Massachusetts Institute of Technology
Sloan School of Management

Consumption As A Leading Indicator

A Stocks, Bonds, Consumers Leading Index (SBCLI)

Douglas T. Breeden*

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*Fischer Black Visiting Professor of Financial Economics at MIT and William W. Priest Professor and Former Dean, Duke University, Fuqua School of Business.

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Overview: Three Key Factors In Economic Forecasting

S. **Stocks: Stock market returns** predict profits, which are related to economic growth.

B. **Bonds: Term structure slope** predicts increases and slowdowns in economic growth.

C. **Consumers:** Consumers make intelligent choices, C(W,s,t). **Consumption growth that is independent of stock market returns** reflects consumers' views of jobs, incomes and investment opportunities.

S. Stock Market Returns Predict Profits and Economic Growth.

S&P 500 Return Leads Changes in Unemployment

6-month percentage changes, 1960-2008 (Dec-Jun-Dec).

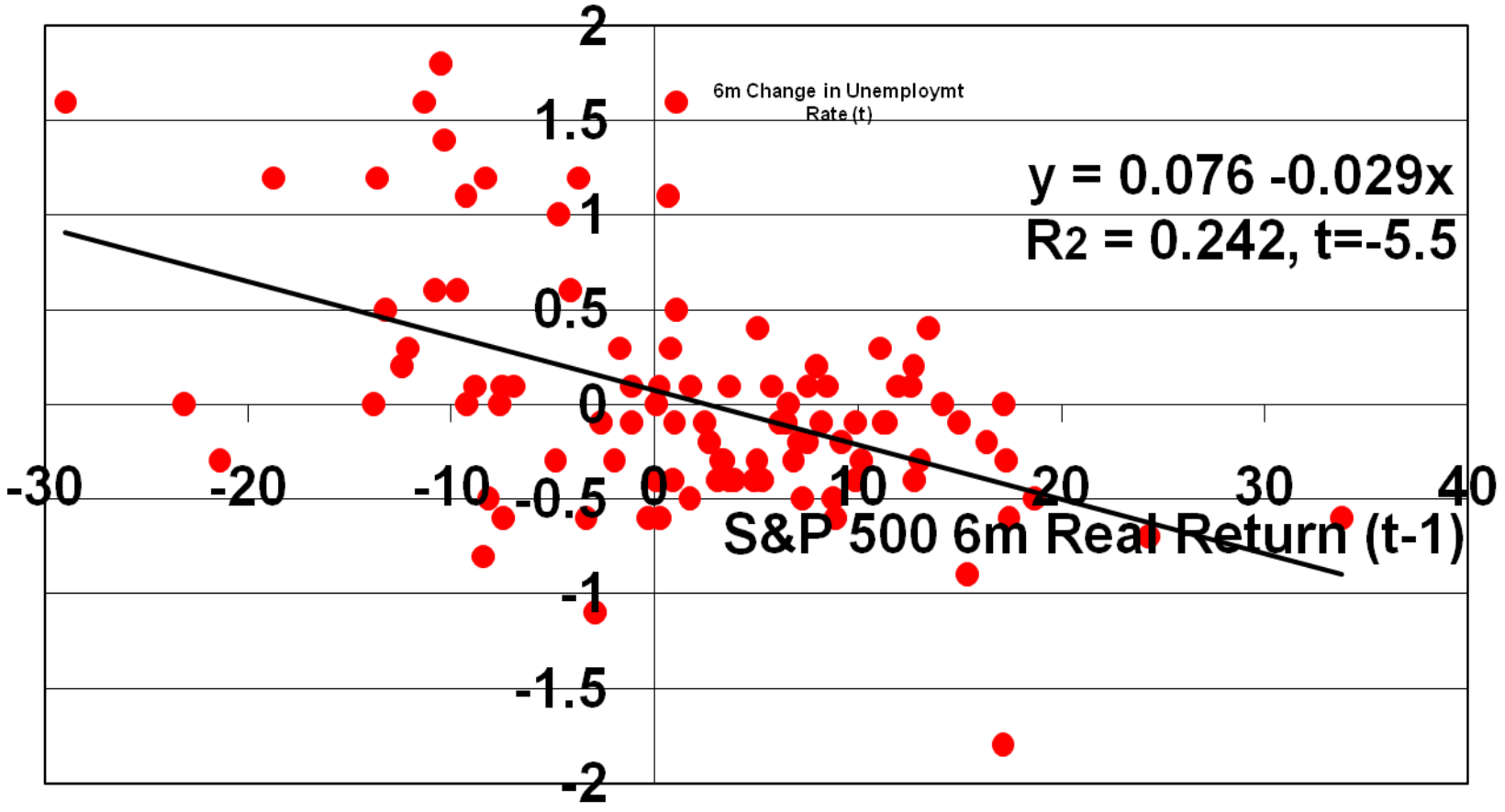
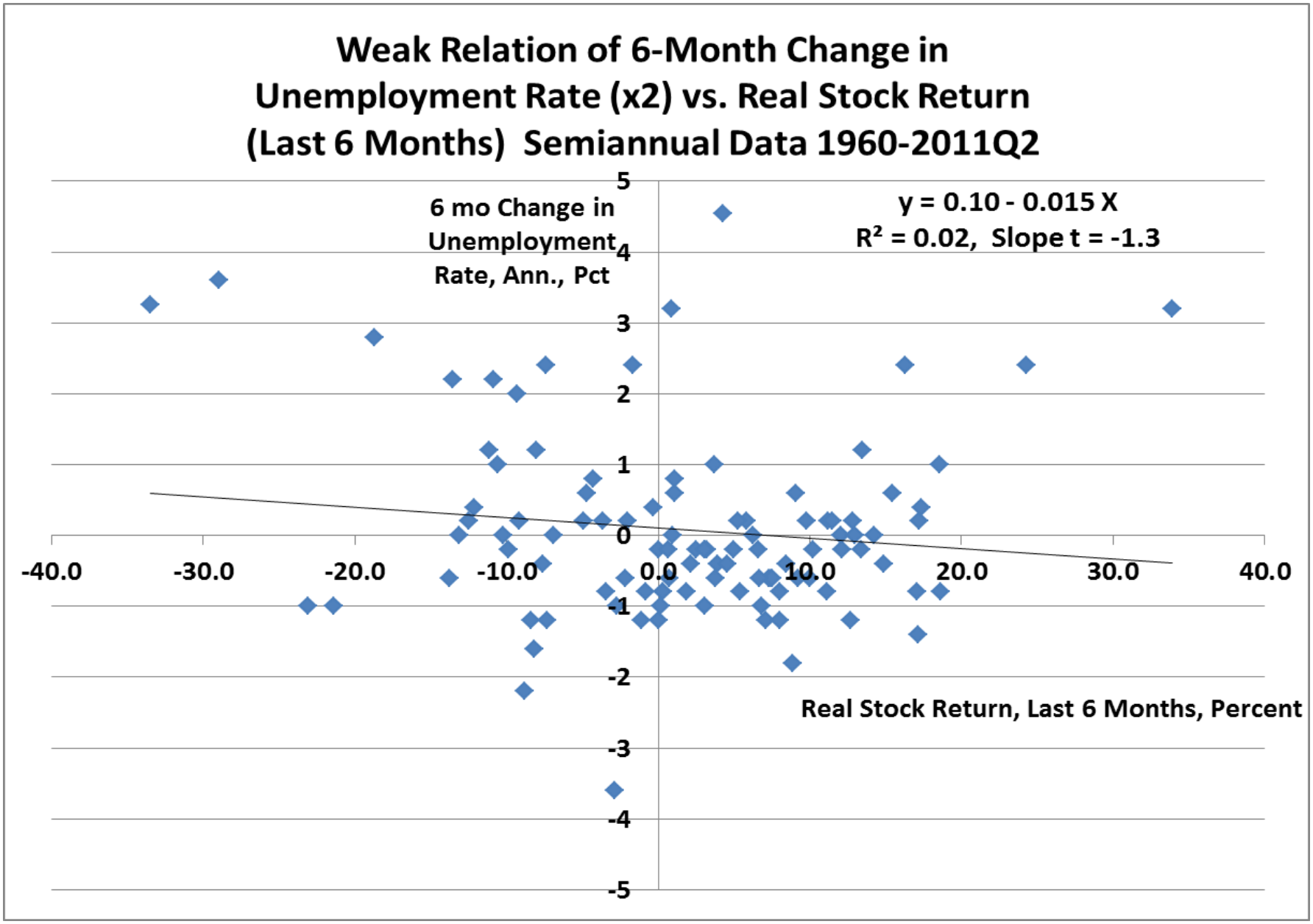
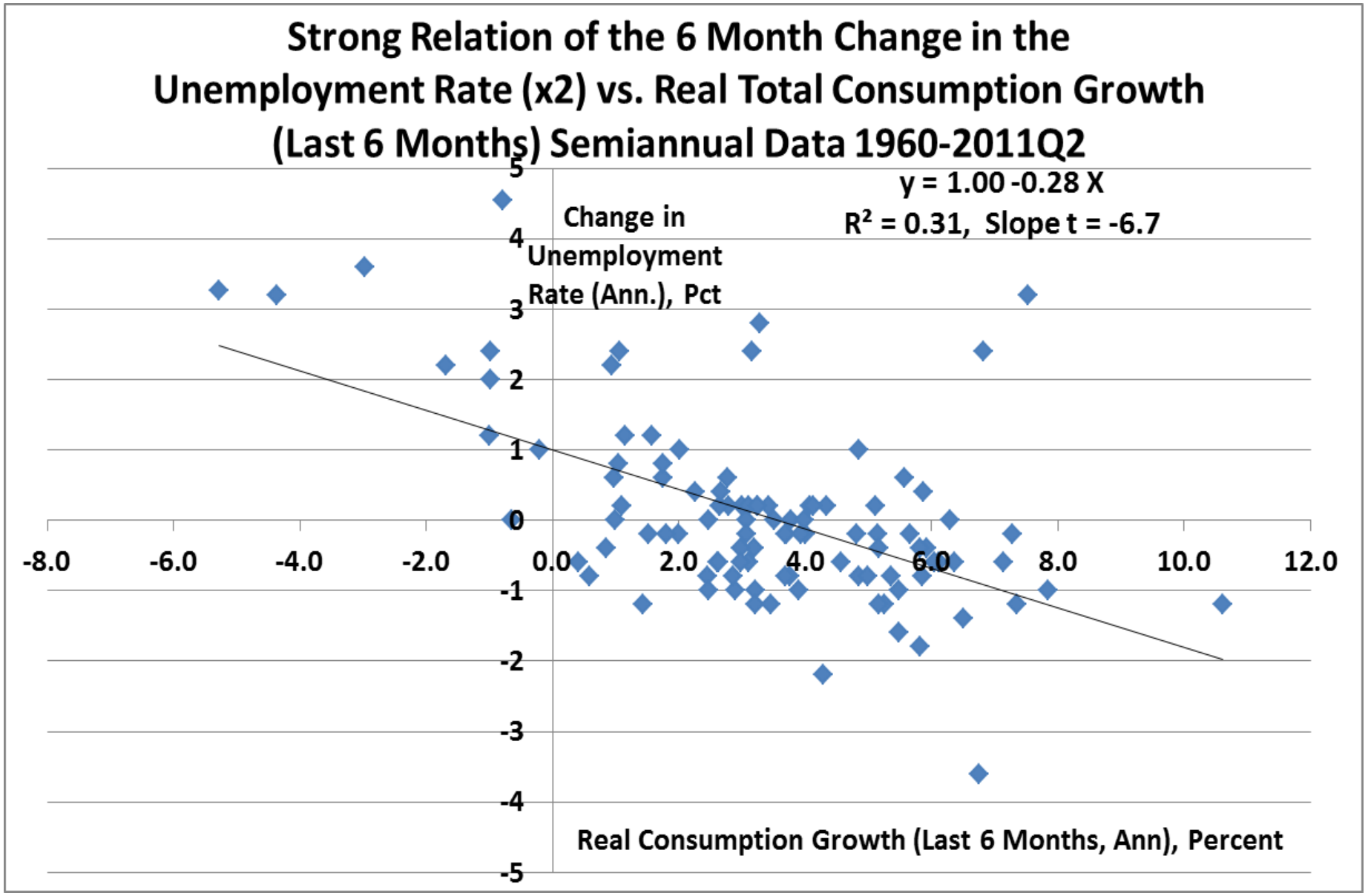


