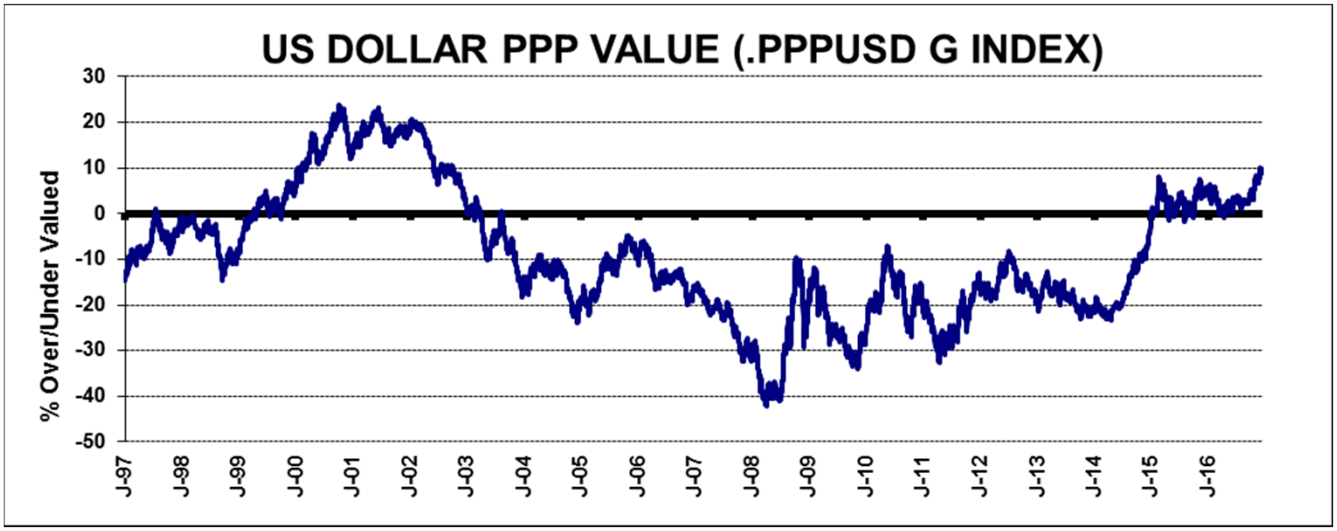
	3M	6M	1Y	2Y	3Y	4Y	5Y	7Y	8Y	9Y	10Y	20Y	30Y
Current TIPS	-0.7%	-0.7%	-0.7%	-0.6%	-0.4%	-0.2%	0.0%	0.2%	0.3%	0.4%	0.5%	0.7%	1.0%
Current Treasury	0.6%	0.7%	0.8%	1.2%	1.5%	1.8%	2.0%	2.2%	2.4%	2.4%	2.5%	2.9%	3.1%
TIPS in 5	0.6%	0.6%	0.7%	0.8%	0.9%	0.9%	1.0%	0.9%	0.9%	0.9%	0.9%	1.1%	1.2%
Treasury in 5	2.5%	2.5%	2.6%	2.6%	2.7%	2.7%	2.7%	2.7%	2.7%	2.8%	2.8%	2.7%	2.7%
Current Breakever	1.3%	1.4%	1.5%	1.8%	1.9%	1.9%	2.0%	2.0%	2.0%	2.0%	2.0%	2.2%	2.1%
Breakeven in 5	1.9%	1.9%	1.9%	1.8%	1.8%	1.8%	1.7%	1.8%	1.8%	1.9%	1.9%	1.7%	1.5%

