Overview of

A Stocks, Bonds, Consumers Leading Index (SBCLI)

A Framework for Forecasting Global Growth

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Need for Economic Forecasts By Businesses, Governments, and Individuals

- Businesses daily make decisions about expansion, contraction, hiring, firing, investment based on economic forecasts.
- Governments daily make decisions on programs, spending and taxation based on economic forecasts.
- Individuals daily make work, leisure, spending and retirement choices based on their forecasts for the economy and markets.

U.S. Leading Economic Index (LEI) Has 10 Components

How much intuition do you have about these factors and how to combine them for economic forecasting?

Leading Economic Index Variable	Weight
1. Average weekly hours, manufacturing	0.2713
2. Average weekly initial claims for unemployment insurance	0.0336
3. Manufacturers' new orders, consumer goods and materials	0.0830
4. ISM® new orders index	0.1606
5. Manufacturers new orders, nondefense capital goods excl. aircraft	0.0409
6. Building permits, new private housing units	0.0312
7. Stock prices, 500 common stocks	0.0392
8. *Leading Credit Index™*	0.0832
9. Interest rate spread, 10-year Treasury bonds less federal funds	0.1102
10. Avg. consumer expectations for business conditions	0.1468

Source: The Conference Board. Note: Factor weightings are inversely related to the volatilities of the variables in order to give more equal influence to fluctuations in the 10 variables.

Overview of This Research (SBCLI©)

With Only Three Key, Intuitive Factors In Forecasting, We Can Do Nearly As Well As The 10 Factor LEI

S. **Stocks: Stock market prices** reflect profit forecasts, which are related to forecasted economic growth.

B. **Bonds: Term structure slope (long term rate – short term rate, e.g., 10 year rate – 3 month rate)** predicts increases and slowdowns in economic growth for advanced economies with little credit risk. For emerging economies, **sovereign bond credit spreads** over USA are used as leading indicators.

C. **Consumers:** Consumers make thoughtful, intelligent choices. **Consumption growth that is independent of stock market returns** reflects consumers' views of jobs, incomes and investment opportunities.

SBCLI© is our Stocks, Bonds, Consumers Leading Index.

S. Stock Market Returns Predict Profits and Economic Growth.

The Stock Market Is the Most Established Economic Forecaster

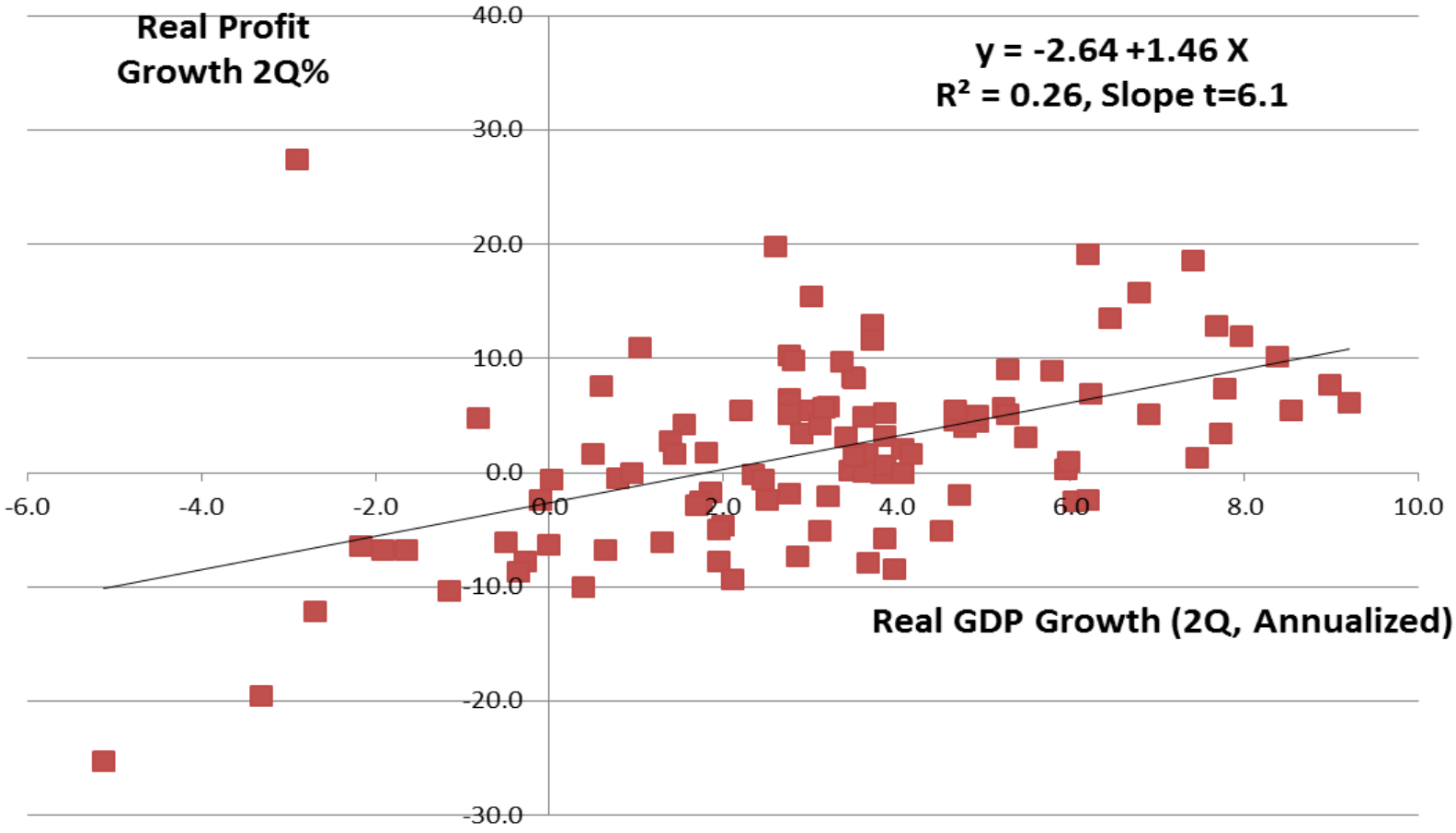
- For decades, it has been recognized that investors use forecasts of economic growth to inform when to buy and sell stocks, as economic growth affects corporate profits greatly. When stock prices decline, it is often viewed as a forecast that the economy will be weaker. When stock prices surge, it is typically assumed that the economy will be stronger.

- Nobel Laureate Eugene Fama's work in 1981 showed that this is true statistically, and the return on the stock market is the most important factor in the Index of Leading Economic Indicators.

- The following graphs show some of the evidence for this.

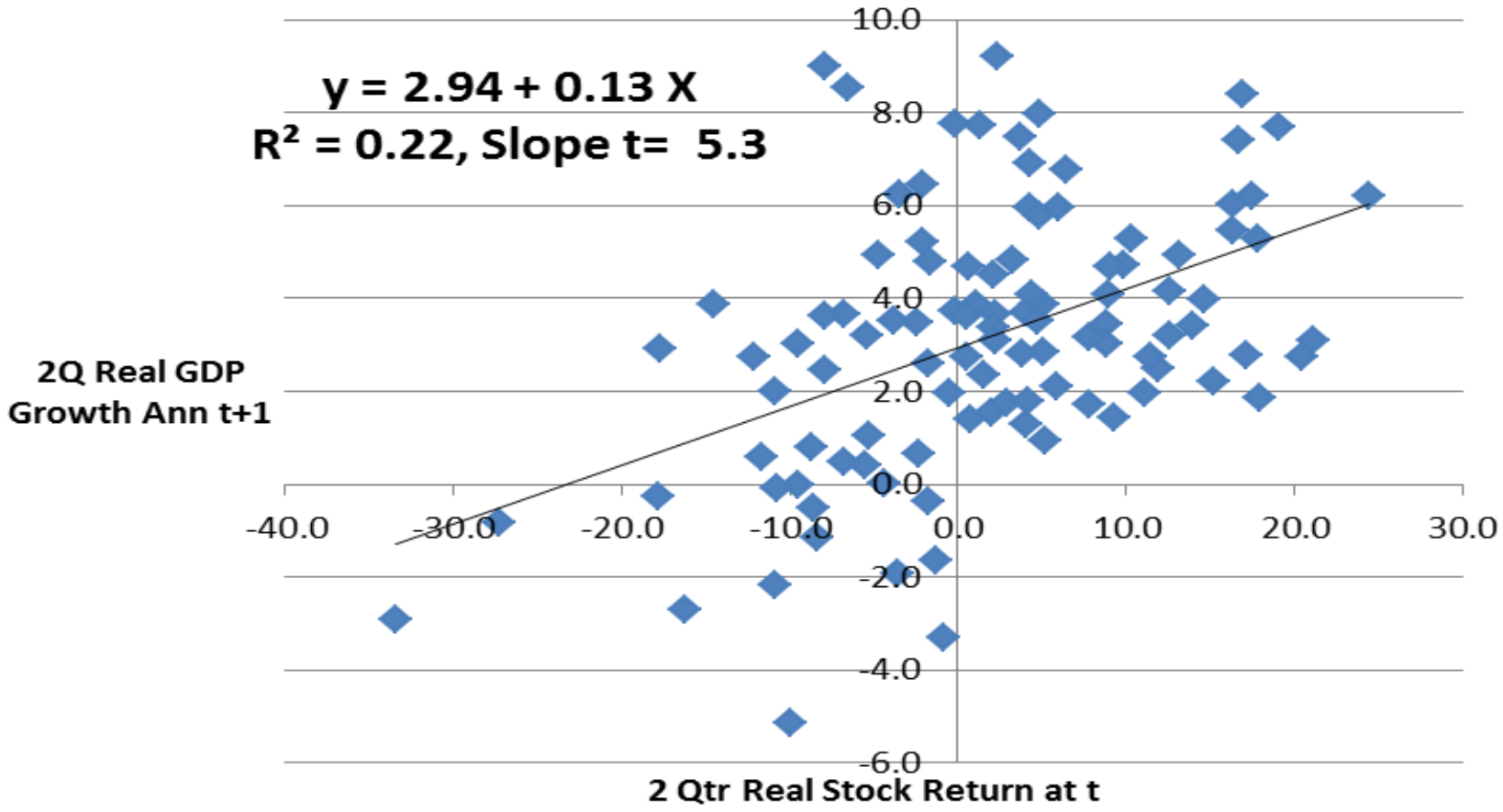
Real Profit Growth Strongly Related to Real GDP Growth