Figure 6
Real S&P 500 Returns Lead Macro Variables 1960-2011 Q2:
Regressions of Semiannual Growth on Lagged S&P 500 Returns

Dependent Variable Y(t)	Const	Lagged Y (t-1) Var.	Stock Return Prior Lag 1: R(t-1)	Stock Return Lag 2: R(t-2)	Residual Auto-correlation	Corrected R-Squared
Unemployment Rate Change, 6 mo	0.19 t=2.0	0.32 t=3.6	-0.059 t= - 6.9	-0.019 t= -1.9	0.05	0.46 N=103
Employment Growth, 6 mo, Annualized	0.67 t=3.6	0.43 t=5.3	0.057 t=4.5	0.037 t=2.7	0.00	0.41 N=103
Real GDP Growth 2 Quarters, Annualized	2.08 t=5.7	0.25 t=2.5	0.109 t=4.5	0.019 t=0.7	0.00	0.29 N=103
Industrial Production Growth, 6 mo, Ann.	1.52 t=2.9	0.29 t=2.9	0.24 t=5.4	0.006 t= 0.1	0.01	0.34 N=103
Real Total Consumption Growth 2 Quarters,Annual	2.03 t=5.4	0.355 t=3.5	0.038 t=1.7	0.017 t= 0.8	-0.01	0.21 N=103


Weak Relation of 6-Month Change in Unemployment Rate (x2) vs. Real Stock Return (Last 6 Months) Semiannual Data 1960-2011Q2
6 mo Change in Unemployment Rate, Ann., Pct
y = 0.10 - 0.015 X
R² = 0.02, Slope t = -1.3
Real Stock Return, Last 6 Months, Percent
5
4
3
2
1
0
-1
-2
-3
-4
-5
-40.0
-30.0
-20.0
-10.0
0.0
10.0
20.0
30.0
40.0


Strong Relation of the 6 Month Change in the Unemployment Rate (x2) vs. Real Total Consumption Growth (Last 6 Months) Semiannual Data 1960-2011Q2
y = 1.00 -0.28 X
R² = 0.31, Slope t = -6.7
Change in Unemployment Rate (Ann.), Pct
Real Consumption Growth (Last 6 Months, Ann), Percent
5
4
3
2
1
0
-1
-2
-3
-4
-5
-8.0
-6.0
-4.0
-2.0
0.0
2.0
4.0
6.0
8.0
10.0
12.0

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

Theory: Term Structure of Interest Rates Optimally Related to Changes in Real Economic Growth

- Breeden's, (1986, Journal of Financial Economics) article, on "Consumption, Production, Inflation and Interest Rates: A Synthesis," following Fisher (1907), Hirshleifer(1970) and others, derived and illustrated optimal relations of the term structure of interest rates with the term structures of expected consumption growth, volatility and inflation.

- Harvey (JFE 1988, 1989,1991) tested Breeden's equilibrium model's predictions and found them to be powerful, forecasting economic growth better than many professional economists and working in many countries.

- Term Structure Formula (Real Rates and Real Growth):

$$r(t,T) = \rho + [RRA]\mu_C(t,T) - \frac{[RRA]^2}{2}\sigma_C^2(t,T)$$

$$= \begin{bmatrix} \text{Time} \\ \text{Preference} \end{bmatrix} + \begin{bmatrix} \text{Risk} \\ \text{Aversion} \end{bmatrix} \begin{bmatrix} \text{Expected} \\ \text{Consumption} \\ \text{Growth} \end{bmatrix} - \begin{bmatrix} \frac{(RRA)^2}{2} \end{bmatrix} \begin{bmatrix} \text{Variance of} \\ \text{Consumption} \\ \text{Growth} \end{bmatrix}$$

Source: Breeden, Douglas T., "Consumption, Production and Interest Rates: A Synthesis," *Journal of Financial Economics*, May 1986.

Economic Growth and the Term Structure

- Basic Economic Insights

1. High real interest rates induce individuals to reduce consumption, save, and consume more later:

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

2. Normal risk aversion implies that individuals prefer to buy riskless assets (versus risky). This protects against uncertain futures:

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

3. Countries with higher degrees of time preference (impatience to consume) have to have higher rates.

"Forecasts of Economic Growth from Bond and Stock Markets"

By Campbell R. Harvey

Financial Analysts Journal, September-October, 1989

Campbell Harvey is J. Paul Sticht Professor of Finance at Duke University's Fuqua School of Business. Harvey received his Ph.D. from the University of Chicago. He is currently the Editor of the *Journal of Finance*.