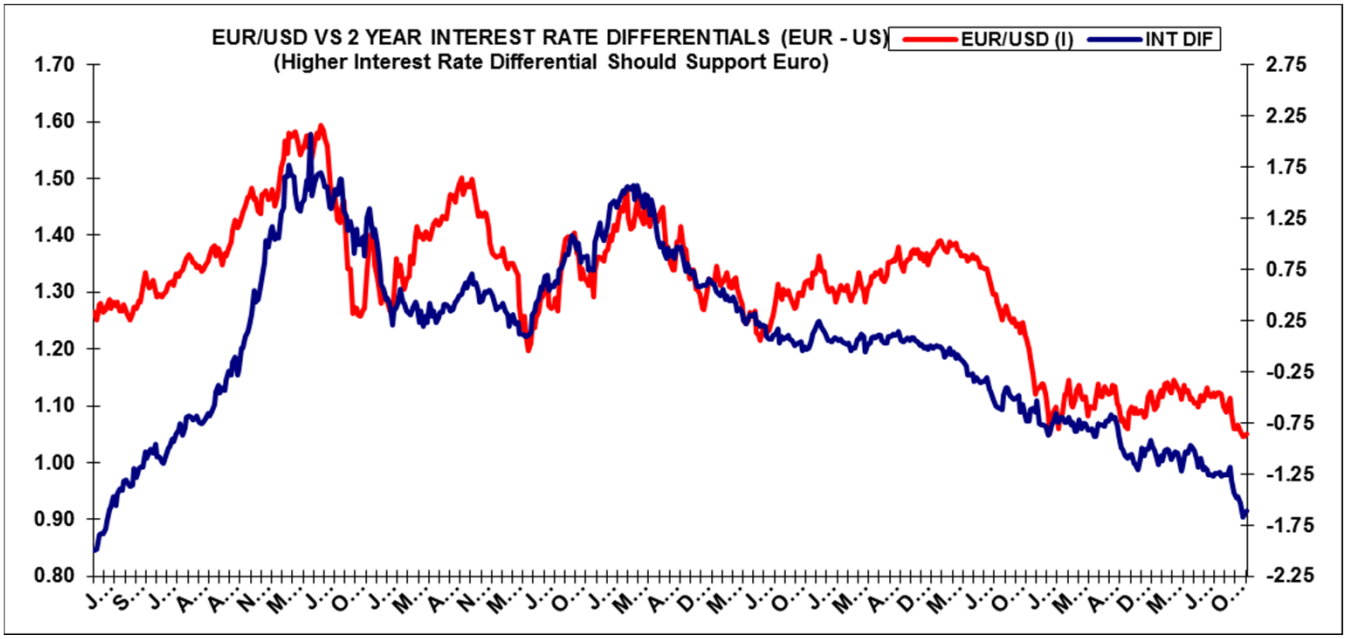


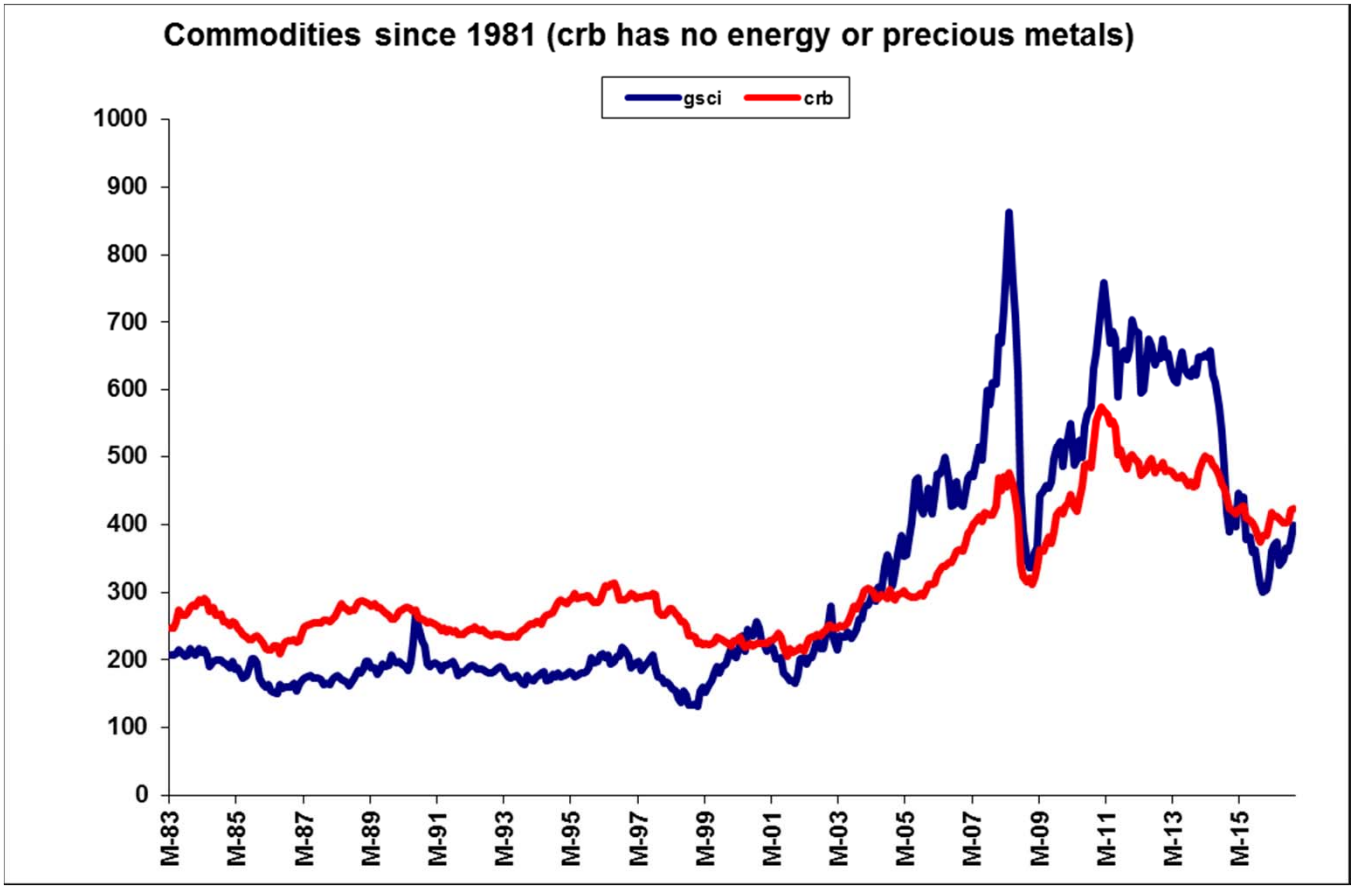
	Inflation	1M	10Y TIPS	10Y Treasury
Today	1.4%	0.8%	0.5%	2.5%
5Y	2.3%	2.4%	0.9%	2.8%