Semiannual 2Q Pct Changes 1960-2013Q2

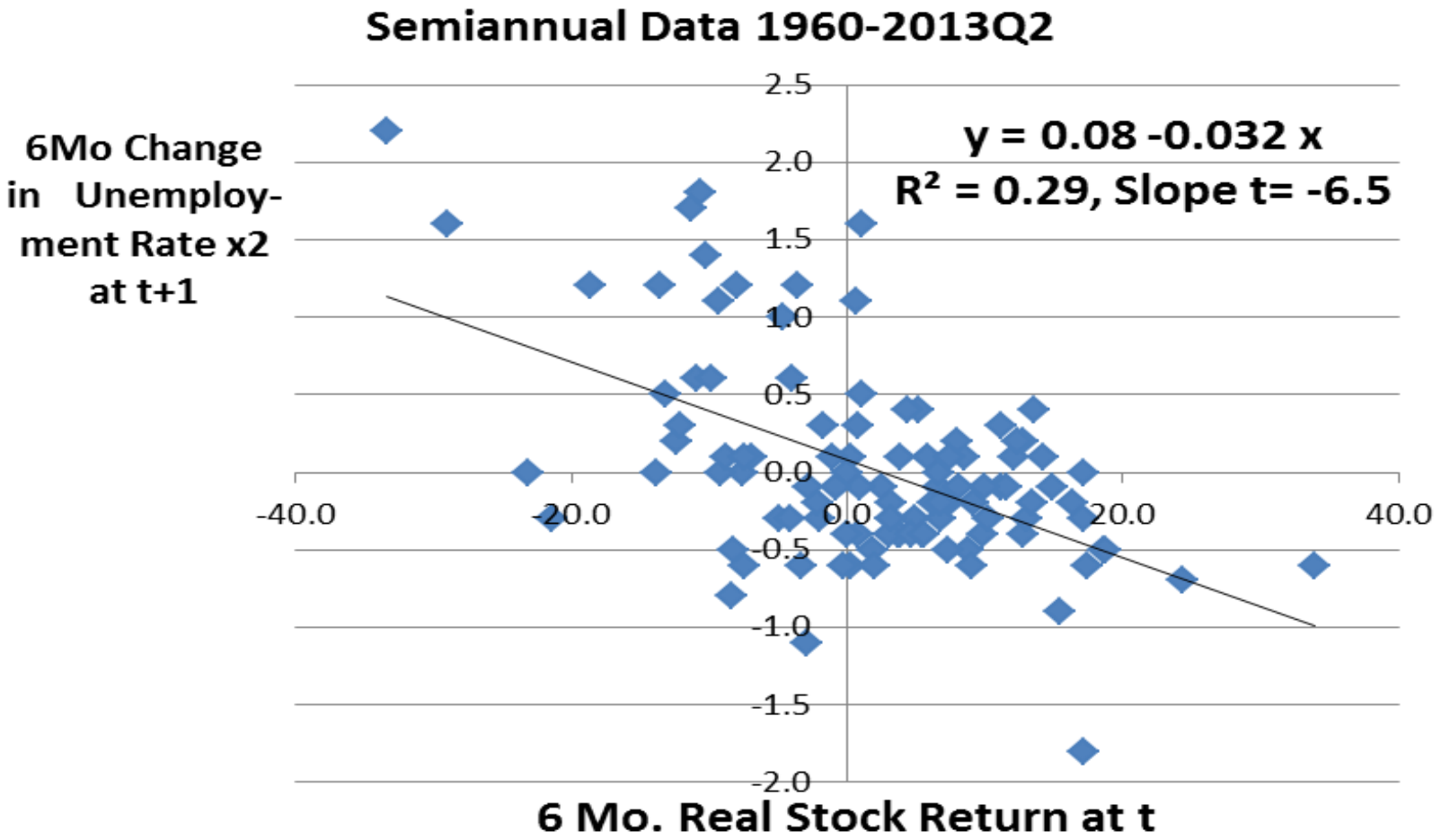


Real Stock Returns Strongly Lead Next 2-Quarters Real GDP Growth

Semiannual Data 1960-2013Q2



Real Stock Returns Strongly Lead Unemployment Rate Changes



Summary on Stock Market Returns and the Economy

- Stock market returns are a leading indicator. They are even more related to economic growth to come in the next 2 quarters than to current real economic growth. Stock prices are always looking forward. Stock prices reflect forecasted earnings growth, which is closely related to forecasted real GDP growth.

- Similar results for stocks and changes in the unemployment rate. When stocks go up sharply, the unemployment rate tends to fall in the next 6 months.

B. Bond Market: The Slope of the Term Structure of Interest Rates Predicts Economic Growth

Economic Growth and the Term Structure of Interest Rates

- Basic Economic Insights About Interest Rates and Growth

1. High real interest rates penalize borrowing and induce individuals to reduce consumption, save, and have more to consume later. Lower consumption today, coupled with more later, gives higher consumption growth associated with higher rates.

$$r \uparrow \quad \Rightarrow \quad C_{Today} \downarrow, C_{Future} \uparrow \quad \Rightarrow \quad \text{C-growth rate} \uparrow$$

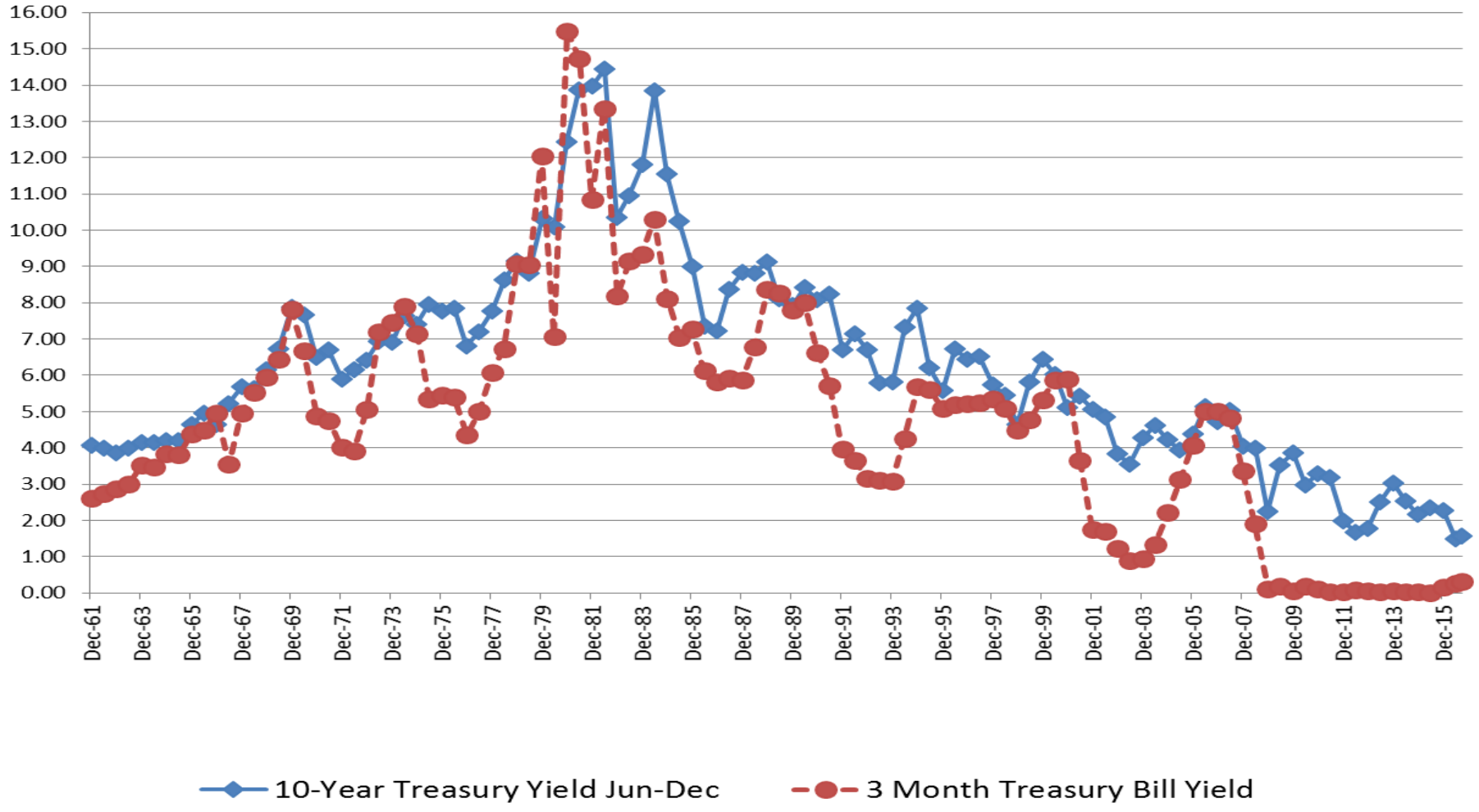
2. Normal risk aversion implies that individuals prefer to buy riskless Treasury bills and bonds more when volatility is high. This "flight to quality" pushes up Treasury bond prices when volatility is high, bringing rates down.

$$\sigma_C \uparrow \quad \Rightarrow \text{Riskless bond prices} \uparrow \Rightarrow \quad \text{Interest rates} \downarrow$$

3. Countries whose individuals have higher "impatience to consume" (like the USA) should have higher rates, whereas countries with more patient savers (like Japan) should have lower rates.

Fifty-five Years of 10-Year & 3-Month U.S. Treasury Yields:

Semiannually Dec 31 1961 to June 30 2016 & September 1 2016

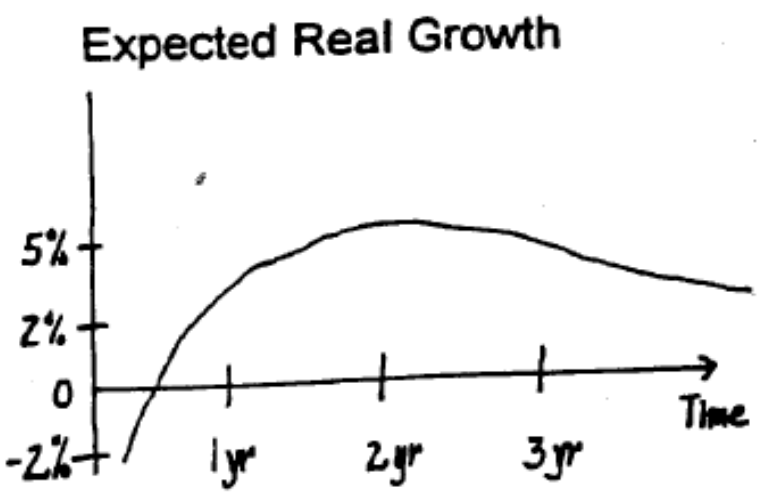


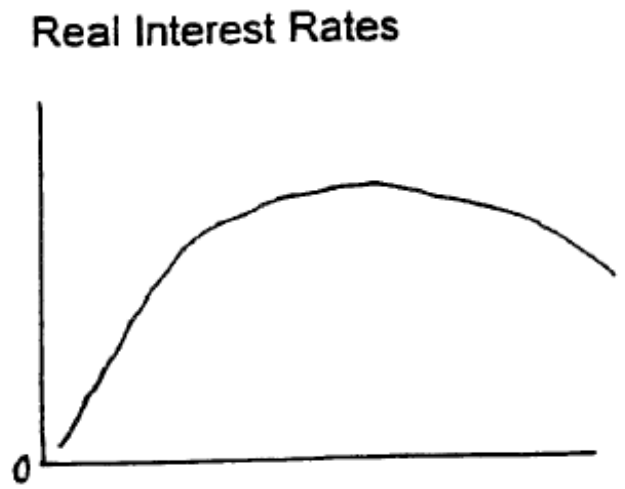
Let's Use the Fact That Higher Growth Should Be Associated with Higher Real Interest Rates in Equilibrium

<u>At the bottom of a recession, forecasting better growth to come:</u>

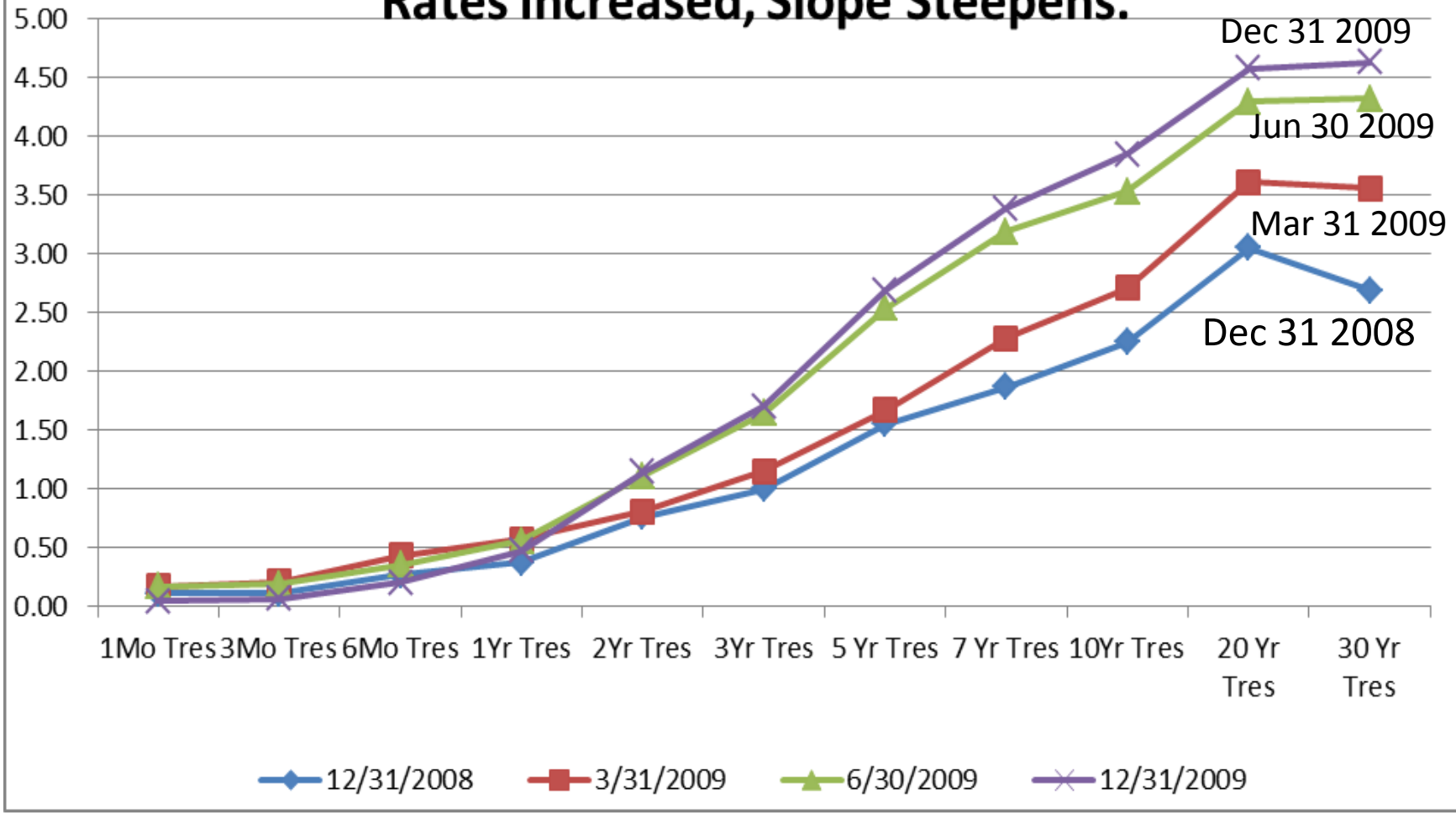
When current, short-term growth is negative, (real) interest rates should be low, possibly even negative. But since long-term growth looks better, long-term interest rates should be higher.