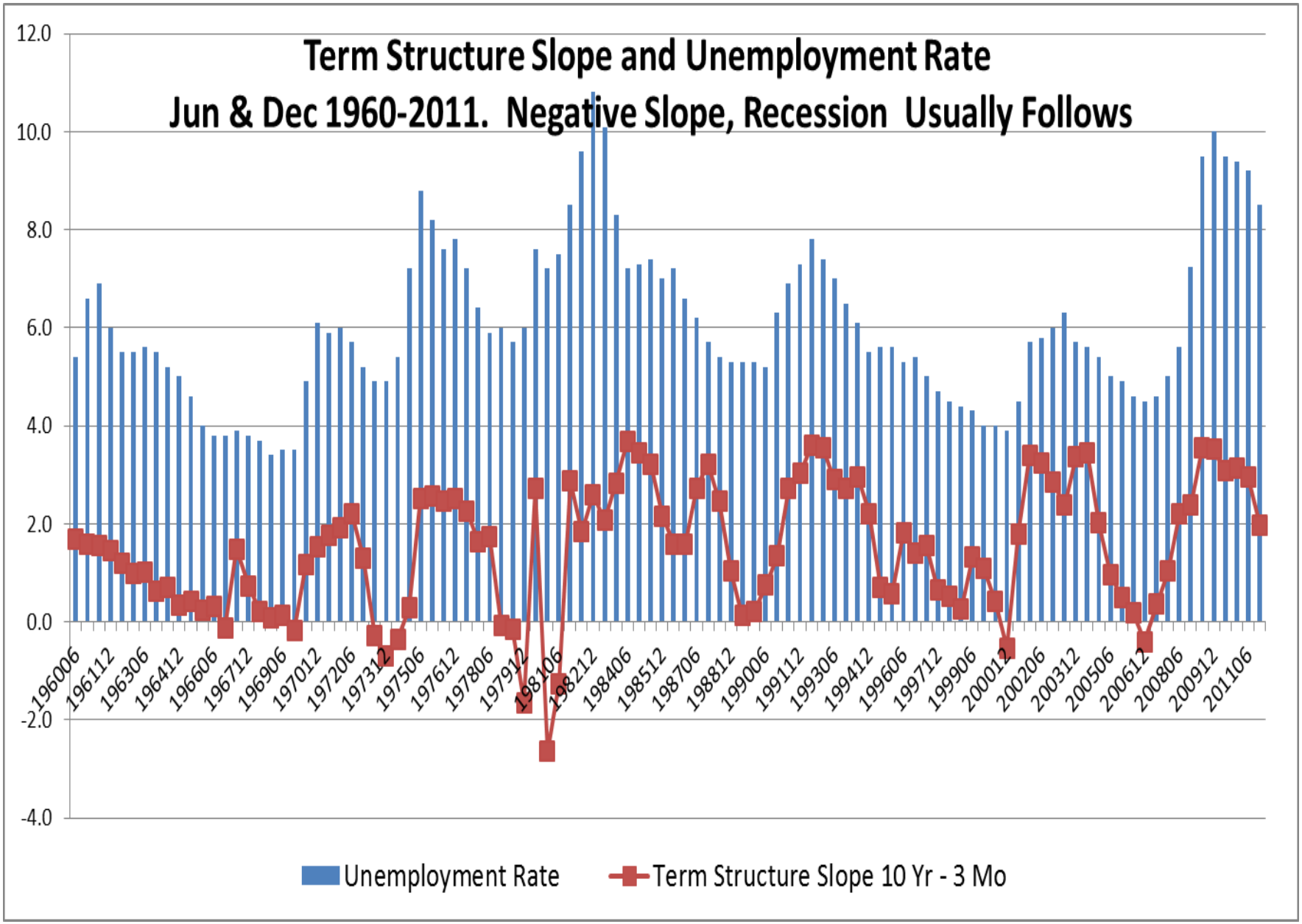
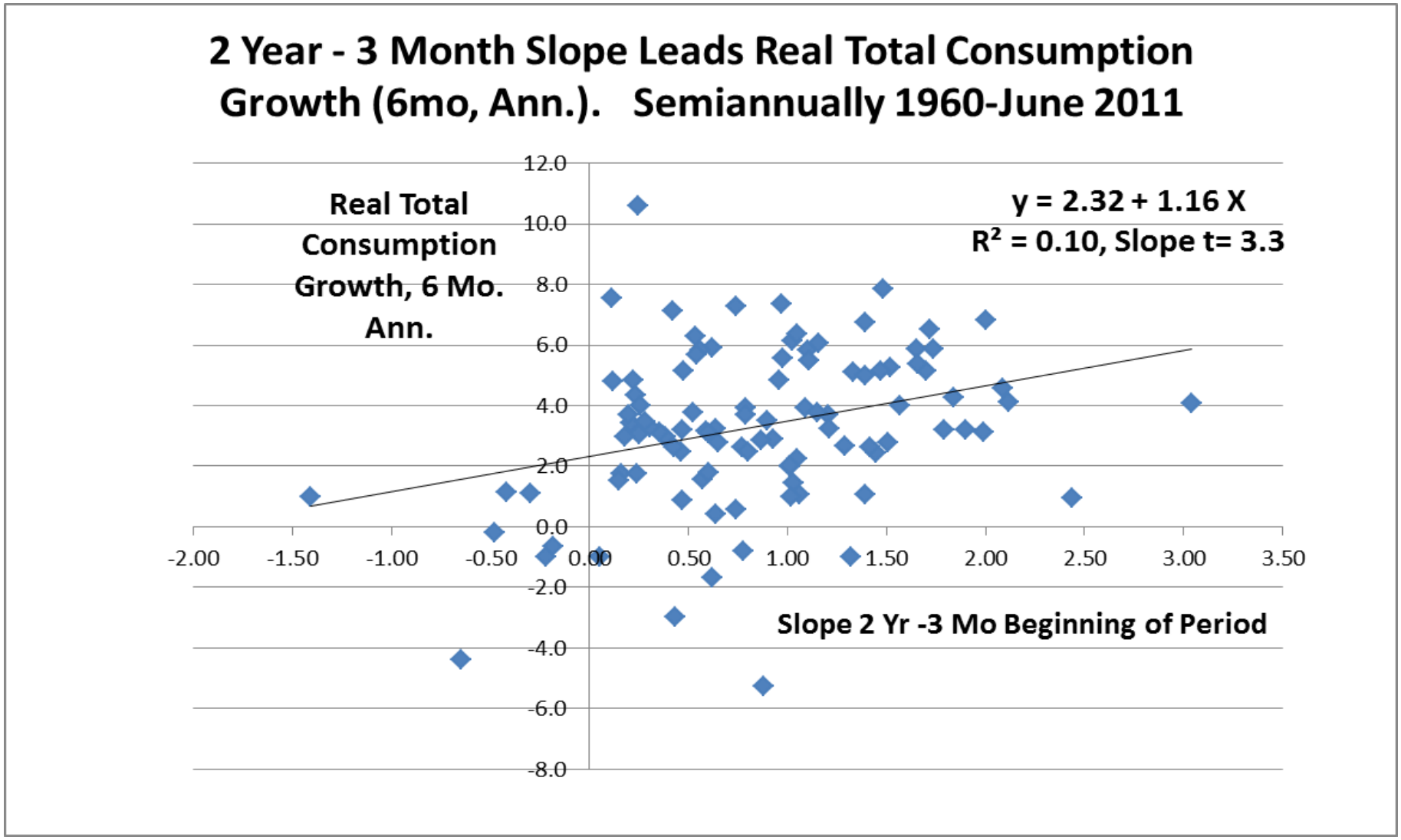