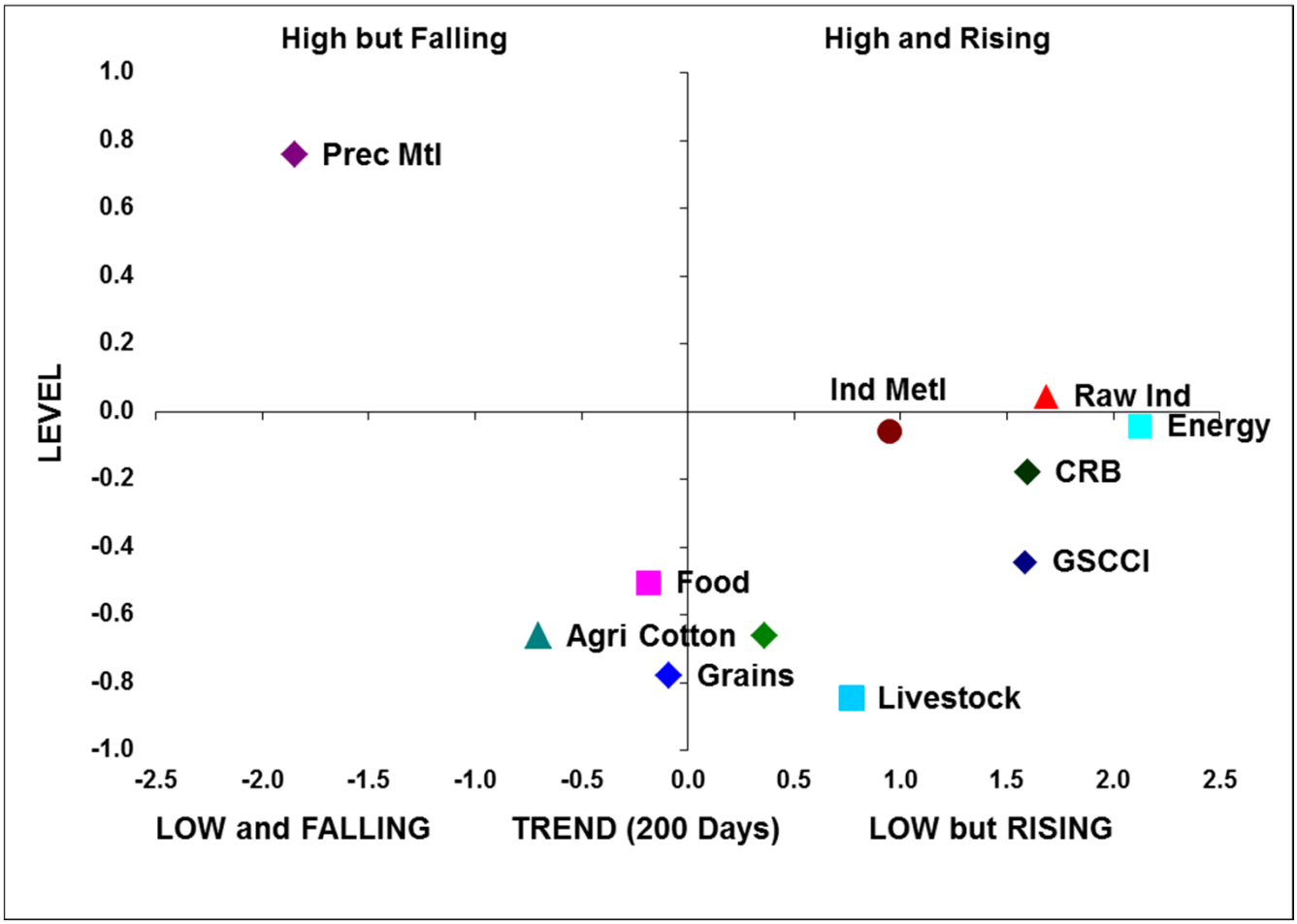


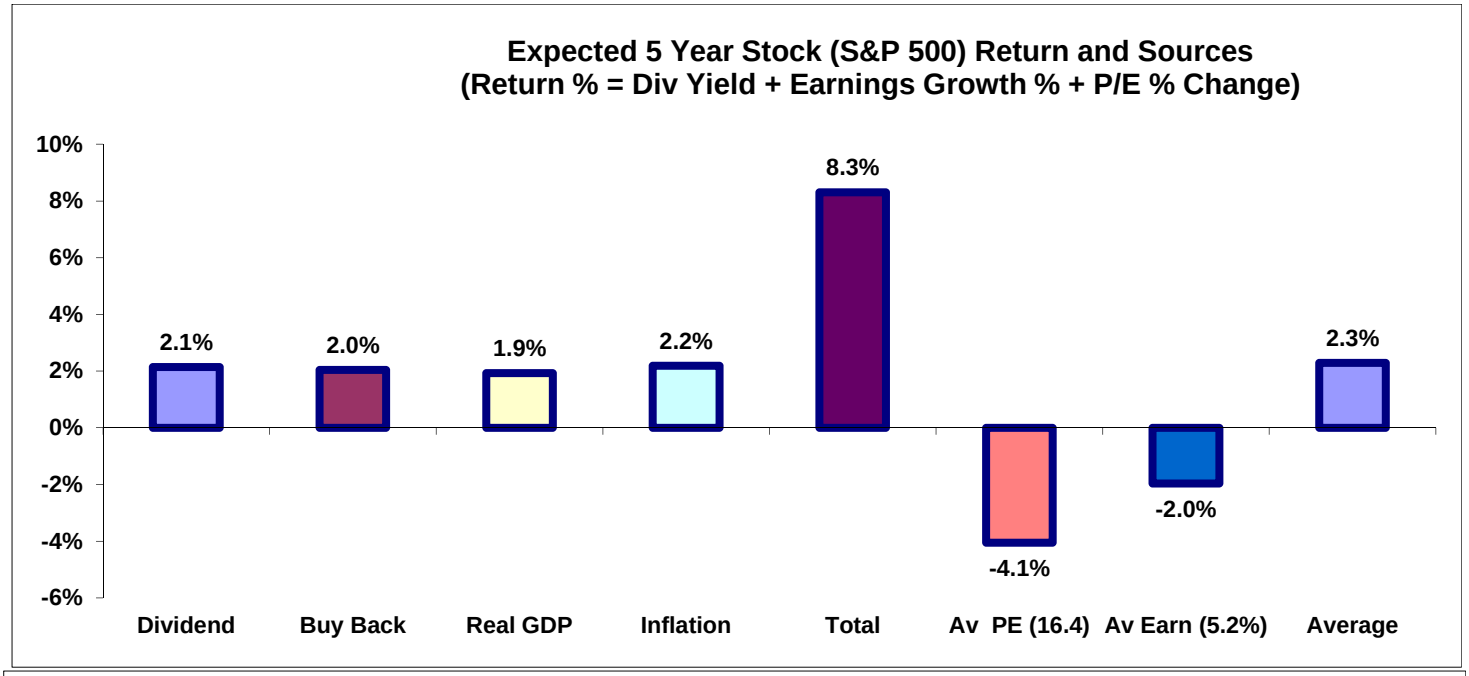
HISTORIC DOLLAR (DXY)
130
120
110
100
90
80
70
60
D-96
D-98
D-00
D-02
D-04
D-06
D-08
D-10
D-12
D-14
D-16