The "slope" of the yield curve is the difference between long-term yields and short-term yields, and it should be high (steep) when markets think we are coming out of a recession.





Term Structure of Interest Rates as Stock Market Improved Sharply March 9-Dec 31, 2009: Rates Increased, Slope Steepens.

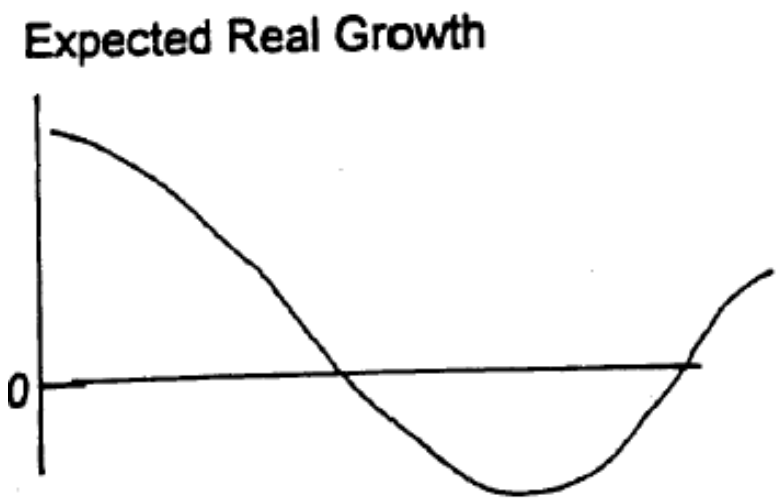


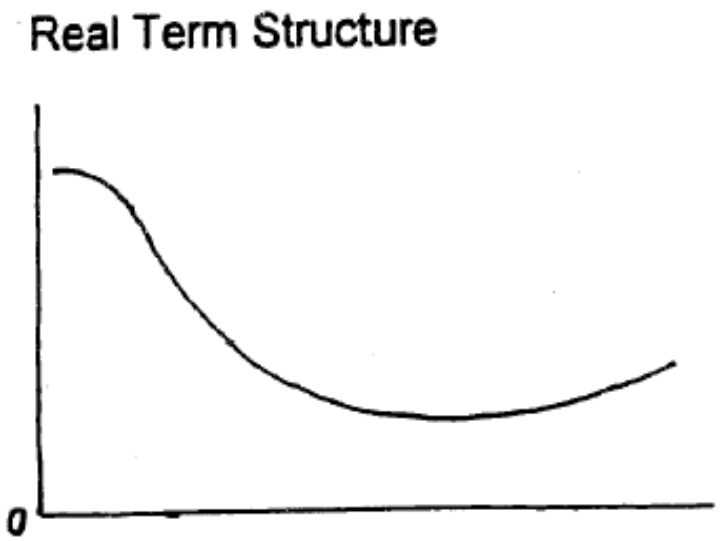
At a Peak, Anticipating Recession

(or slower growth)

Current rapid short-term growth should be associated with high short-term rates. If markets forecast slowing or negative longer term growth, long-term rates should be relatively lower.

High short-term rates and low long-term rates give an "inverted yield curve" with a low or negative slope.