Term Structure Slope and Unemployment Rate
Jun & Dec 1960-2011. Negative Slope, Recession Usually Follows
12.0
10.0
8.0
6.0
4.0
2.0
0.0
-2.0
-4.0
196006
196112
196306
196412
196606
196712
196906
197012
197206
197312
197506
197612
197806
197912
198106
198212
198406
198512
198706
198812
199006
199112
199306
199412
199606
199712
199906
200012
200206
200312
200506
200612
200806
200912
201106
Unemployment Rate
Term Structure Slope 10 Yr - 3 Mo

Figure 3


2 Year - 3 Month Slope Leads Real Total Consumption Growth (6mo, Ann.). Semiannually 1960-June 2011
Real Total Consumption Growth, 6 Mo. Ann.
y = 2.32 + 1.16 X
R² = 0.10, Slope t= 3.3
Slope 2 Yr -3 Mo Beginning of Period
12.0
10.0
8.0
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
-2.00
-1.50
-1.00
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50

C. Consumption Deviations from Wealth Predict Jobs, Income Growth and Investment Opportunities

Theory: Consumption Deviations from Wealth Predict Income and Investment Opportunities

- Following Merton and Rubinstein, Breeden (JFE 1979, JET 1984) studied optimal consumer behavior in a model where consumers carefully 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.

Breeden, 1984 Journal of Economic Theory

Intertemporal Theory Implies:

Consumption Residual Predicts Opportunity Set

$\underline{S}$ = Vector of state variables for opp. set (for income, investment opps.)

Optimal Consumption Policy (Breeden, 1986):

$$\frac{\partial C}{\partial \underline{S}} = -(RRA - 1)\left[\left.\frac{\partial W}{\partial \underline{S}}\right|_J\right]$$

$$= (RRA - 1)\left[\frac{\Delta \text{ Value of Opportunity Set}}{\Delta \underline{S}}\right]$$

> 0 if RRA > 1, Opp. set $\uparrow$ when $\underline{S} \uparrow$

$$C = C(W, \underline{S}, t)$$

stochastic part: $\tilde{dc} = C_W \tilde{dW} + \underline{C}_S \tilde{d\underline{S}}$

$$\Rightarrow \tilde{dC} - C_W \tilde{dW} = \underline{C}_S \, d\underline{S}$$

"Consumption Residual" $= (>0) \cdot$ (Δ Value of Opportunity Set)

Theory: Consumption Deviations from Wealth As a Predictor

- If consumption is high, relative to wealth, then consumers likely believe that job and wage opportunities in the future will be quite good (which is why C is high).

- High consumption/wealth may also reflect consumers' views that investment opportunities (profits and risk) will be attractive and provide adequately for future.

- Lettau and Ludvigson (JF 2001) showed that deviations of (log) consumption from its trend relationship with household net worth and wages, "cay," was a significant predictor of stock returns. A 1 sigma consumption deviation was associated with 2.2% annualized higher returns in future stock investments. This validated the theory of Merton (1973) and Breeden (1979), as consumption strongly reflected investment opportunities.

Lettau and Ludwigson's Important Research J. Finance (2001), JPE (2001)

- Their JPE (2001) paper showed that using cay as a conditioning or "scaling variable" they were able to resurrect the Consumption CAPM by demonstrating that ***conditional consumption betas*** explained the "value premium" of returns versus betas. Betas for value stocks are higher than for growth stocks in bad times, when cay is high and risk premia are high. Value stocks' consumption betas are lower in good times, when risk premia are small.

- Lettau and Ludwigson **did not find that consumption deviations were helpful in explaining macro variables**, saying cay deviations "…primarily forecast future movements in asset wealth, rather than movements in consumption or labor income." (JF, p.842) and "… cay has no forecasting power for future consumption growth at any horizon…" (JF, p. 839).

3 Global Mega-Economy Composites: Percentage Weights Trillion Dollar Economies (TDEs) with GDP/Capita>$US 10,000

	1970	1990	2010
Advanced America TDEs	100.0%	100.0%	100.0%
United States	90.3	89.8	90.0
Canada	9.7	10.2	10.0
Advanced Europe TDEs	100.0%	100.0%	100.0%
United Kingdom	47.3	20.8	22.4
Germany	18.5	27.2	28.2
France	14.8	22.1	21.1
Italy	11.6	19.9	16.9
Spain	7.9	9.9	11.3
Advanced AustralAsia TDEs	100.0%	100.0%	100.0%
Japan	90.4	77.7	63.6
Australia (added 1970)	9.6	8.2	14.4
South Korea (added 1990)	0.0	7.0	11.8
Hong Kong, Singapore, Taiwan (1990)	0.0	7.1	10.2

Data Differencing: 2 Quarters or 6 Months Autocorrelation in Growth Rates of Real Consumption and Real GDP for USA

- Breeden, Gibbons, Litzenberger (J. Finance 1989) examine time aggregation biases in macroeconomic data. Larger differencing intervals give autocorrelations less affected by **noise** in the data.