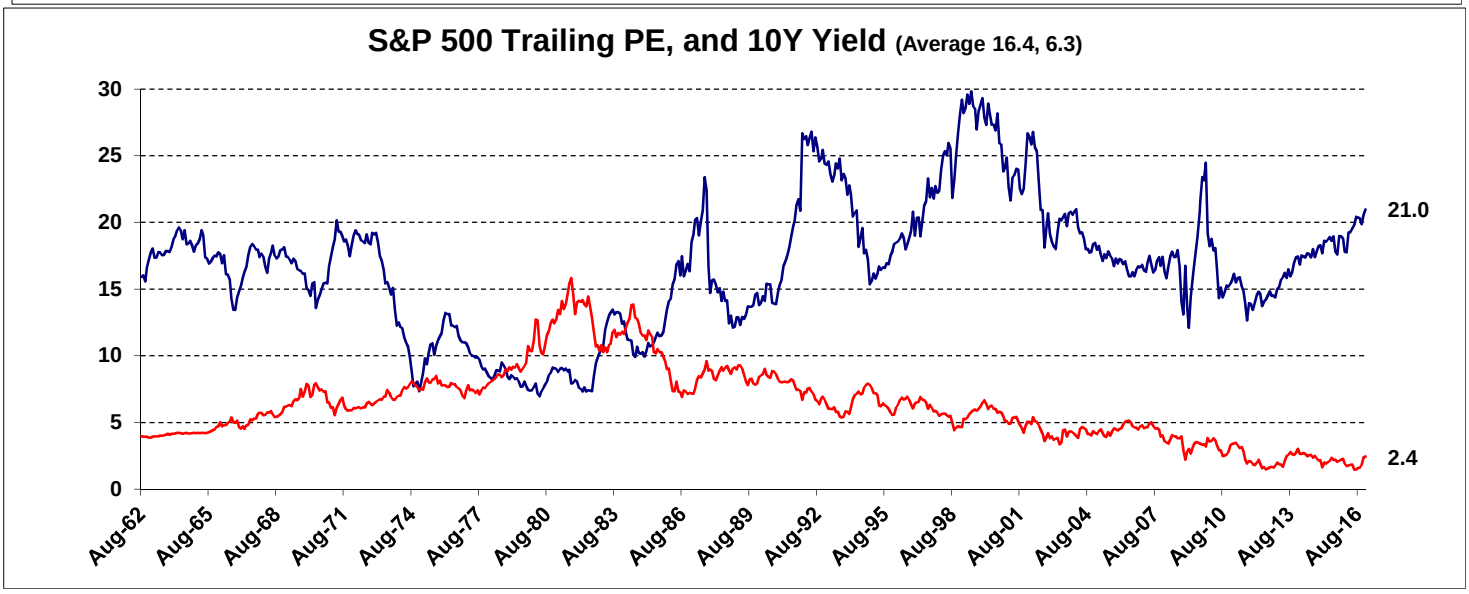

US DOLLAR PPP VALUE (.PPPUSD G INDEX)
% Over/Under Valued
30
20
10
0
-10
-20
-30
-40
-50
J-97
J-98
J-99
J-00
J-01
J-02
J-03
J-04
J-05
J-06
J-07
J-08
J-09
J-10
J-11
J-12
J-13
J-14
J-15
J-16

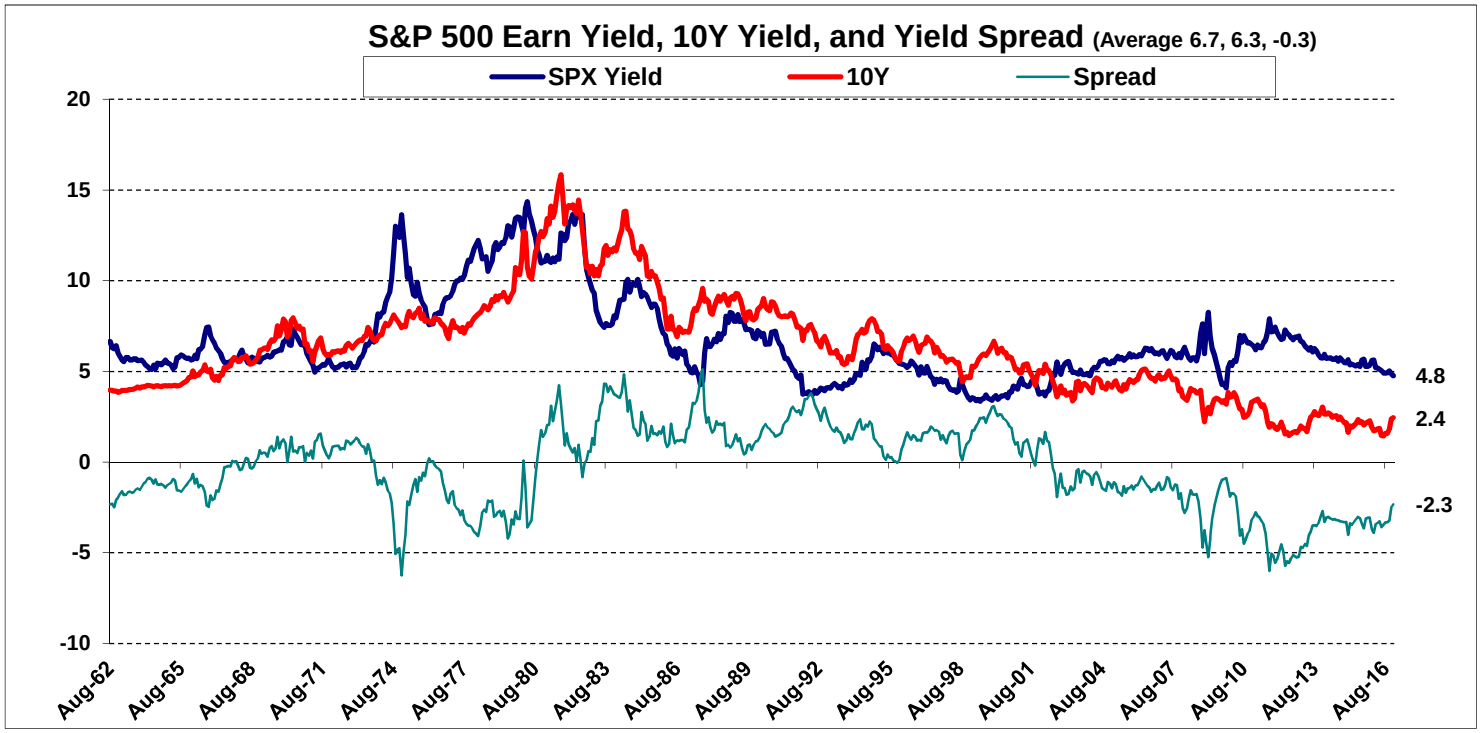

EUR/USD VS 2 YEAR INTEREST RATE DIFFERENTIALS (EUR - US)
(Higher Interest Rate Differential Should Support Euro)
EUR/USD (l)
INT DIF
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
2.75
2.25
1.75
1.25
0.75
0.25
-0.25
-0.75
-1.25
-1.75
-2.25