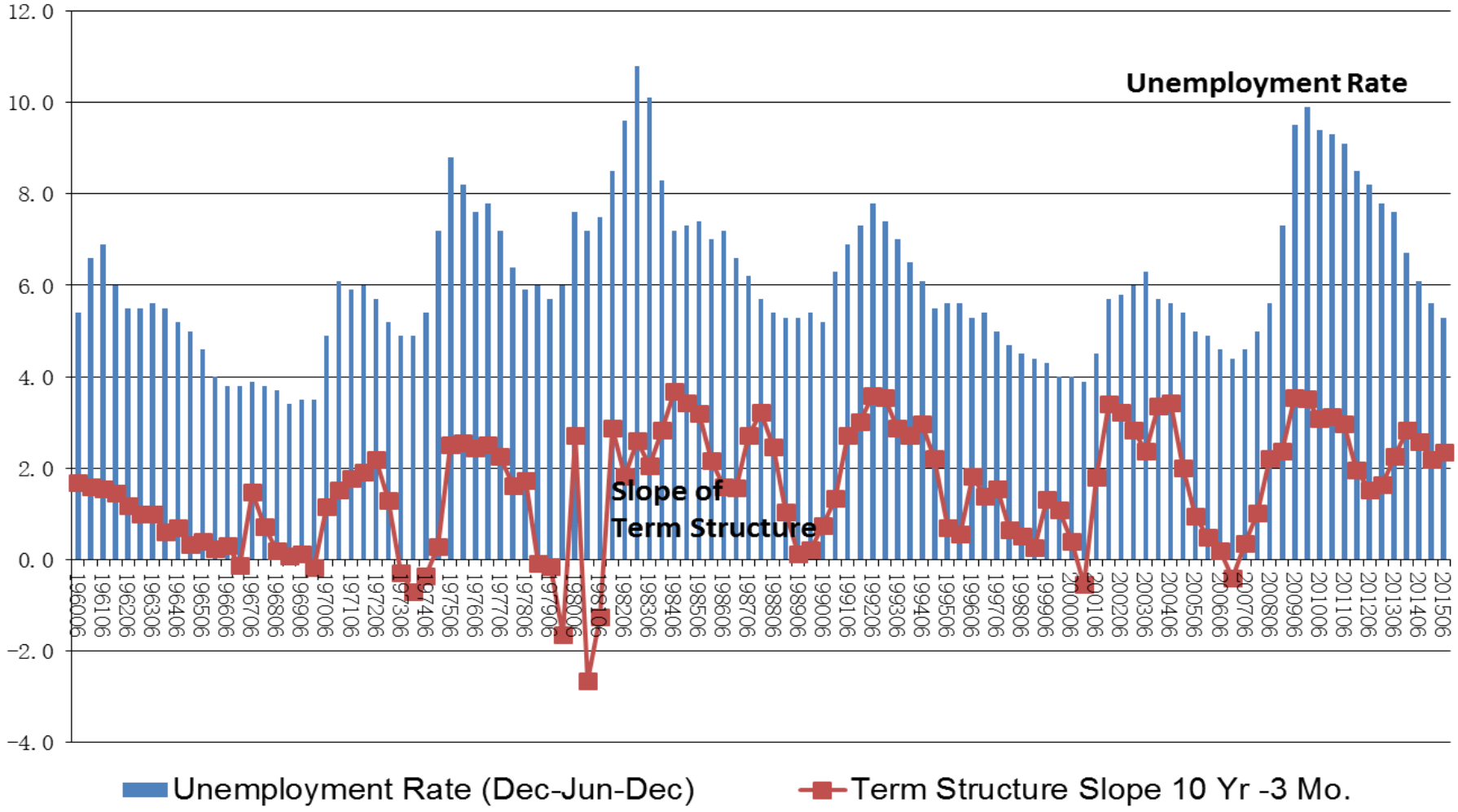


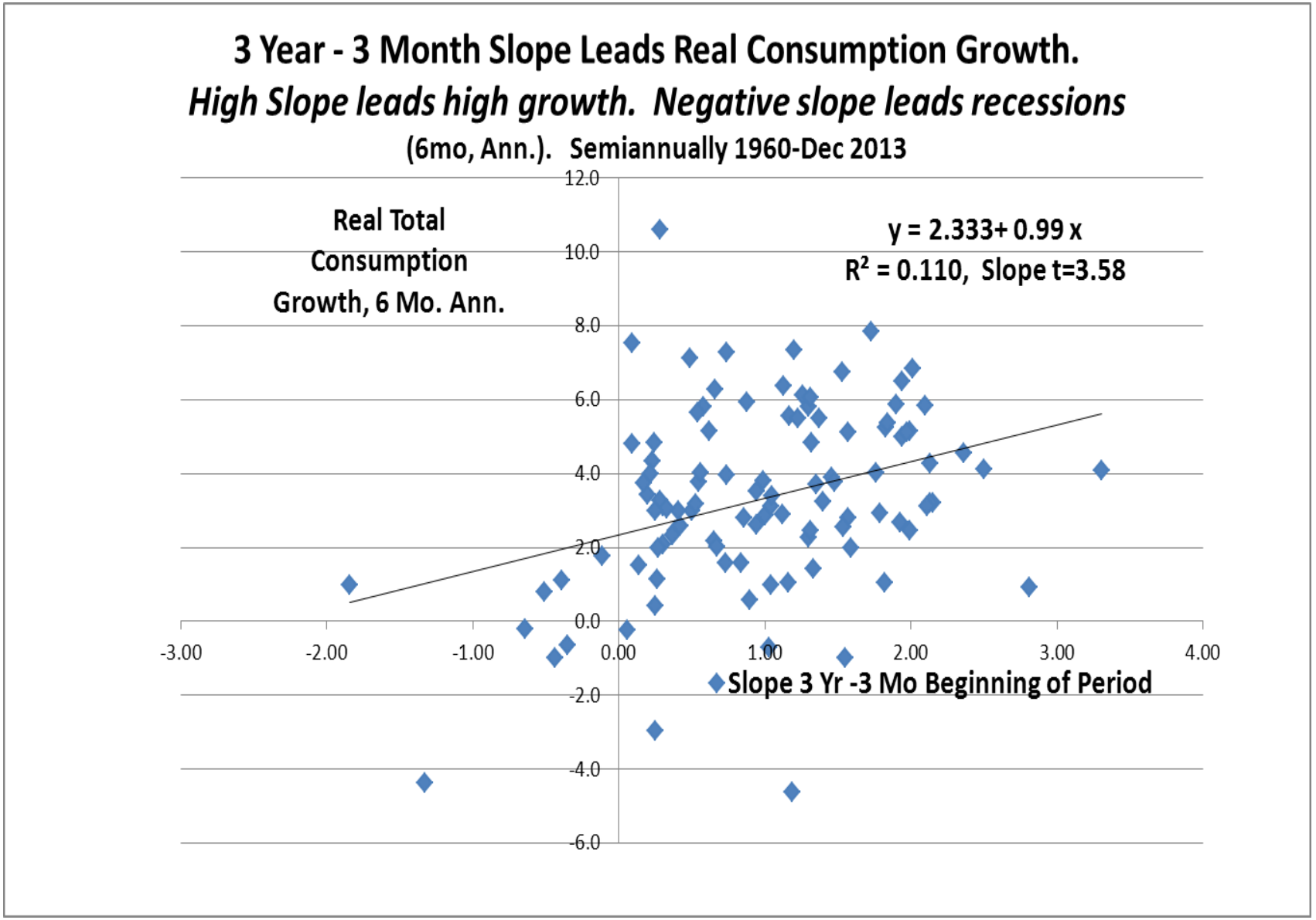


Term Structure Slope (10Yr-3Mo) and Unemployment Rate

Semiannual Data 1960-2015Q2

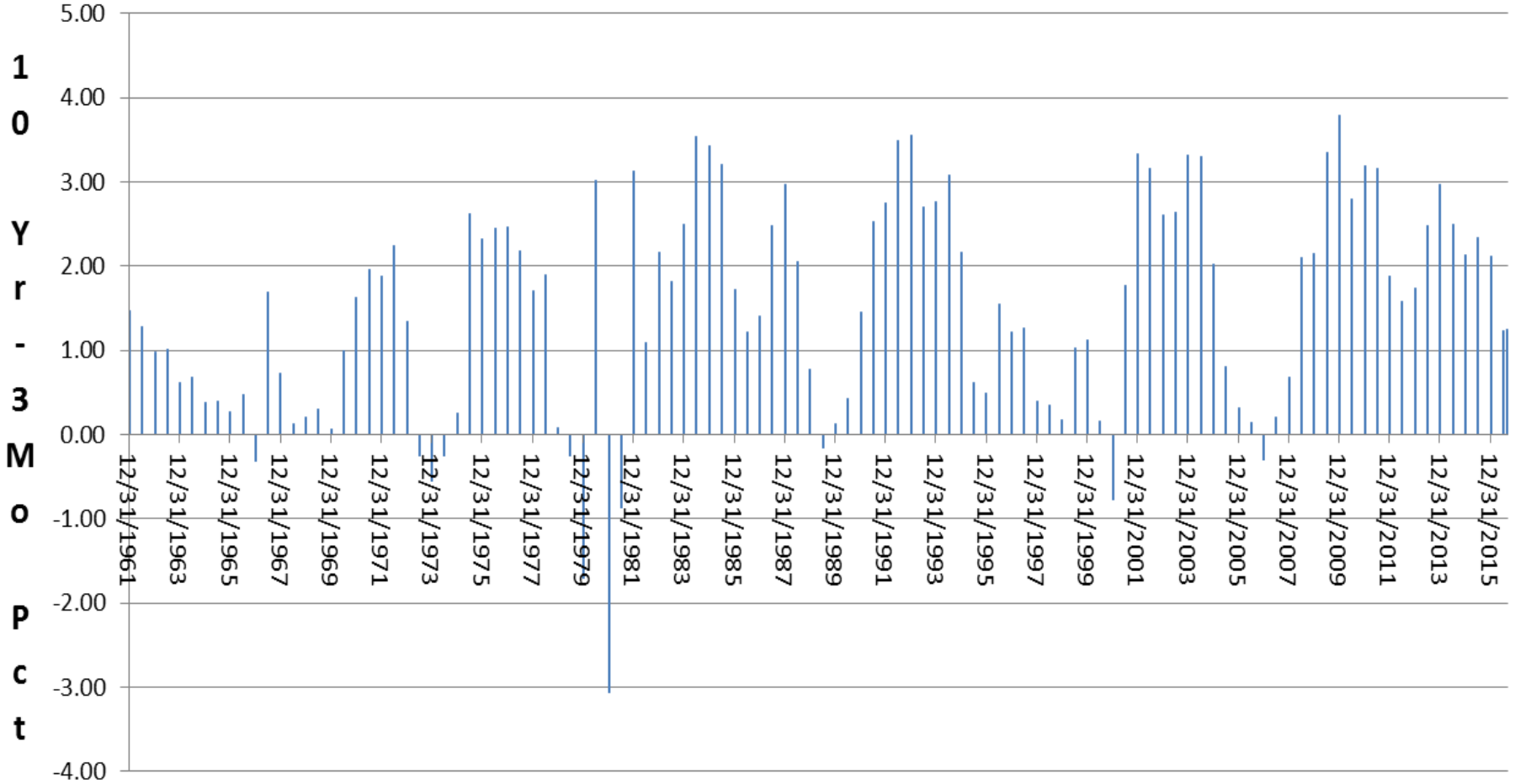
Negative Slope, Recession Usually Follows





U.S. Treasury Yield Curve Slope (10 Yr -3 mnth), 1961-Sept 1 2016

Slope has flattened to normal levels. Neutral on growth.



Usage: The Bond Market's Slope of the Term Structure of Interest Rates Forecasts Economic Growth

- Duke Professor Campbell Harvey (in papers published from 1988 to 1991) tested the model and found the slope to forecast economic growth better than many professional economists, using data from the G-7 countries.

- In 1996, the slope of the term structure of interest rates (10-year rate – 3 month rate) was added to the index of leading economic indicators.

- Harvey even found over his sample period (1950-1989) that the term structure slope did better than the stock market at forecasting growth over the next 4 quarters. The stock market is highly volatile, while the slope is much slower moving.

- In the USA, Post-Brexit July 2016 slope flattened to a long-term normal level, forecasting on-trend growth.

Emerging Markets: Sovereign Credit Spreads

1. The slope of the term structure is not useful as a forecaster for emerging markets, as a steep slope may be a negative indicator of credit concerns and a poor economy, which goes opposite the normal positive steep slope signal in low risk countries.

2. A country's likelihood of default depends upon its economic growth. Recessions increase default risk.

3. When bond investors are worried about a country's economic growth or see recession conditions in the next year, the country's bond prices fall and the required return increases on its borrowings.

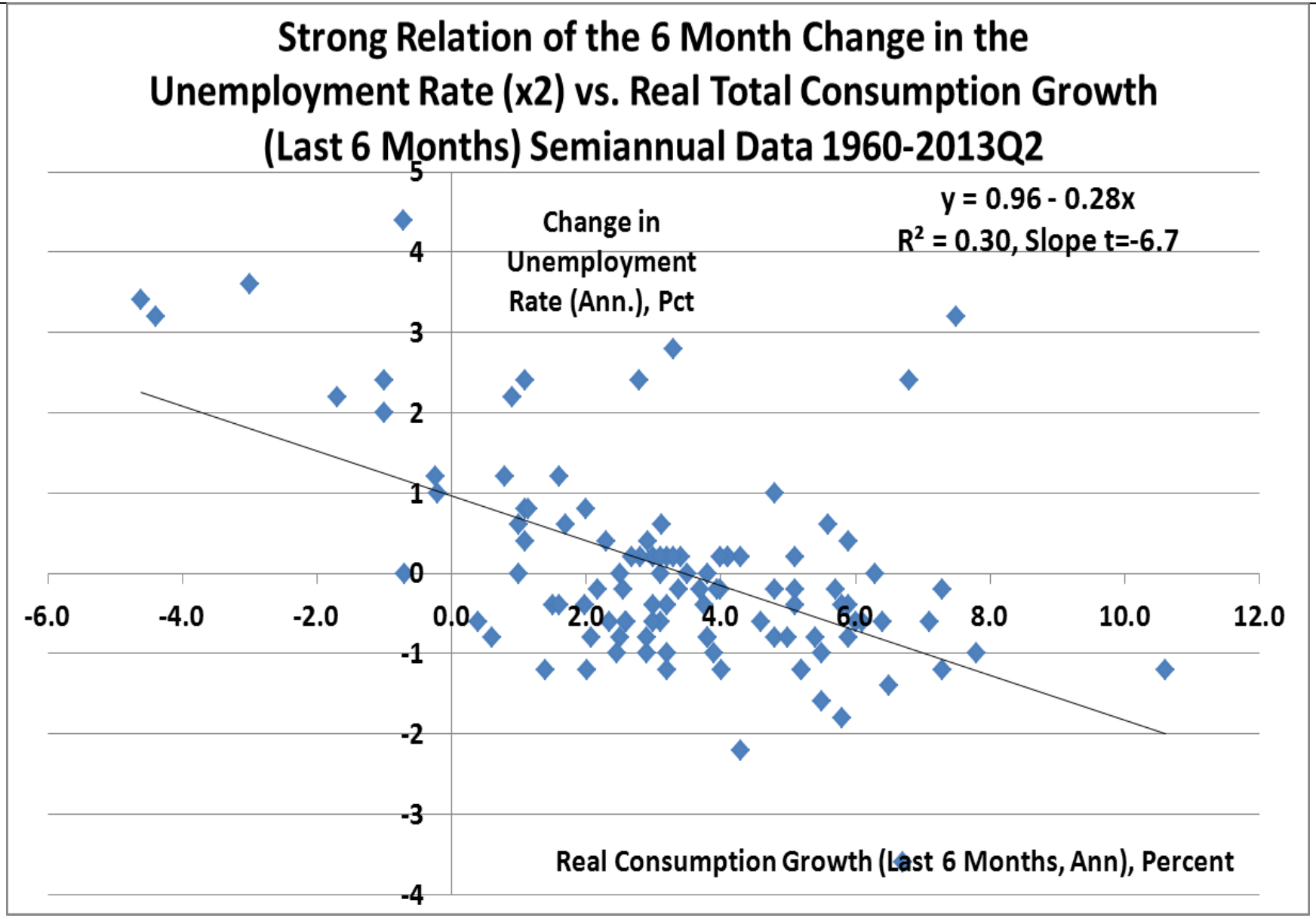
4. For emerging markets, the sovereign credit spread to the USA yield of comparable maturity is used as the bond market's signal for a country's growth prospects. Widening yield spreads are a predictor of poor growth or recession. Narrowing spreads are positive indicators of good growth.

C. Consumption Deviations from Wealth Predict Income and Investment Opportunities

- Following Merton (1973) and Rubinstein (1976), Breeden (1979, 1984) studied optimal consumer spending in a model where consumers plan their lifetime consumption and investments. Investors' consumption levels largely depend upon wealth, income (jobs and wages) and investment opportunities (risk and return).

- Consumption fluctuations with wealth effects eliminated should be indicators of job and wage prospects and the attractiveness of investments.

- This consumer spending indicator of the future job and income prospects can be combined with stock market returns and term structure slope as indicators to get an improved leading index for the economy.

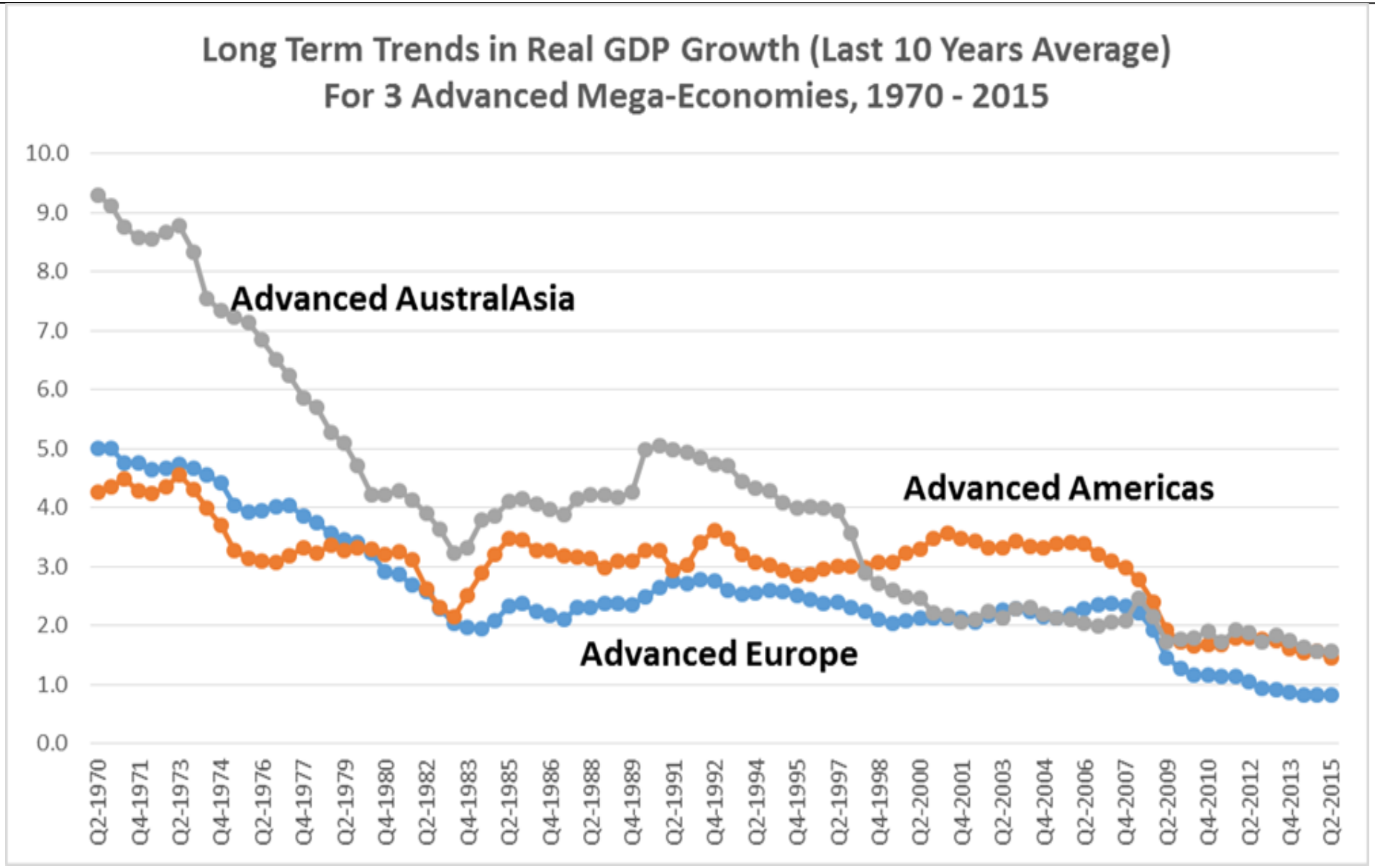


C. Consumption Spending Reflects Wealth, But Also Knowledge About Future Jobs, Income Growth and Investment Opportunities

We can extract information that consumers have about future economic growth by eliminating the stock market wealth effect from spending growth.