- Monthly consumption data available in USA since 1959. Autocorrelation of real growth with various differencing intervals:

Autocorrelation for :	**Consumption**	**GDP**
1-month % changes	-0.17	
1-quarter % changes	+0.31	+0.32
2-quarter % changes	+0.44	+0.40

2-quarter or 6-month % changes are used in this research for higher "signal to noise" ratio. 50 Years of data 1960-2009 gives 100 semiannual observations.

3 Mega-Economies: Removing the Wealth Effect from Consumption: Real Consumption Growth Predicted by Stock Returns

2 Quarter Changes (Q2-Q4-Q2). 50 Years: 1961 – Q2/2011

Dependent Var Real Total Consumption Growth (2Q%, Annlzd)	Real Stock Return 2Q% Current	Real Stock Return 2Q% Lag1	Real Stock Return 2Q% Lag 2	20 Yr Historic Trend Growth Rl GDP	Const	**Corr RSQ**
Advancd Americas	**0.093**	**0.058**	**0.041**	**0.87**	**-0.29**	**0.39**
1961Q2-2011Q2	**t=5.4**	**t=3.3**	**t=2.4**	**t=4.6**	**t= -0.4**	**N=101**
Advanced Europe	**0.035**	**0.032**	**0.017**	**1.15**	**-1.15**	**0.41**
1962Q2-2011Q2	**t=3.0**	**t=2.7**	**t=1.4**	**t=7.9**	**t= -2.2**	**N=97**
Advanced AusAsia	**0.051**	**0.025**	**0.022**	**0.83**	**-0.93**	**0.46**
1961Q2-2010Q4	**t=2.6**	**t=1.3**	**t=1.1**	**t=8.5**	**t= -1.5**	**N=100**

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).

Cperp ($C^{\perp}$) Represents Consumption Risk **Not** Picked Up By Stock Market Betas

With no lags: $\tilde{c}^{\perp} = \Delta \ln \tilde{c} - [a + \beta_{cM}(\tilde{r}_M - r_f)]$

$$\mathrm{cov}(\tilde{r}_j, \tilde{c}^{\perp}) = \mathrm{cov}[r_j, \Delta \ln \tilde{c} - \beta_{cM}(\tilde{r}_M - r_f)]$$

$$= \beta_{jc}\sigma_c^2 - \beta_{cM}\beta_{jM}\sigma_M^2$$

But $\sigma_{jc^{\perp}} = \sigma_{jc} - \beta_{jM}\sigma_{cM}$

$$\frac{\sigma_{jc^{\perp}}}{\sigma^2_{c^{\perp}}}\left(\frac{\sigma^2_{c^{\perp}}}{\sigma_c^2}\right) = \beta_{jc} - \beta_{jM}\beta_{Mc}$$

$$\Rightarrow \boxed{\beta_{jc} = \beta_{jM}\beta_{Mc} + \beta_{jc^{\perp}}\beta_{c^{\perp},c}}$$

Q.E.D.

$C^{\perp}$ correlations give insights for assets not well priced by CAPM betas.