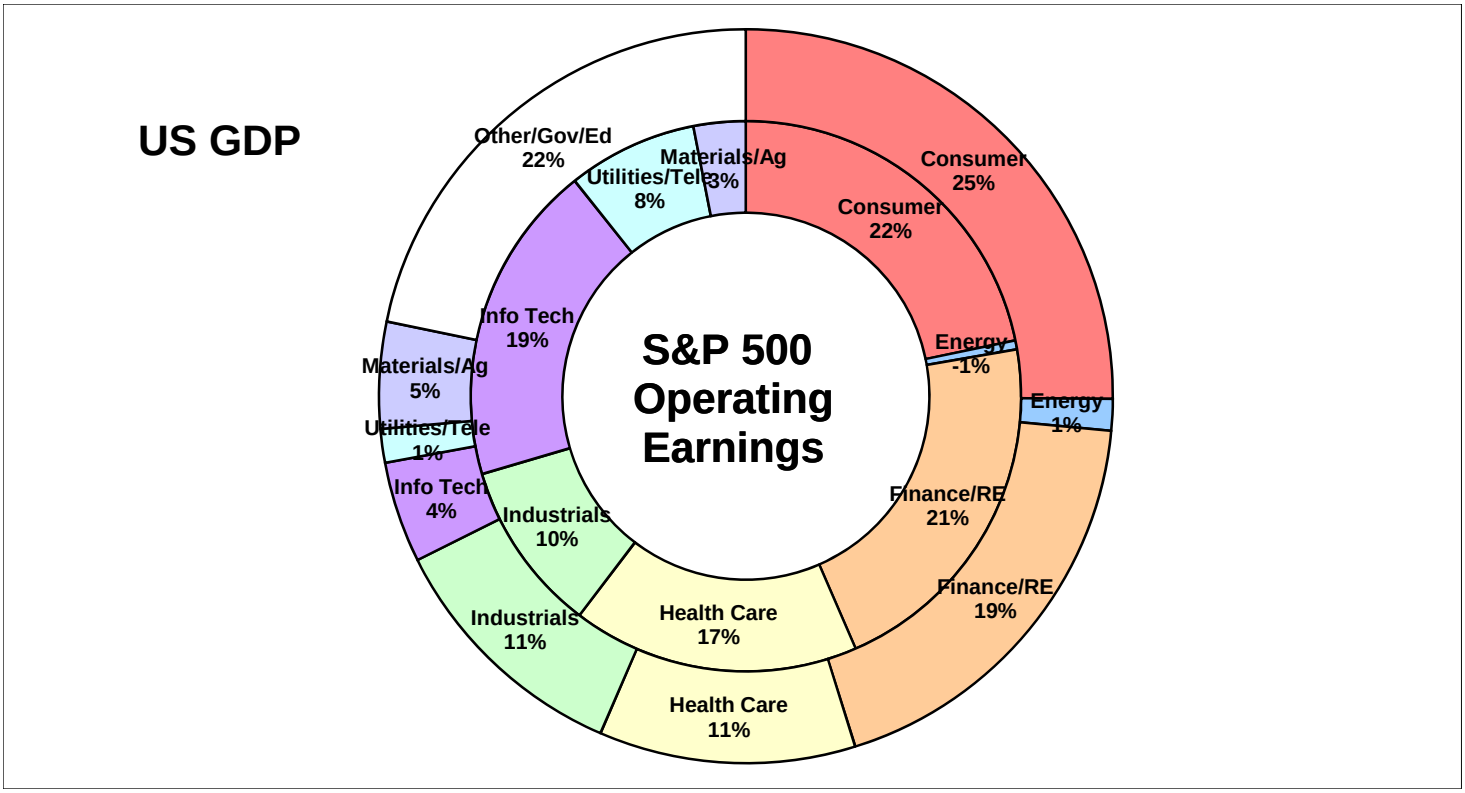

Commodities since 1981 (crb has no energy or precious metals)
gsci
crb
1000
900
800
700
600
500
400
300
200
100
0
M-83
M-85
M-87
M-89
M-91
M-93
M-95
M-97
M-99
M-01
M-03
M-05
M-07
M-09
M-11
M-13
M-15