17 Trillion Dollar Economies; 3 Global Mega-Economies

1. Europe	GDP Forex $	GDP PPP $	2. Asia and Australia	GDP Forex $	GDP PPP $	3. Americas	GDP Forex $	GDP PPP $
Germany	$3.5	$4.0	**China**	$11.0	$21.6	**U.S.A.**	$18.5	$18.5
U.K.	2.8	2.8	**Japan**	4.5	4.9	**Brazil**	1.6	2.5
France	2.5	2.7	**India**	2.2	8.5	**Mexico**	1.1	2.3
Russia	1.2	3.8	**South Korea**	1.4	2.0	**Canada**	1.5	1.7
Italy	1.9	2.2	**Indonesia**	0.9	3.0			
Spain	1.2	1.7	**Australia**	1.2	1.2			
Turkey	0.7	1.7						
Total	**$13.8**	**$18.9**	**Total**	**$21.2**	**$41.2**	**Total**	**$22.7**	**$25.0**



Removing the Wealth Effect from Consumption in 3 Mega-Economies:

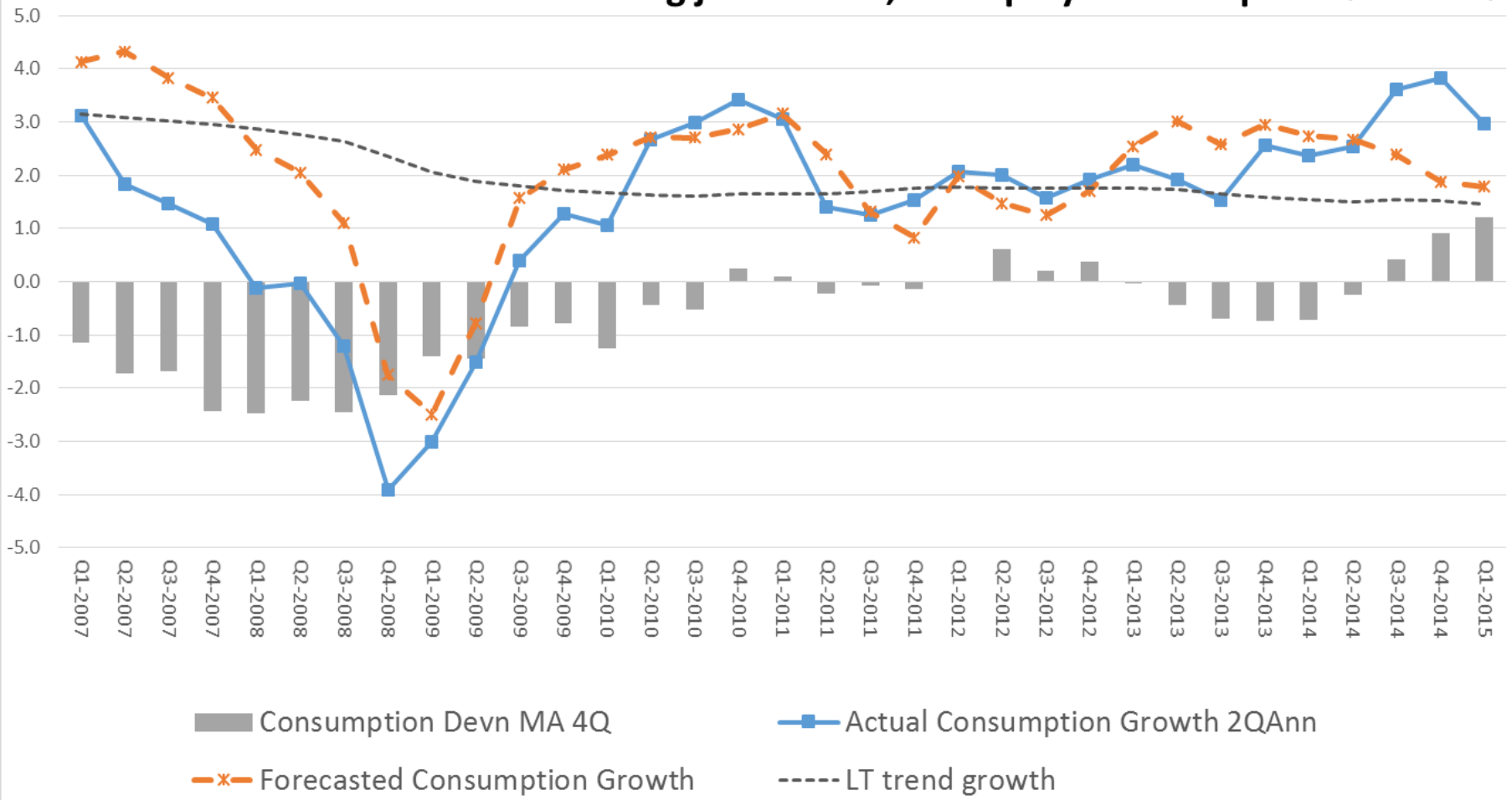
Real Consumption Growth Predicted by Stock Returns

2 Quarter Changes (Q2-Q4-Q2). 54 Years: 1961Q2 – Q4/2014

Dependent Variable Real Total Consumption Growth (2Q%,Ann)	Real Stock Return 2Q% Current	Real Stock Return 2Q% Lag 1	Real Stock Return 2Q% Lag 2	20 Year Historic Trend Growth RI GDP	Constant	Corr RSQ
Advanced Americas	**0.098**	**0.059**	**0.042**	**1.02**	**-0.37**	**0.39**
1961Q2-2014Q4	**t=6.0**	**t=3.7**	**t=2.6**	**t=4.7**	**t=-0.5**	**N=108**
Advanced Europe	**0.029**	**0.042**	**0.029**	**1.17**	**-0.95**	**0.54**
1961Q2-2014Q4	**t=2.5**	**t=3.6**	**t=2.5**	**t=10.8**	**t=-2.7**	**N=108**
Advanced AusAsia	**0.057**	**0.030**	**0.019**	**0.85**	**-0.60**	**0.55**
1961Q2-2014Q4	**t=3.3**	**t=1.8**	**t=1.1**	**t=10.9**	**t= -1.3**	**N=108**

United States

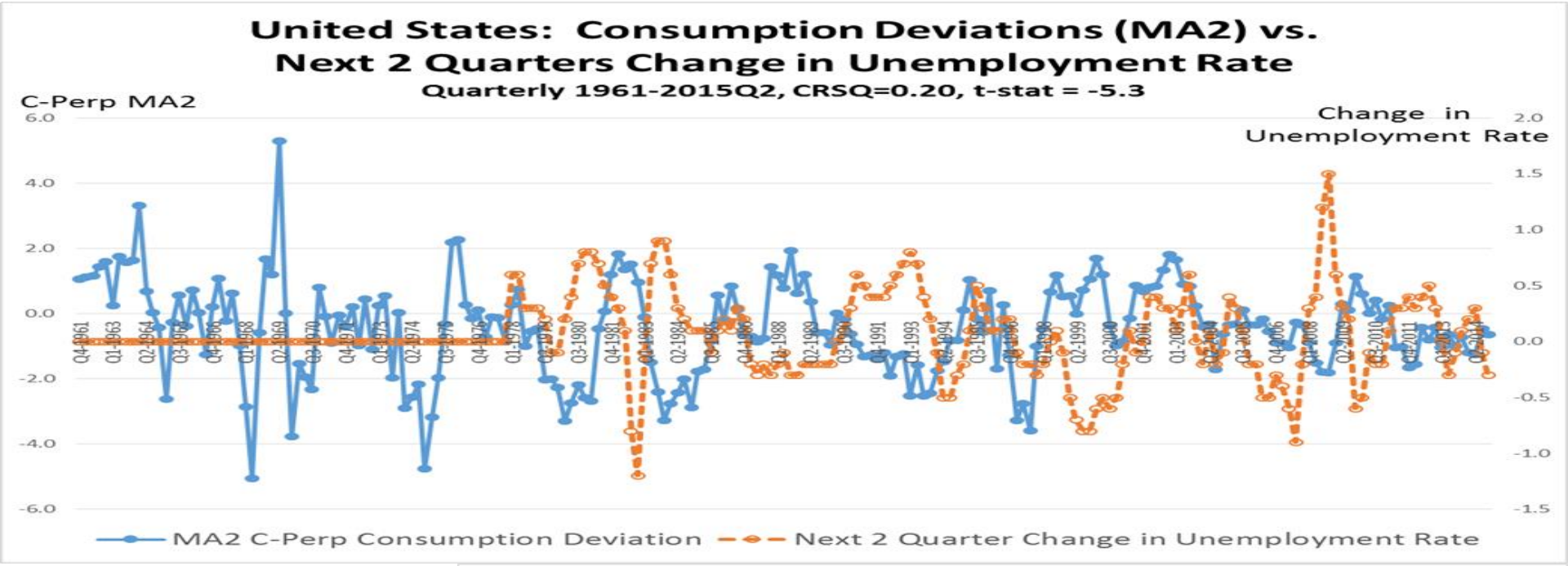
Consumer signal (bar) shows US Consumers were quite negative in 2007, prior to Great Recession. Consumer signal turned positive in 2014-2015. Strong job market, unemployment drop 10.0% to 5.5%.

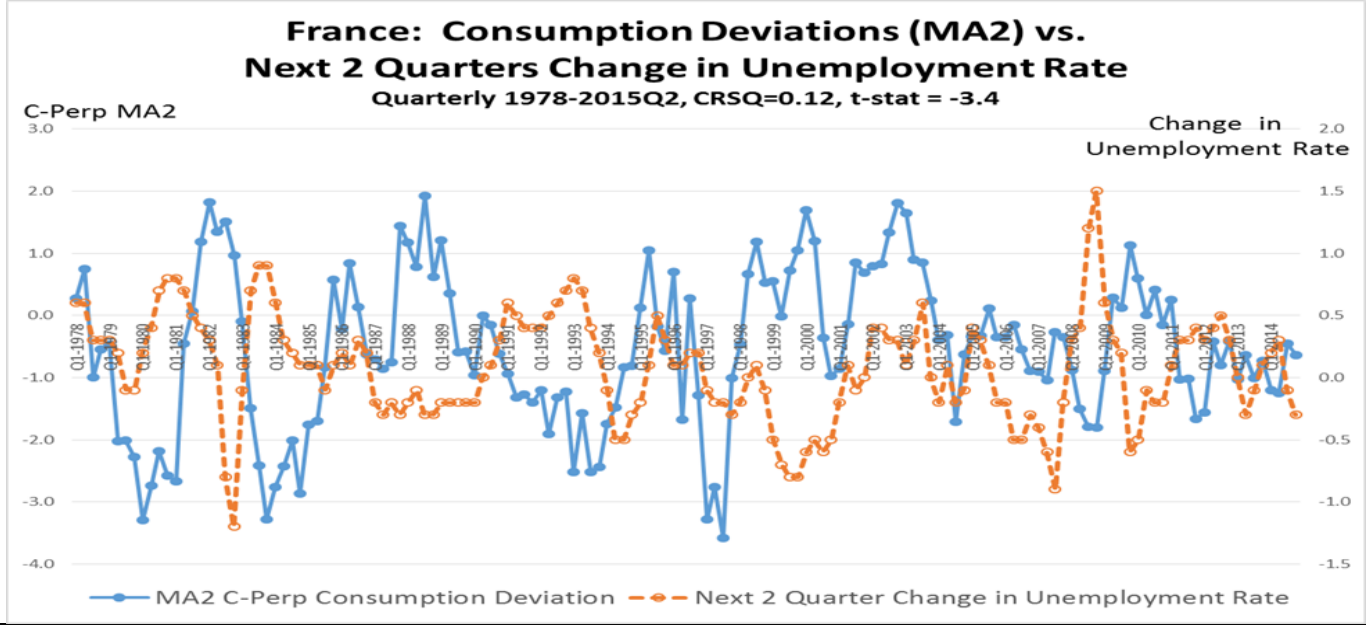


Consumption Growth Deviations and the Income and Investment Opportunity Set

- The lagged values of the residuals from the above regressions are examined for predictive ability with regard to income, wages, jobs and other macro variables.