Figure 13, USA Illustration

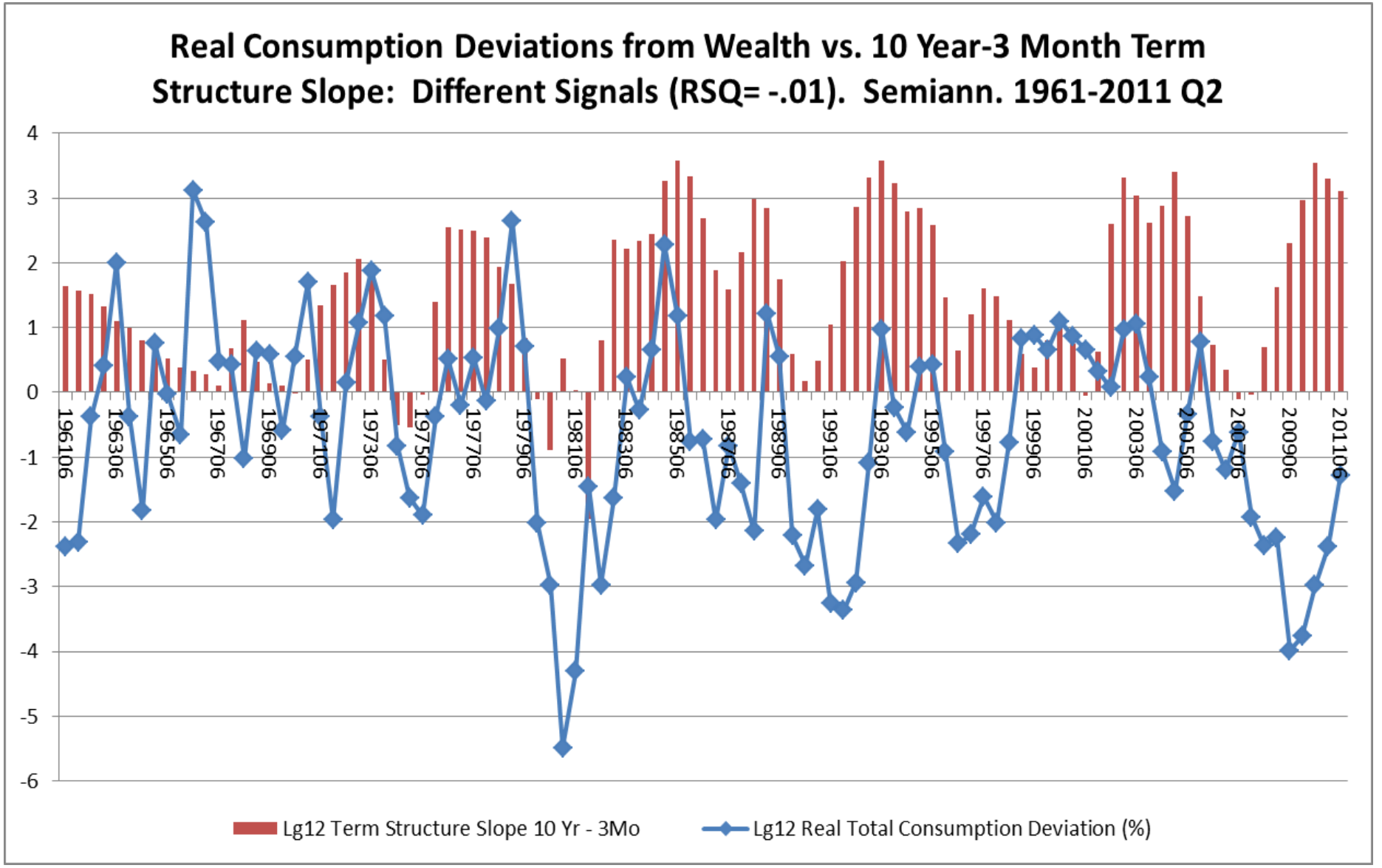
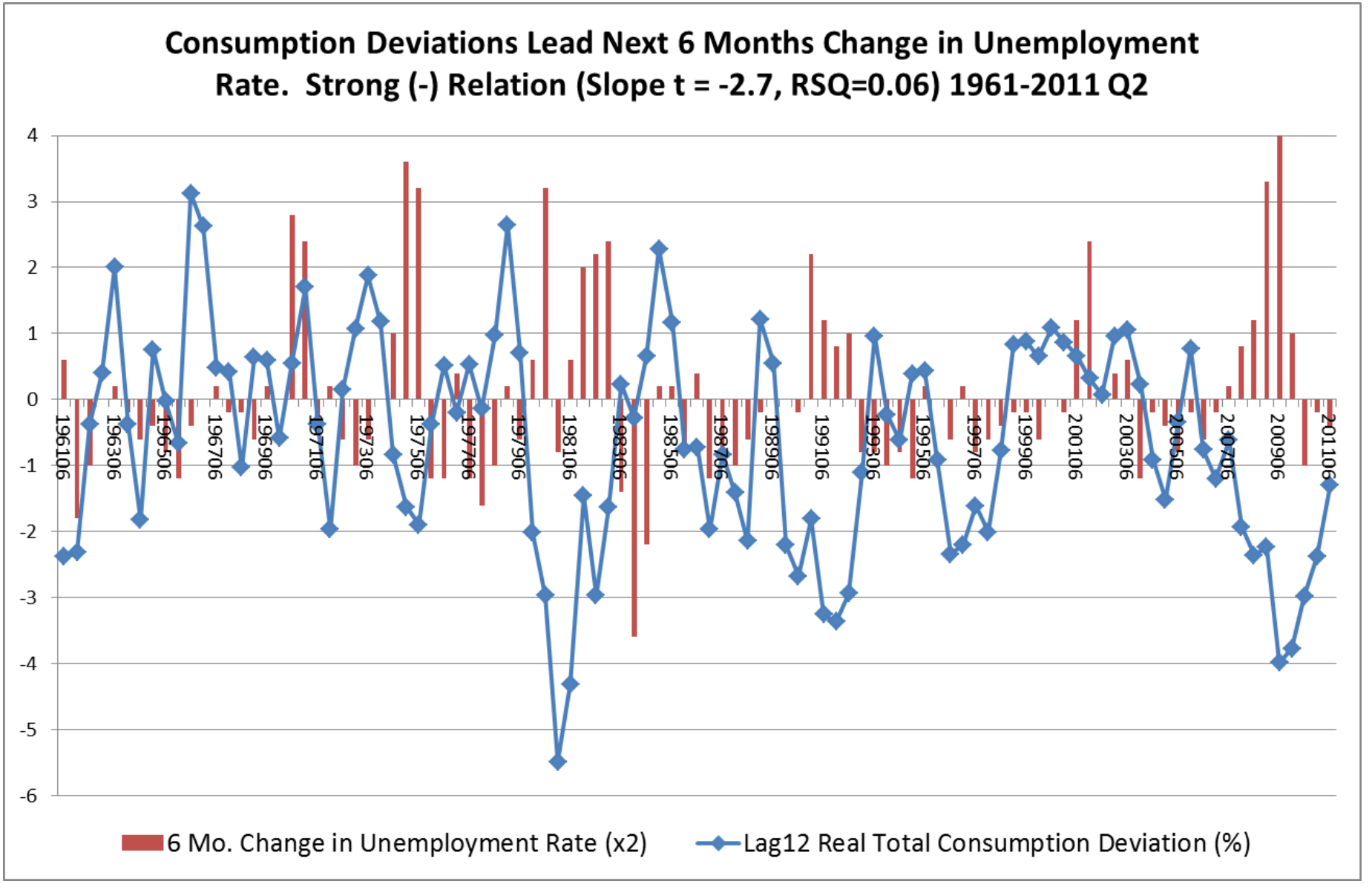


Figure 17, USA Illustration



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

Advanced Americas: Macroeconomic Variables Related to Z Scores for Lagged Stock Returns, Lag of Term Structure Slope, and Lagged Avg *Total* Consumption Deviations

2-Quarter Changes (Q2-Q4-Q2) 1962-2011 Q2. Nonoverlapping data. Nobs=99.

Variable (Y_t)	Con-stant	Historic GDP Trend Growth	Lag Y_{t-1}	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	-2.13 (t=-2.5)	1.40 (t=6.2)		1.23 (t=6.7)	0.59 (t=3.3)	0.88 (t=4.2)	0.61 (t=3.1)	0.56
Industrial Production 2QAnn%Chg	-7.58 (t=-5.0)	2.80 (t=7.0)		3.00 (t=9.1)	1.25 (t=3.9)	2.02 (t=5.4)	0.88 (t=2.5)	0.65
Unemploymt Rate* 2Q Change	0.62 (t=3.9)	-0.16 (t=-3.8)	0.19 (t=2.2)	-0.32 (t=-9.2)	-0.13 (t=-2.8)	-0.18 (t=-4.6)	-0.16* (t=-3.1)	0.70
Total Employmnt* 2Q Ann%Chg	-1.43 (t=-2.9)	0.72 (t=5.2)	0.21 (t=2.4)	0.65 (t=6.0)	0.43 (t=3.5)	0.32 (t=2.5)	0.61* (t=3.6)	0.63

Advanced Europe: Macroeconomic Variables Related to Z Scores for Lagged Stock Returns, Lagged Term Structure Slope, and Lagged Avg *Total* Consumption Deviations

2-Quarter Changes (Q2-Q4-Q2) 1963-2011 Q2. Nonoverlapping data. Nobs=97.