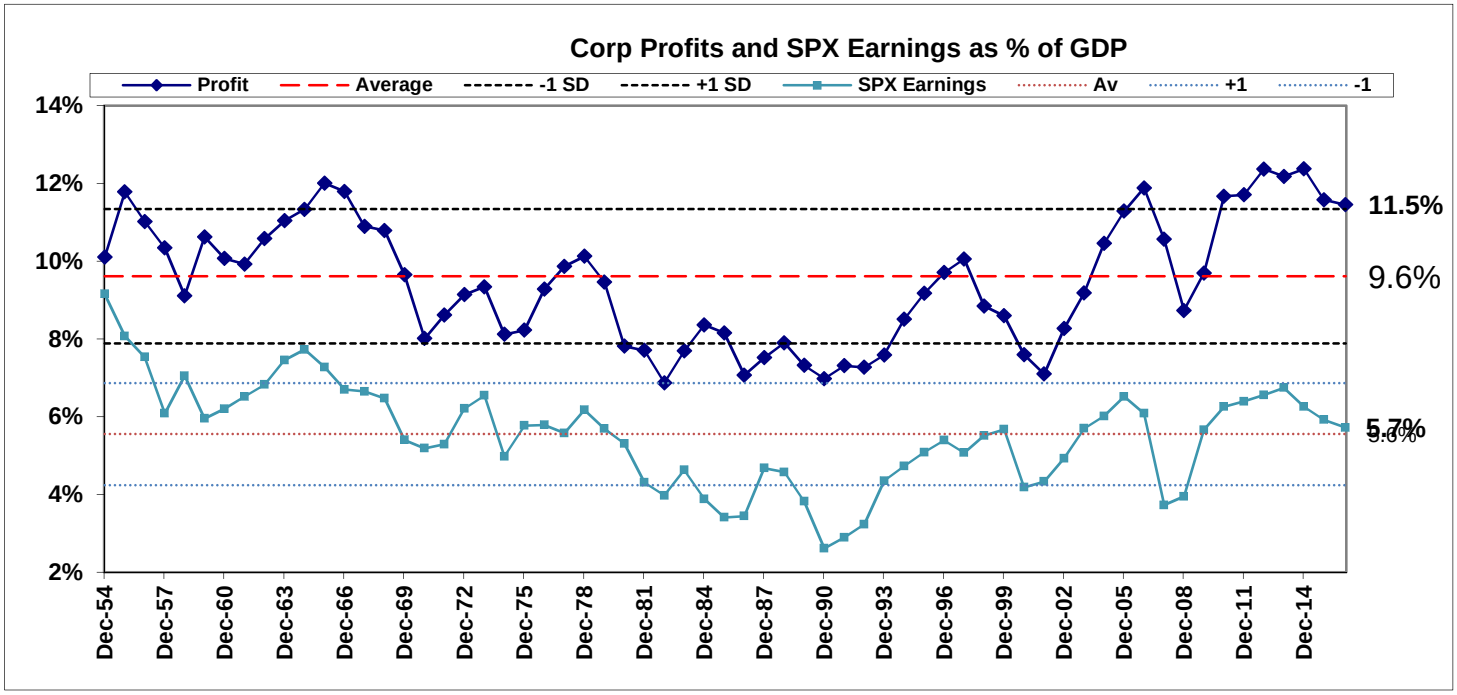

High but Falling
High and Rising
Prec Mtl
Ind Metl
Raw Ind
Energy
CRB
GSCCI
Food
Agri Cotton
Grains
Livestock
LEVEL
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
LOW and FALLING
TREND (200 Days)
LOW but RISING

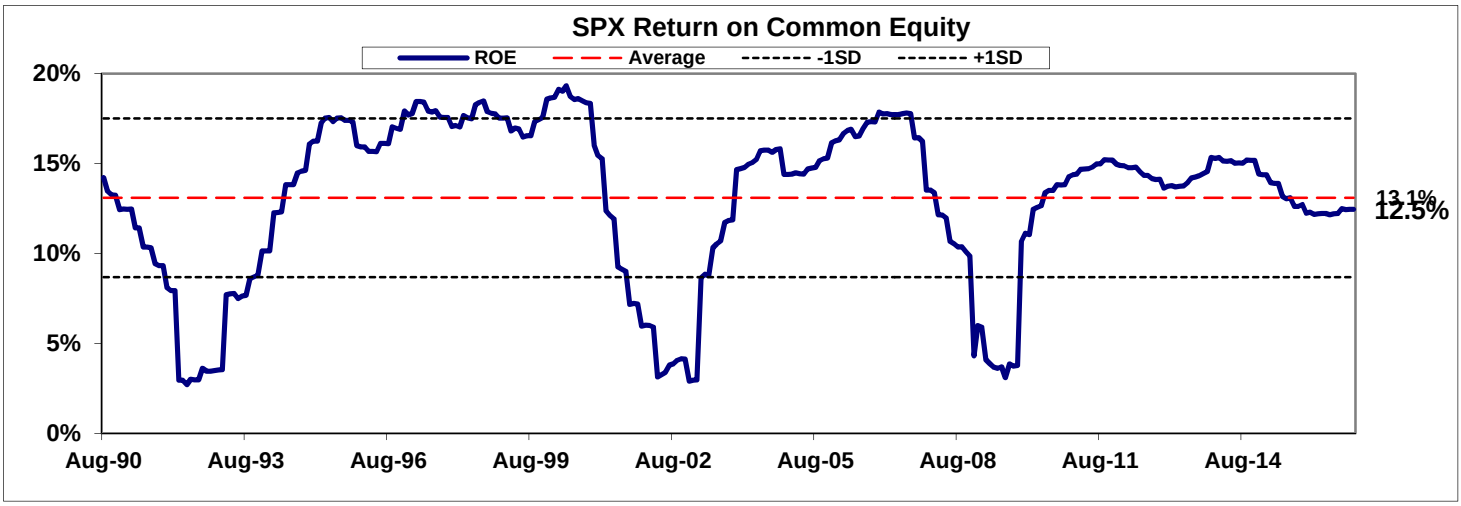

Expected 5 Year Stock (S&P 500) Return and Sources
(Return % = Div Yield + Earnings Growth % + P/E % Change)
10%
8%
6%
4%
2%
0%
-2%
-4%
-6%
2.1%
2.0%
1.9%
2.2%
8.3%
-4.1%
-2.0%
2.3%
Dividend
Buy Back
Real GDP
Inflation
Total
Av PE (16.4)
Av Earn (5.2%)
Average