- Specifically, we regress the growth rate of each variable on its own lag and the lagged consumption residuals, stock returns and term structure slope (reflecting information from the stock market, bond market, and consumers).





Advanced Americas: GDP, Employment Related to Stock Returns, Term Structure Slope, Consumption Deviations

Note: Coefficients of Trend and Lagged dependent variable not shown

Variable (Y_t)	Real Stock Return Lag 1	Real Stock Return Lag 2	Treas Slope 10y-3m, Lag 1	Total Real Consumption Deviation Lag 1 or *Lag 1,2 Avg	Corr. R^2
Real GDP 2Q Ann%Chg	0.12 (t=6.6)	0.06 (t=3.3)	0.73 (t=4.2)	0.36 (t=3.1)	0.56
Unemploymt Rate* 2Q Change	-0.031 (t=-9.2	-0.013 (t=-2.9)	-0.15 (t=-4.6)	-0.09* (t=-3.1)	0.70
Total Employmnt* 2Q Ann%Chg	0.065 (t=6.0)	0.042 (t=3.5)	0.27 (t=2.6)	0.35* (t=3.5)	0.63

Advanced Europe: GDP and Employment Related to Stock Returns, Term Structure Slope and Consumption Deviations

Variable (Y_t)	Real Stock Return Lag 1	Real Stock Return Lag 2	Treas Slope 10y-3m, Lag 1	Total Real Consumption Deviation Lag 1 or *Lag 1,2 Avg	Corr. R^2
Real GDP 2Q Ann%Chg	0.069 (t=6.0)	0.031 (t=2.7)	0.45 (t=3.2)	0.49 (t=4.7)	0.60
Unemploymt Rate 2Q Change	-0.009 (t=-4.4)	-0.005 (t=-2.2)	-0.056 (t=-2.3)	-0.074 (t=-3.6)	0.60
Total Employmnt 2Q Ann%Chg	0.022 (t=3.1)	0.016 (t=2.3)	0.15 (t=1.7)	0.19 (t=2.8)	0.54

Advanced AustralAsia: GDP, Employment Related to Stock Returns, Term Structure Slope, and Consumption Deviations

Variable (Y_t)	Real Stock Return Lag 1	Real Stock Return Lag 2	Treas Slope 10y-3m, Lag 1	Total Real Consumption Deviation Lag 1 or *Lag 1,2 Avg	Corr. R^2
Real GDP 2Q Ann%Chg	0.078 (t=3.5)	0.007 (t=0.3)	-0.01 (t=-0.0)	0.28 (t=2.4)	0.45
Unemploymt Rate* 2Q Change	-0.0054 (t=-4.0)	-0.0037 (t=-2.6)	-0.014 (t=-0.8)	-0.018* (t=-1.9)	0.29
Total Employmnt YoY %Chg	0.013 (t=3.5)	0.013 (t=3.2)	0.036 (t=0.7)	0.052 (t=2.6)	0.63

Conclusion on Consumption Deviations and Job and Income Opportunities

- Test results show that, as consumption and portfolio theory predict, consumption choices do reflect knowledge about future income and investment opportunities.
- High consumption relative to wealth is usually followed by high wage and personal income growth, and by higher employment growth and lower unemployment. Low consumption/wealth reflects weak income and job opportunities.
- Consumption deviations from wealth are a leading indicator.

Breeden's SBCLI©:

A Stock, Bonds, Consumers Leading Indicator

Standardized Z-Scores for Real Stock Returns, Term Structure Slope, & Consumption Deviations

- For key variable k (k = Stocks return, bond slope, consumer deviation) at time t:

- $Z_{kt} = \frac{(x_{kt} - \mu_k)}{\sigma_k}$

For a normal distribution, Abs(Z)>1 about 1/3 time, Abs(Z) >2 about 5% time

Scaled Coefficients from Regressions with Z-Scores (1962 Q2 or 1963 Q2 to 2011Q2)

Scaled so that total stock market effect has coefficient = 1.0

	Advanced Americas				Advanced Europe				Advanced AustralAsia			
	Lg1Stocks	Lg2Stocks	Lg1Slope	Lg1CPerp	Lg1Stocks	Lg2Stocks	Lg1Slope	Lg1CPerp	Lg1Stocks	Lg2Stocks	Lg1Slope	Lg1CPerp
Scaled Coefficients Relative to Total Stock Market Coefficient												
Real GDP Growth	1.00		0.48	0.34	1.00		0.39	0.54	1.00		-0.03	0.63
Industrial Production	1.00		0.48	0.21	1.00		0.58	0.43	1.00		0.43	0.65
Unemployment Rate Change	1.00		0.40	0.36	1.00		0.38	0.72	1.00		0.12	0.38
Employment Growth	1.00		0.30	0.56	1.00		0.39	0.61	1.00		0.08	0.42
Average Scaled Coefficients	**1.00**		**0.41**	**0.37**	**1.00**		**0.43**	**0.57**	**1.00**		**0.15**	**0.52**

Grand Means of Scaled Coeffs	**1.00**	**0.33**	**0.49**
	Stocks	**Slope**	**Cperp**

Stocks, Bonds, Consumers Leading Index (SBCLI)

- Using data from Advanced Americas, Advanced Europe and Advanced AustralAsia, found major macro variables most related to lagged stock returns, with weight on Z-score for stocks about 2x that for term structure slope and for consumption deviations.

- Simple Stocks, Bonds, Consumers (SBCLI) index proposed is (for advanced economies):

SBCLI = 2*Z(RlStock) + 1*Z(Slope) + 1* Z(Cons Dev'n)

Stocks, Bonds, Consumers Leading Indicator (SBCLI©)

United States

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September, 2015

	RlStock	Slope	Cperp
Mean2Q*D	1.5	1.52	0.00
StdDev2Q	10.9	1.22	0.93

Real Consumption Growth From 2Q Stock Returns

Const	Trend	RlStock.1	Lg1Stok	Lg2RlStok
-0.29	1.00	0.093	0.058	0.041

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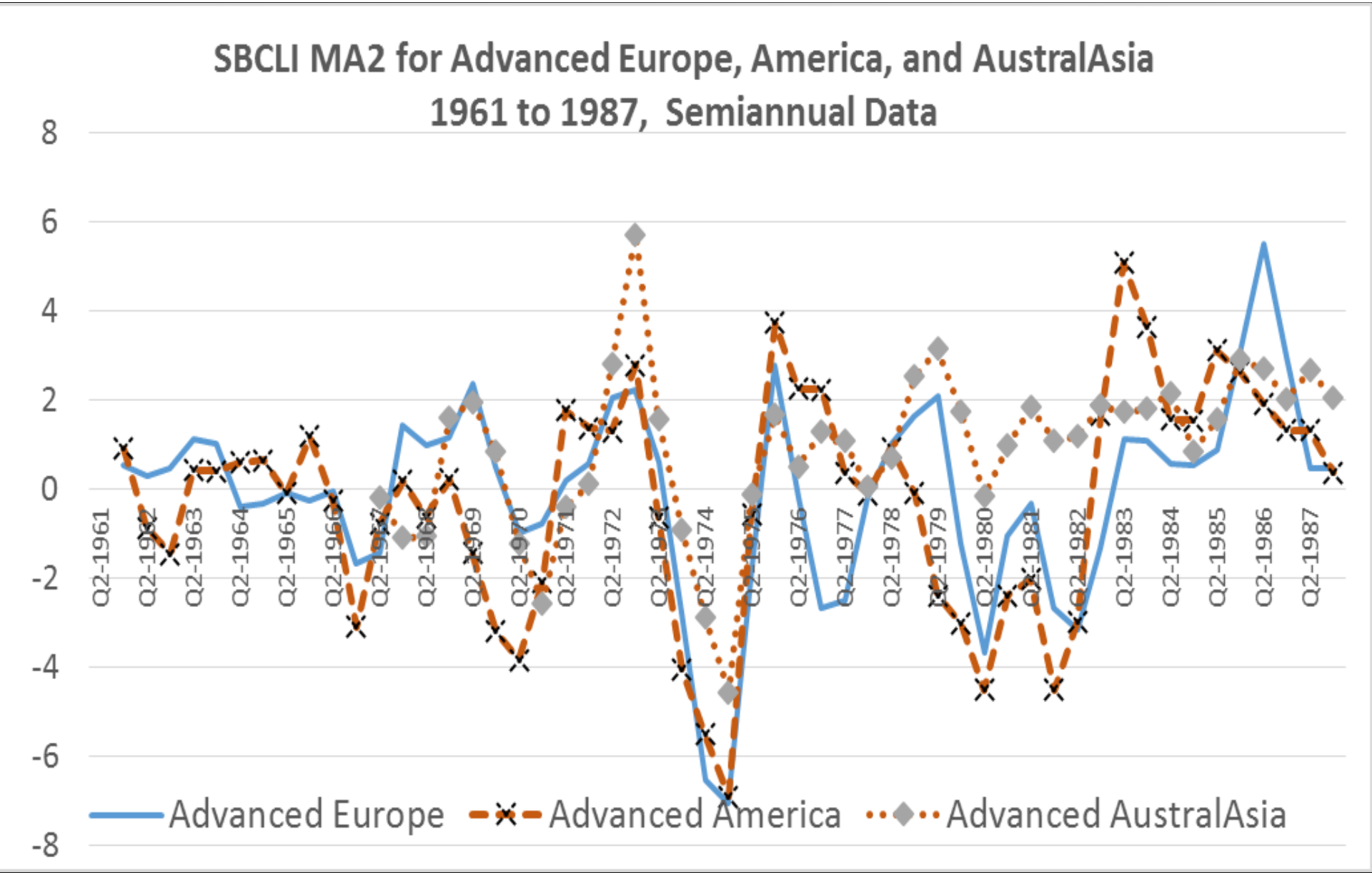
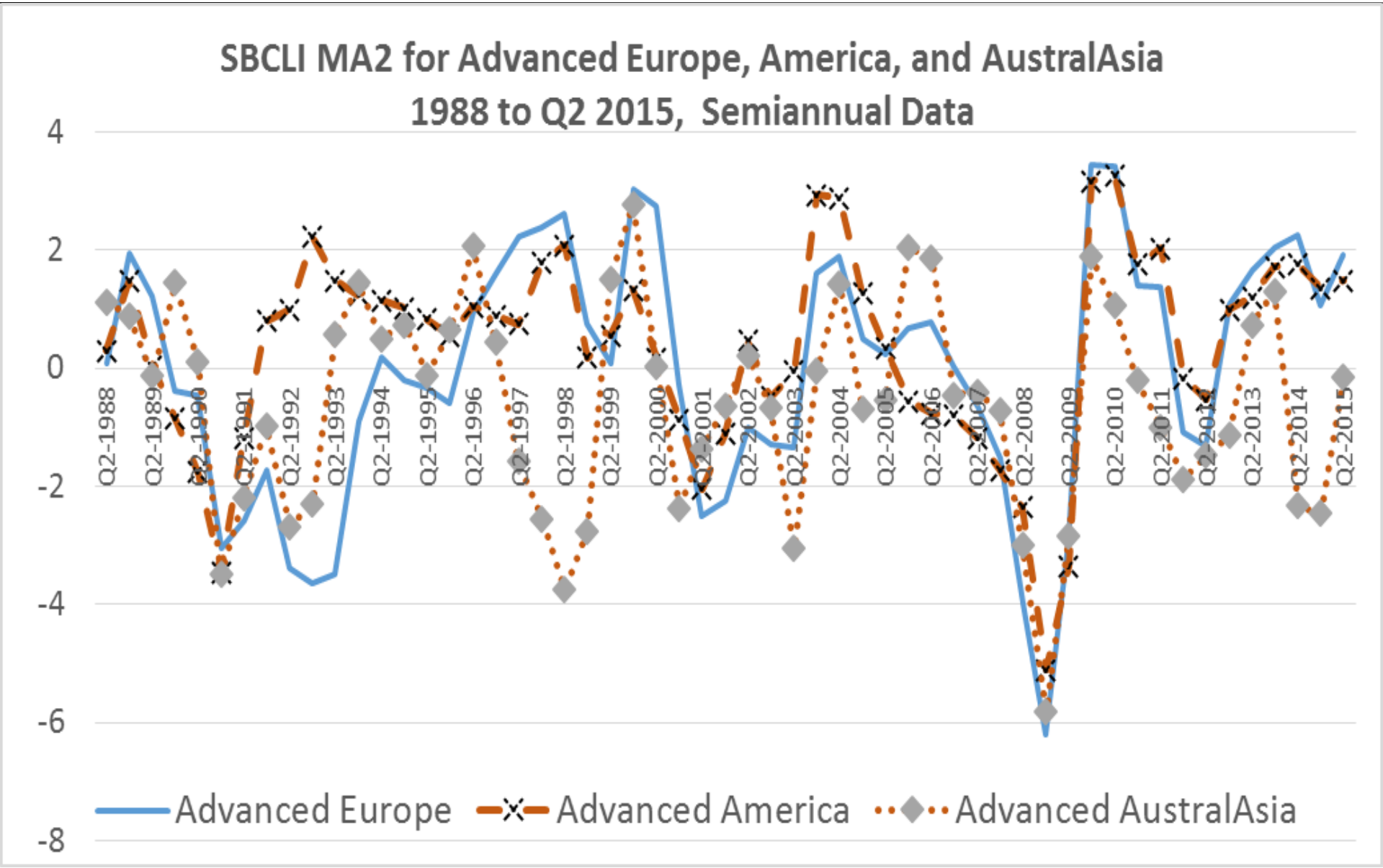
Consumer Z Multiplier =	1
Correlations Fcst Next 2Q	
SBCLI Corr=	0.70
SBCLI MA2=	0.77
Correlations Fcst Next 4Q	
SBCLI Corr=	0.72
SBCLI MA2=	0.74

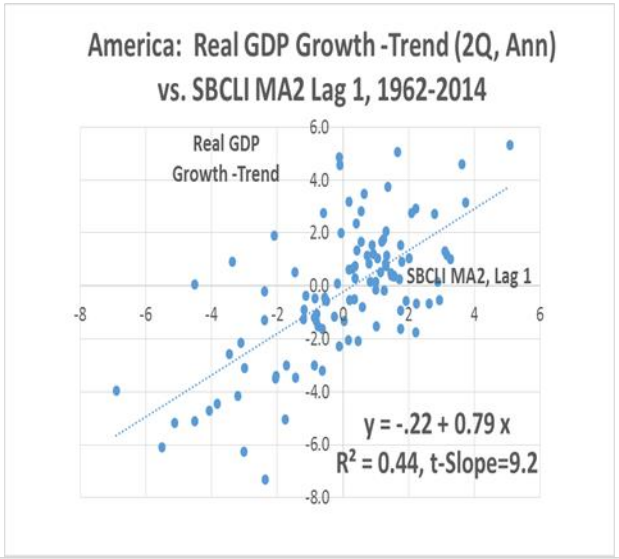
Bond Z Multiplier =	1		
Real GDP	IndProd	Employ	dUempl
0.61	0.78	0.63	-0.76
0.65	0.75	0.82	-0.87
0.66	0.70	0.74	-0.76
0.63	0.64	0.83	-0.83

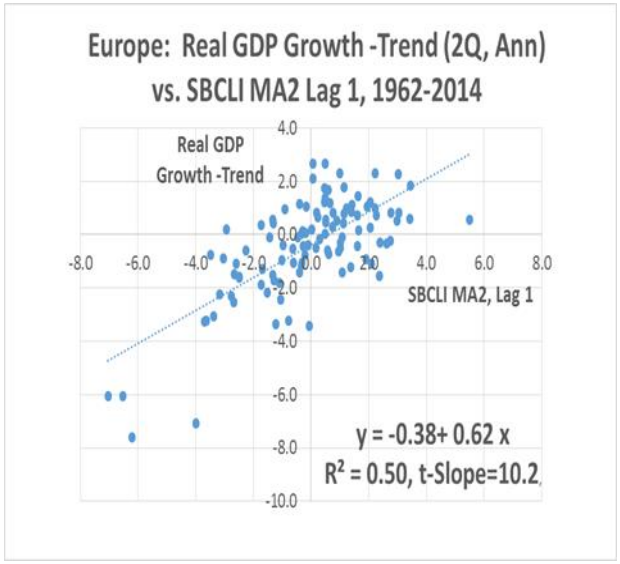
	Stock Market				Bond Market				Consumers					SBCLI		Macroeconomic Data			
	Stock Index	Inflation	Real Stock Return	Stocks	Long Treasury yield	Short Treasury yield	Yield Curve Slope	Bonds Z-Score	Actual Consumption Growth	10Yr Trend RI GDP	Forecasted Consumption Growth	C-Perp	Consumer	Stocks, Bonds (1,0), Consumers	MA2 Stocks, Bonds Consumer	Real GDP growth	Industrial Production	Employment growth	Unemployment rate
	2010=100	(YoY, %)	Last2Qtrs	2xZscore	Bond Z Multiplier =			1	Consumer Z Multiplier=			1	Z score	Total Zscore	Total Zscore	(2Q,Ann%)	2Q,Ann%)	2Q,Ann%)	(%)
Q4-2006	122.7	1.9	6.7	1.0	4.63	5.03	-0.40	-1.6	3.2	3.2	4.1	-1.0	-1.1	-1.7	-1.3	1.7	1.2	2.1	4.4
Q1-2007	127.3	2.4	10.0	1.6	4.68	5.12	-0.44	-1.6	3.1	3.2	4.1	-1.0	-1.1	-1.1	-2.0	1.7	2.2	2.2	4.5
Q2-2007	135.0	2.7	8.6	1.3	4.85	4.87	-0.03	-1.3	1.8	3.1	4.3	-2.5	-2.7	-2.6	-2.2	1.7	4.2	0.3	4.5
Q3-2007	134.7	2.4	4.6	0.6	4.73	4.42	0.31	-1.0	1.5	3.0	3.8	-2.4	-2.6	-3.0	-2.1	2.9	3.0	-0.3	4.7
Q4-2007	137.0	4.0	-0.5	-0.4	4.26	3.47	0.79	-0.6	1.1	3.0	3.5	-2.4	-2.6	-3.5	-3.1	2.1	1.0	0.6	4.8
Q1-2008	124.5	4.1	-9.4	-2.0	3.66	2.12	1.54	0.0	-0.1	2.9	2.5	-2.6	-2.8	-4.8	-3.9	-0.6	-0.2	0.4	5.0
Q2-2008	127.3	4.4	-9.1	-1.9	3.89	1.64	2.25	0.6	0.0	2.8	2.1	-2.1	-2.3	-3.6	-3.6	-0.4	-3.4	-0.5	5.3
Q3-2008	113.9	5.3	-10.9	-2.3	3.86	1.66	2.21	0.6	-1.2	2.6	1.1	-2.3	-2.5	-4.2	-4.5	0.0	-9.1	-1.3	6.0
Q4-2008	79.2	1.6	-38.3	-7.3	3.25	0.39	2.86	1.1	-3.9	2.4	-1.8	-2.2	-2.3	-8.5	-6.1	-5.3	-14.5	-2.5	6.9
Q1-2009	70.5	0.0	-38.1	-7.3	2.74	0.23	2.51	0.8	-3.0	2.1	-2.5	-0.5	-0.6	-7.0	-5.6	-7.0	-18.7	-5.2	8.3
Q2-2009	79.1	-1.2	0.5	-0.2	3.31	0.16	3.15	1.3	-1.5	1.9	-0.8	-0.7	-0.8	0.4	-4.1	-3.0	-16.3	-5.2	9.3
Q3-2009	89.6	-1.6	28.1	4.9	3.52	0.17	3.35	1.5	0.4	1.8	1.6	-1.2	-1.3	5.1	-0.9	0.4	-3.5	-2.9	9.6
Q4-2009	98.0	1.4	23.0	3.9	3.46	0.07	3.39	1.5	1.3	1.7	2.1	-0.8	-0.9	4.6	2.5	2.6	5.6	-2.8	9.9
Q1-2010	99.4	2.4	9.6	1.5	3.72	0.10	3.62	1.7	1.1	1.7	2.4	-1.3	-1.4	1.8	3.4	2.7	7.5	-1.2	9.8
Q2-2010	98.6	1.8	-0.3	-0.3	3.49	0.14	3.35	1.5	2.7	1.6	2.7	-0.1	-0.1	1.1	2.8	2.7	8.5	1.2	9.6
Q3-2010	96.2	1.2	-3.8	-1.0	2.79	0.15	2.64	0.9	3.0	1.6	2.7	0.3	0.3	0.3	1.0	3.3	7.5	1.1	9.5
Q4-2010	105.8	1.3	6.6	0.9	2.86	0.14	2.72	1.0	3.4	1.7	2.9	0.6	0.6	2.5	1.8	2.6	4.0	-0.1	9.5
Q1-2011	114.1	2.1	17.4	2.9	3.46	0.13	3.33	1.5	3.1	1.6	3.2	-0.1	-0.1	4.3	2.3	0.5	2.0	0.1	9.1
Q2-2011	115.3	3.4	7.2	1.0	3.21	0.05	3.16	1.3	1.4	1.7	2.4	-1.0	-1.1	1.3	1.9	0.7	1.8	0.6	9.1
Q3-2011	104.9	3.8	-9.8	-2.1	2.43	0.03	2.40	0.7	1.3	1.7	1.3	0.0	-0.1	-1.4	1.4	1.9	3.2	0.6	9.0
Q4-2011	101.4	3.3	-13.5	-2.7	2.05	0.02	2.03	0.4	1.5	1.8	0.8	0.7	0.8	-1.6	-0.1	2.7	4.6	1.6	8.6
Q1-2012	110.5	2.8	3.9	0.4	2.04	0.06	1.98	0.4	2.1	1.8	2.0	0.1	0.1	0.9	-0.2	3.4	4.6	2.8	8.3
Q2-2012	107.5	1.9	5.0	0.6	1.82	0.09	1.73	0.2	2.0	1.8	1.5	0.5	0.6	1.4	-0.1	1.9	4.4	2.2	8.2
Q3-2012	110.9	1.7	-0.5	-0.4	1.64	0.10	1.54	0.0	1.6	1.8	1.3	0.3	0.4	0.0	0.5	2.0	2.6	0.9	8.0
Q4-2012	114.3	1.9	5.3	0.7	1.71	0.10	1.61	0.1	1.5	1.8	1.7	-0.2	-0.2	0.6	1.0	1.3	2.0	1.5	7.8
Q1-2013	123.1	1.7	10.1	1.6	1.95	0.09	1.86	0.3	1.8	1.8	2.5	-0.7	-0.8	1.1	0.5	1.0	2.6	1.2	7.7
Q2-2013	127.9	1.4	11.1	1.8	2.00	0.05	1.95	0.4	1.9	1.7	3.0	-1.1	-1.2	0.9	0.8	1.5	2.0	0.8	7.5
Q3-2013	131.8	1.6	6.2	0.9	2.71	0.03	2.68	1.0	1.5	1.6	2.6	-1.1	-1.1	0.7	0.9	2.0	1.4	1.3	7.2
Q4-2013	138.8	1.2	7.9	1.2	2.75	0.06	2.69	1.0	2.6	1.6	3.0	-0.4	-0.4	1.7	1.3	3.4	2.7	0.5	7.0
Q1-2014	142.3	1.4	7.2	1.0	2.76	0.12	2.64	0.9	2.4	1.5	2.7	-0.4	-0.4	1.6	1.1	1.4	3.6	1.6	6.6
Q2-2014	147.9	2.1	5.5	0.7	2.62	0.11	2.51	0.8	2.5	1.5	2.7	-0.1	-0.1	1.4	1.5	1.8	4.6	2.4	6.2
Q3-2014	151.1	1.8	5.2	0.7	2.50	0.13	2.37	0.7	3.6	1.5	2.4	1.2	1.3	2.7	2.1	4.4	4.8	1.4	6.1
Q4-2014	148.6	1.3	-0.2	-0.3	2.28	0.13	2.15	0.5	3.8	1.5	1.9	1.9	2.1	2.3	1.9	3.1	4.3	1.9	5.7
Q1-2015	150.2	-0.1	-0.6	-0.4	1.97	0.15	1.82	0.2	3.0	1.5	1.8	1.2	1.3	1.1	1.9	1.3	2.2	2.4	5.6
Q2-2015	153.4	0.0	3.3	0.3	2.17	0.15	2.02	0.4	2.4	1.4	1.7	0.7	0.8	1.5	1.9	2.1	-1.1	1.8	5.4