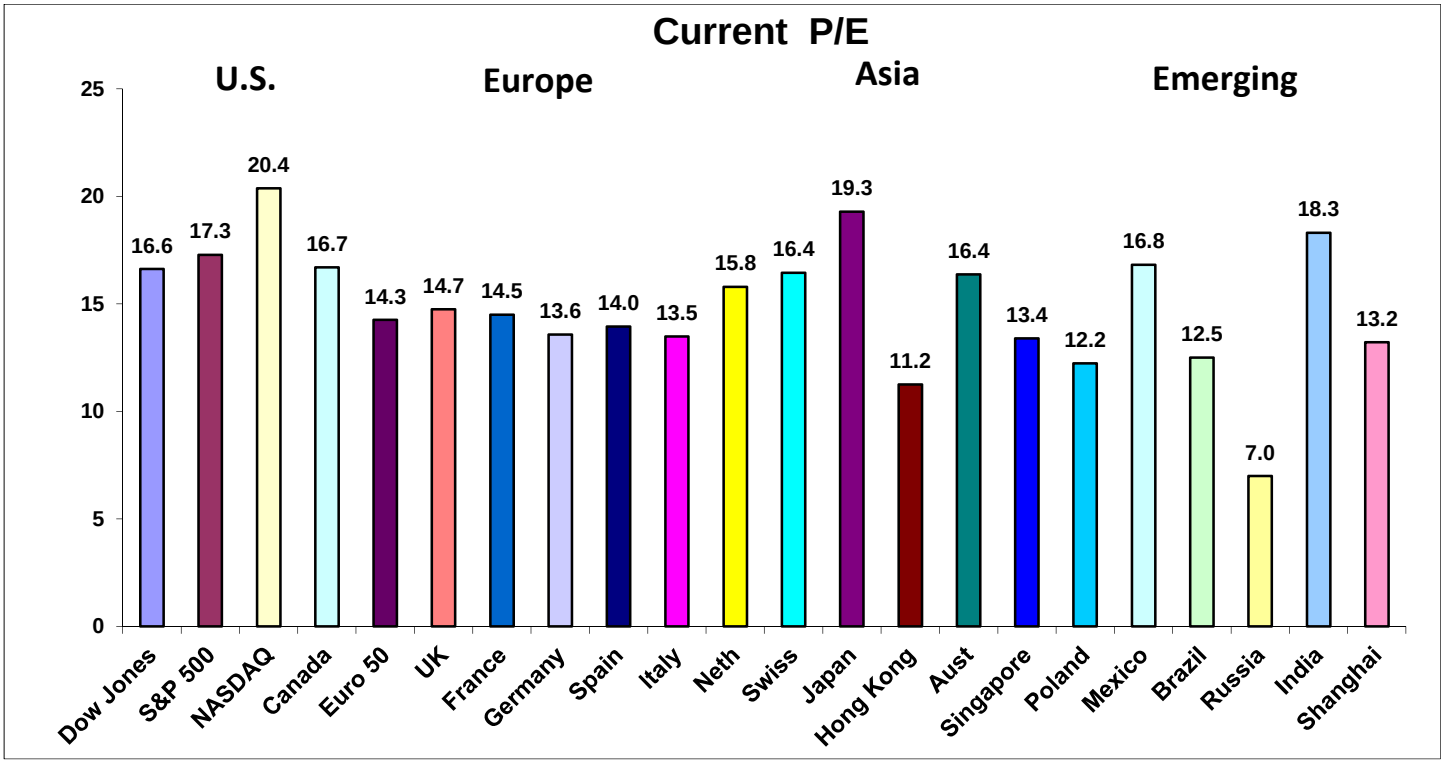

S&P 500 Trailing PE, and 10Y Yield (Average 16.4, 6.3)
30
25
20
15
10
5
0
21.0
2.4
Aug-62
Aug-65
Aug-68
Aug-71
Aug-74
Aug-77
Aug-80
Aug-83
Aug-86
Aug-89
Aug-92
Aug-95
Aug-98
Aug-01
Aug-04
Aug-07
Aug-10
Aug-13
Aug-16

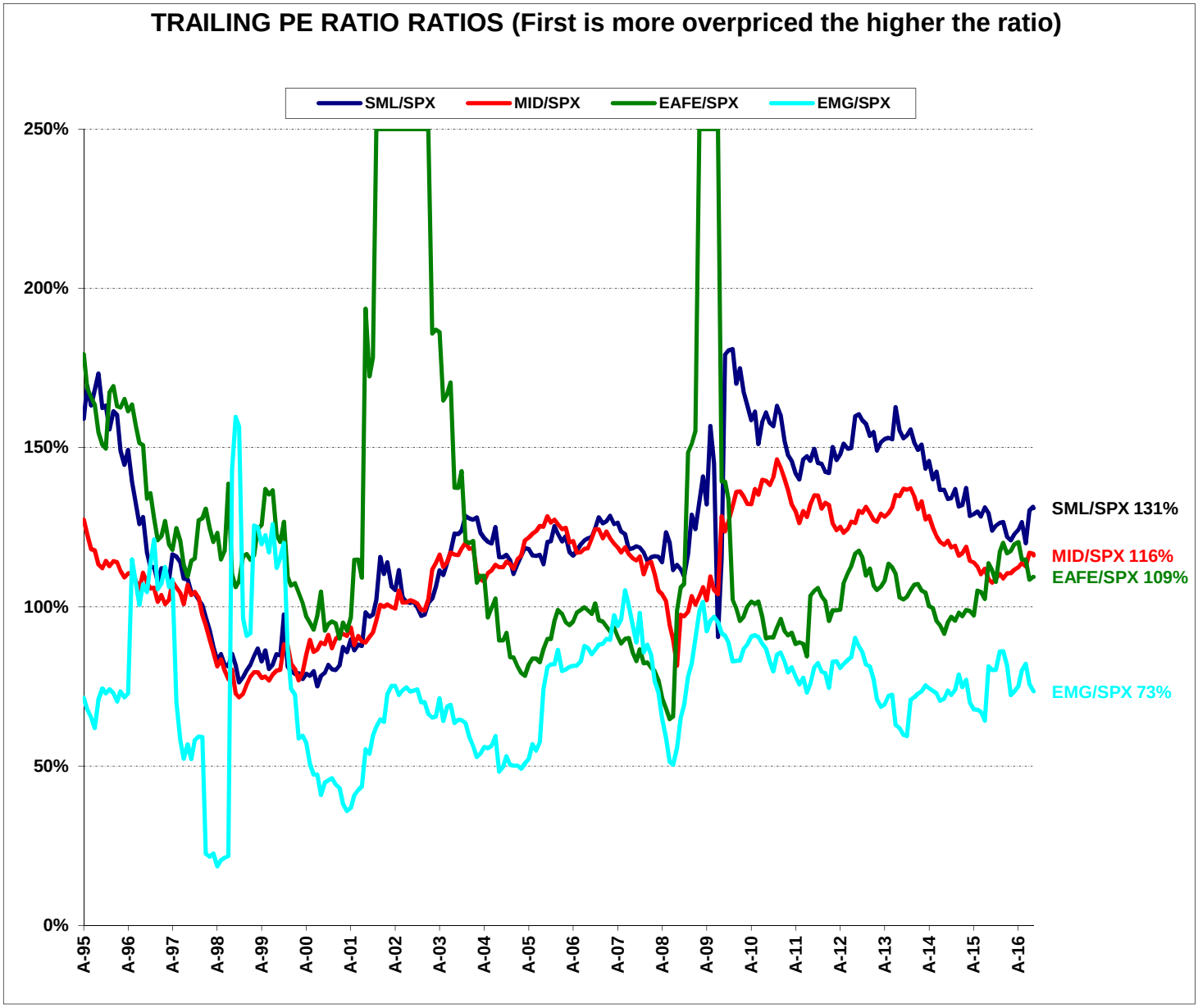

S&P 500 Earn Yield, 10Y Yield, and Yield Spread (Average 6.7, 6.3, -0.3)
SPX Yield
10Y
Spread
20
15
10
5
0
-5
-10
4.8
2.4
-2.3
Aug-62
Aug-65
Aug-68
Aug-71
Aug-74
Aug-77
Aug-80
Aug-83
Aug-86
Aug-89
Aug-92
Aug-95
Aug-98
Aug-01
Aug-04
Aug-07
Aug-10
Aug-13
Aug-16