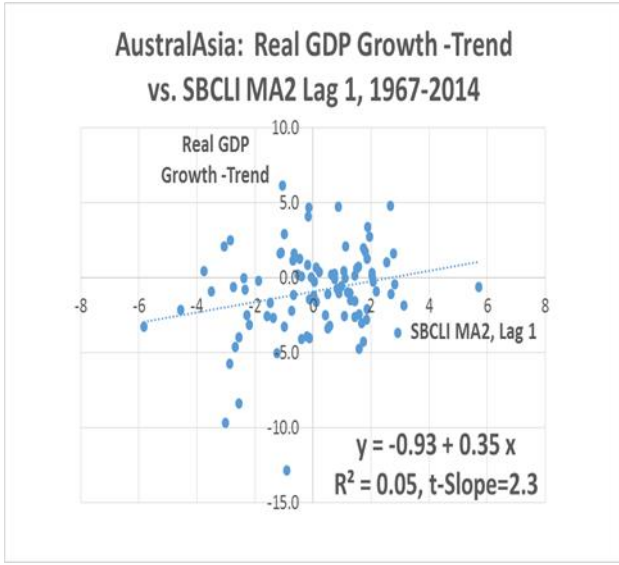


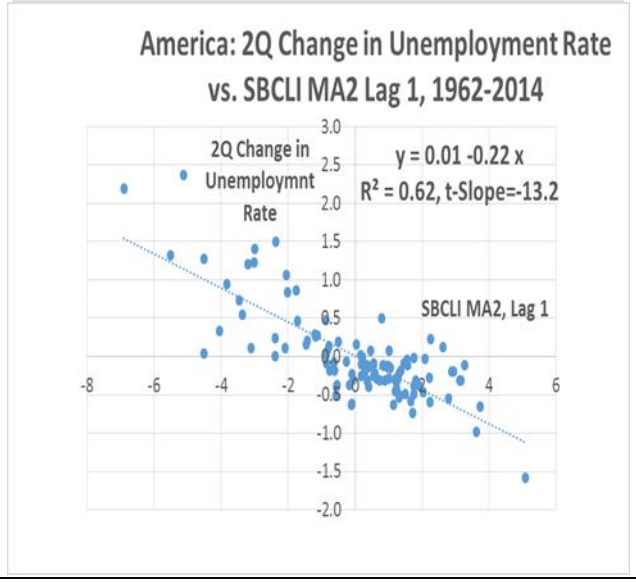


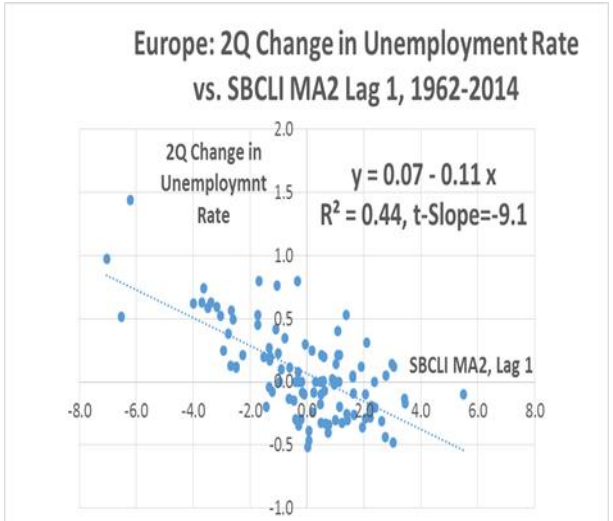
In the 3 Mega-Economies (America, Europe, AustralAsia), the SBCLI shows a significant leading relationship with GDP and Unemployment.











Slopes = Sensitivities of Next 4 Quarters Growth and Unemployment to SBCLI© Moves of 1 Point

Douglas T. Breeden, Duke University and Amundi Smith Breeden

	GDP Trend Growth 10 Yr	GDP Sensitivity	Industrial Production	Unemployment Rate
United States	**1.4**	0.50	1.08	-0.45
Canada	**1.7**	0.41	0.63	-0.27
Brazil	**3.0**	1.03	0.82	-0.50
Mexico	**2.3**	0.42	0.47	-0.11
France	**0.7**	0.36	1.04	-0.16
Germany	**1.4**	0.66	1.80	-0.10
Italy	**-0.6**	0.53	1.30	-0.25
Spain	**0.3**	0.91	1.15	-0.88
United Kingdom	**1.0**	0.46	0.58	-0.19
Russia	**2.4**	1.62	1.67	-0.43
Turkey	**3.8**	0.76	1.18	-0.55
Japan	**0.5**	0.34	1.04	-0.15
Australia	**3.3**	0.29	0.22	-0.27
South Korea	**2.7**	0.07	1.13	-0.09
China*	**7.0**	0.72	1.16	-0.01
India	**7.4**	0.34	1.27	
Indonesia	**5.6**	0.40		
Averages All	**2.6**	**0.58**	**1.03**	**-0.29**
Average Advanced	**1.2**	**0.45**	**1.00**	**-0.28**
Average Emerging	**4.5**	**0.76**	**1.10**	**-0.32**
Average Americas	**2.1**	**0.59**	**0.75**	**-0.33**
Average Europe	**1.3**	**0.76**	**1.25**	**-0.37**
Average AustralAsia	**4.4**	**0.36**	**0.96**	**-0.13**

*China trend growth uses average of last 3 years. Other countries are for last 10 years.

Comparisons with OECD Leading Indicators:

Contemporaneous Correlations of SBCLI with OECD Indexes of Leading Economic Indicators (2Q% Change), 1961-2011 Q2

Advanced Americas correlation = 0.74

Advanced Europe correlation = 0.74

Advanced AustralAsia correlation = 0.67

G-7 Economies

Impact of Consumer Signal on Explanatory Power: Correlation of Forecasts with Actuals 2 to 4 Quarters Later
Standard Period from 2007Q1-2015 Q1 Covering the Great Recession of 2008/9 and Sovereign Debt Crisis 2011-2015

G-7 Country	Begin Date: / Ending: 2015-Q2	2-Quarter Forecasts					4-Quarter Forecasts				
		Stocks + Bond Slope	Stocks + Consumers	Stocks, Bonds Consumers	OECD* Leading Indicators	SBCLI-LEI	Stocks + Bond Slope	Stocks + Consumers	Stocks, Bonds Consumers	OECD* Leading Indicators	SBCLI-LEI
United States	2007-Q1	0.68	0.77	0.77	0.74 *	0.03	0.57	0.66	0.74	0.64 *	0.10
Canada	2007-Q1	0.56	0.54	0.60	0.69 **	-0.09	0.46	0.24	0.42	0.55 **	-0.13
France	2007-Q1	0.60	0.66	0.64	0.65	-0.01	0.63	0.58	0.66	0.63	0.03
Germany	2007-Q1	0.55	0.53	0.52	0.57	-0.05	0.51	0.43	0.52	0.48	0.04
Italy	2007-Q1	0.49	0.56	0.54	0.58	-0.04	0.55	0.51	0.57	0.54	0.03
United Kingdom	2007-Q1	0.64	0.63	0.69	0.56	0.13	0.58	0.42	0.57	0.54	0.03
Japan	2007-Q1	0.46	0.45	0.44	0.41	0.03	0.33	0.38	0.38	0.21	0.17
Averages		0.57	0.59	0.60	0.60	0.00	0.52	0.46	0.55	0.51	0.04

*For USA, Conference Board's LEI is used, as it has higher correlations than the OECD's Leading Index.

**For Canada, note that the MA2 forecasts for Stocks and Bonds and SBCLI are worse than not using the moving average. Use of just the latest observation would increase correlations from 0.56 to 0.63, 0.54 to 0.73 and 0.60 to 0.72, respectively, and 0.46 to 0.50 , 0.24 to 0.48, and 0.42 to 0.56 for 4 quarter forecasts.

Out of Sample "Implied R-Squareds" 1977-2011 Q2

Simulation Performance Quite Similar Between SBCLI, LEI

First 15 years of data for training regressions. Expanding windows of data.

	Real GDP 2Q %Change	Ind. Prodn 2Q%Change	2Q Change in Unemployment Rate	Employment Growth, 2Q%
Adv Americas:				
SBCLI	0.55 Better	0.54 Tie	0.63 Better	0.59 Tie
USA LEI	0.37	0.42	0.47	0.49
OECD LEI	0.41	0.54	0.55	0.59
Advanced Europe SBCLI	0.57 Better	0.43 Worse	0.58 Tie	0.65 Better
OECD LEI	0.52	0.52	0.59	0.58
Adv AustralAsia				
SBCLI	0.40 Tie	0.42 Tie	0.21 Worse	0.21 Better
OECD LEI	0.40	0.43	0.24	0.13

Conclusions:
Stocks, Bonds, and Consumers As Leading Indicators

- It has long been known that the stock market is a leading indicator, "having forecasted 9 out of the last 4 recessions," as MIT Nobel Laureate Paul Samuelson famously said.

- We showed that the bond market's slope of the term structure of interest rates is also a good forecaster for advanced economies. The bond market's sovereign debt spreads are helpful signals for emerging economies.

- We used Breeden's "Consumer signal" and showed that best forecasting performance uses a composite of all three key variables.

- The simple and intuitive 3-variable SBCLI© demonstrates forecasting accuracy similar to the indexes of leading indicators by the Conference Board and by the Paris-based OECD.

Douglas T. Breeden is the William W. Priest Professor of Finance and former Dean of Duke University's Fuqua School of Business. He also served on faculties at Chicago Booth, Stanford and North Carolina, where he was the Dalton McMichael Professor of Finance. He was the Fischer Black Visiting Professor of Financial Economics at MIT's Sloan School in 2011-2013, winning an "Outstanding Teacher" award.

Breeden published seminal research on insurance prices implicit in option prices, the Consumption CAPM, and hedging mortgage securities. His current research is "A Stocks, Bonds, Consumers Leading Indicator" and (with Robert Litzenberger) "Central Bank Policy Impacts on the Distribution of Future Interest Rates," which won a Roger Murray Prize from the Q-Group. He has presented this research recently to central bank meetings in the USA, England, France and Italy, as well as at the International Monetary Fund.

Breeden was Associate Editor of 5 top journals. He was also Founding Editor and Editor for 10 years of the Journal of Fixed Income. He was elected to the Board of Directors of the American Finance Association and in 2010 a lifetime Fellow. The International Association for Quantitative Finance named Breeden "Financial Engineer of the Year 2013" for being an "industry pioneer."

Breeden holds a Ph.D. in Finance from Stanford and an S.B. from M.I.T. He served on the MIT President's Council, the Sloan School Visiting Committee and the Stanford Business School Advisory Council. He was named an Honorary Professor of the Chinese Academy of Sciences and served on the Boards of Goethe Business School in Germany and the Financial Management Association. He is on the Board of Trustees of Commonfund. Breeden is a Senior Research Consultant for Amundi Smith Breeden, a money management firm that he co-founded.

This research information and data is presented for informational purposes only. The views presented are subject to change and do not necessarily represent Amundi Smith Breeden's views. This information is not to be considered investment advice.