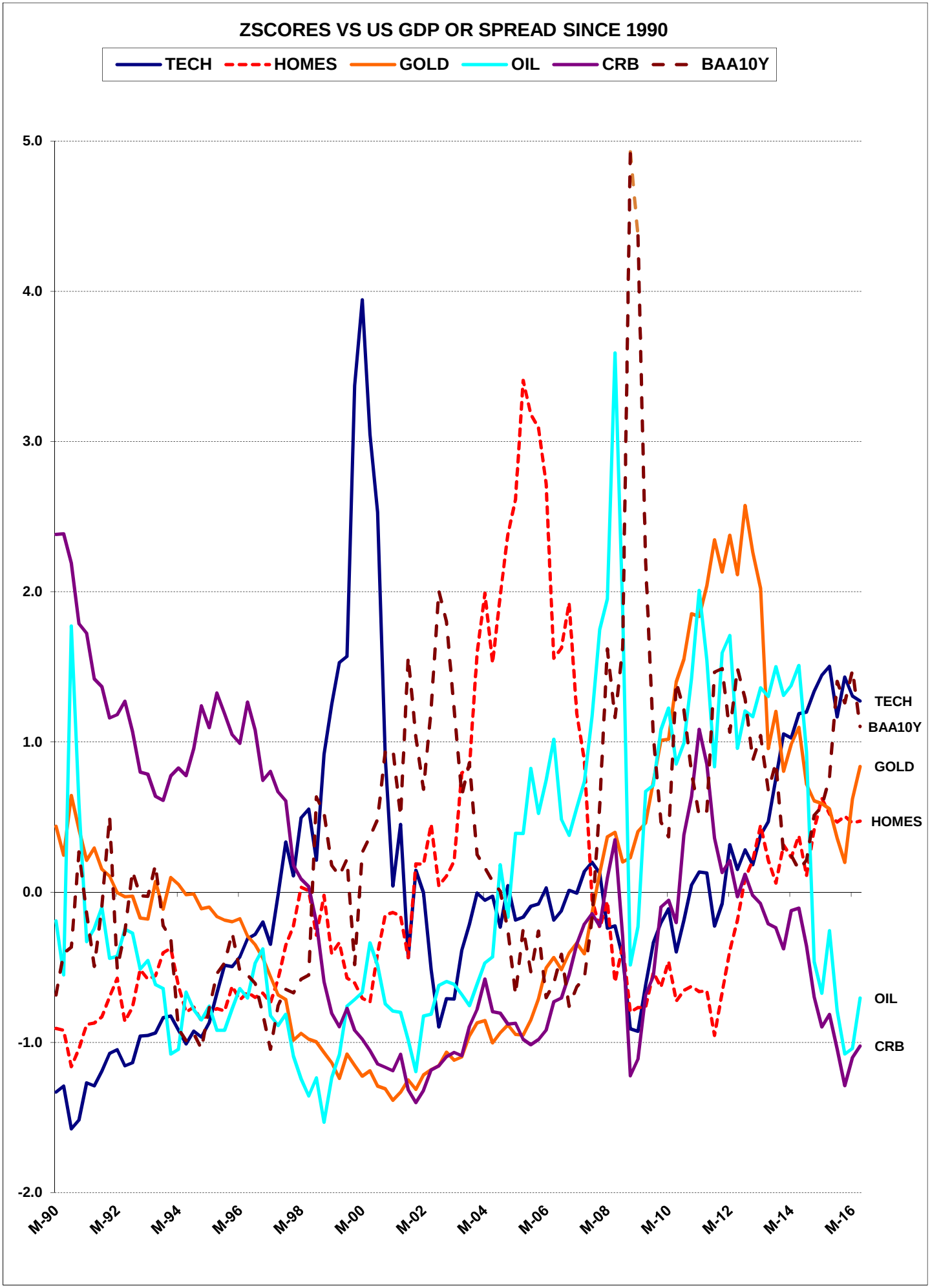

US GDP
S&P 500 Operating Earnings
Other/Gov/Ed 22%
Materials/Ag 3%
Utilities/Tele 8%
Info Tech 19%
Materials/Ag 5%
Utilities/Tele 1%
Info Tech 4%
Industrials 10%
Industrials 11%
Health Care 17%
Health Care 11%
Finance/RE 21%
Finance/RE 19%
Energy -1%
Energy 1%
Consumer 22%
Consumer 25%


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%
11.5%
9.6%
5.7%
Dec-54
Dec-57
Dec-60
Dec-63
Dec-66
Dec-69
Dec-72
Dec-75
Dec-78
Dec-81
Dec-84
Dec-87
Dec-90
Dec-93
Dec-96
Dec-99
Dec-02
Dec-05
Dec-08
Dec-11
Dec-14


SPX Return on Common Equity
ROE
Average
-1SD
+1SD
20%
15%
10%
5%
0%
13.1%
12.5%
Aug-90
Aug-93
Aug-96
Aug-99
Aug-02
Aug-05
Aug-08
Aug-11
Aug-14


Current P/E
U.S.
Europe
Asia
Emerging
25
20
15
10
5
0
16.6
17.3
20.4
16.7
14.3
14.7
14.5
13.6
14.0
13.5
15.8
16.4
19.3
11.2
16.4
13.4
12.2
16.8
12.5
7.0
18.3
13.2
Dow Jones
S&P 500
NASDAQ
Canada
Euro 50
UK
France
Germany
Spain
Italy
Neth
Swiss
Japan
Hong Kong
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%
A-95
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
SML/SPX 131%
MID/SPX 116%
EAFE/SPX 109%
EMG/SPX 73%


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
M-90
M-92
M-94
M-96
M-98
M-00
M-02
M-04
M-06
M-08
M-10
M-12
M-14
M-16
TECH
BAA10Y
GOLD
HOMES
OIL
CRB