Variable (Y_t)	Con-stant	Historic GDP Trend Growth	Lag Y_{t-1}	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	-0.53 (t=-1.0)	1.00 (t=6.8)		0.85 (t=6.0)	0.38 (t=2.7)	0.48 (t=3.2)	0.66 (t=4.7)	0.60
Industrial Production 2QAnn%Chg	-1.7 (t=-1.3)	1.27 (t=3.4)		1.86 (t=5.2)	1.06 (t=3.0)	1.68 (t=4.5)	1.26 (t=3.6)	0.52
Unemploymt Rate 2Q Change	0.01 (t=0.1)	0.01 (t=0.3)	0.436 (t=5.2)	-0.109 (t=-4.4)	-0.058 (t=-2.2)	-0.060 (t=-2.2)	-0.100 (t=-3.5)	0.60
Total Employmnt 2Q Ann%Chg	0.68 (t=2.2)	-0.14 (t=-1.7)	0.49 (t=5.7)	0.26 (t=3.1)	0.19 (t=2.3)	0.16 (t=1.7)	0.26 (t=2.8)	0.54

Advanced AustralAsia: Macroeconomic Variables Related to Z Scores for Lagged Stock Returns, Lagged Term Structure Slope, and Lagged Avg *Total* Consumption Deviations

2-Quarter Changes (Q2-Q4-Q2) 1962-2010 Q4. Nonoverlapping data. Nobs=98.

Variable (Y_t)	Con-stant	Historic GDP Trend Growth	Lag Y_{t-1}	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	-0.85 (t=-1.2)	0.88 (t=7.9)		1.05 (t=3.5)	0.098 (t=0.3)	-0.027 (t=-0.1)	0.72 (t=2.4)	0.45
Industrial Production 2QAnn%Chg	-2.8 (t=-2.0)	1.24 (t=5.6)		3.27 (t=5.4)	0.85 (t=1.4)	1.77 (t=2.9)	2.66 (t=4.5)	0.51
Unemploymt Rate* 2Q Change	0.038 (t=0.9)	-0.002 (t=-0.2)	0.119 (t=1.2)	-0.072 (t=-4.1)	-0.051 (t=-2.6)	-0.015 (t=-0.8)	-0.046* (t=-2.0)	0.30
Total Employmnt YoY %Chg	0.110 (t=0.9)	0.044 (t=2.1)	0.58 (t=8.4)	0.18 (t=3.5)	0.17 (t=3.2)	0.036 (t=0.7)	0.134 (t=2.6)	0.63

Out of Sample Global Stepwise Simulations: Implied R^2 of Macro Variables on Lagged Stock Returns, Term Structure Slope, and Real Consumption Deviations, Semiannual 1977-2011

Variable (Y_t)	Historic 20 Yr GDP Trend In all Regs	Slope 10Y-3m Only Lag 1	RlStock Return Only, Lg1,Lg2	Stock Lg12 + Slope Lag 1	Stock Lg12 + PCETot Dev Lg1	Stock L12 Slope Lg1 PCETot Devn, Lg1	Leading Economic Indicators, Lg1, Lg2
Real GDP , 2Q% Chg							
Advanced Americas 1977 Q2 - 2011 Q2	-0.04	-.01	0.26	0.42	0.41	0.47	0.41 OECD 0.37 USA
Advanced Europe 1977Q2 to 2011 Q2	0.02	0.15	0.20	0.34	0.40	0.47	0.52
Advanced AustralAsia 1977Q2 to 2010 Q4	0.28	0.25	0.38	0.33	0.44	0.39	0.39
Indust. Prod'n, 2Q%Chg							
Advanced Americas 1977 Q2 - 2011 Q2	-0.08	-0.05	0.32	0.56	0.40	0.55	0.54 OECD 0.42 USA
Advanced Europe 1977Q2 to 2011 Q2	0.00	0.11	0.01	0.24	0.16	0.32	0.51
Advanced AustralAsia 1977Q2 to 2010 Q4	0.04	0.09	0.23	0.28	0.34 Lg1 0.39 Lg12	0.39 Lg1 0.42Lg12	0.42

Out of Sample Global Stepwise Simulations: Implied R^2 of Macro Variables on Lagged Stock Returns, Term Structure Slope, and Real Consumption Deviations, Semiannual 1977-2011

Variable (Y_t) (All employment and unemployment rate change regressions have lagged dependent var.)	Historic 20 Yr GDP Trend In all Regs	Slope 10Y-3m Only Lag 1	RIStock Return Only, Lg1,Lg2	Stock Lg12 + Slope Lag 1	Stock Lg12 + PCETot Dev Lg12	Stock L12 Slope Lg1 PCETot Devn, Lg12 Avg	Leading Economic Indicators, Lg1, Lg2
Unemploy Rate , 2Q Chg							
Advanced Americas 1977 Q2 - 2011 Q2	0.20	0.23	0.41	0.57	0.52	0.60	0.55 OECD 0.47 USA
Advanced Europe 1977Q2 to 2011 Q2	0.31	0.46	0.36	0.44	0.50 Lg1 0.48 Lg12	0.52 Lg1 0.50 Lg12	0.57
Advanced AustralAsia 1977Q2 to 2010 Q4	0.06	0.02	0.21	0.17	0.24	0.19	0.23
Employmnt 2Q%Chg*							
Advanced Americas 1977 Q2 - 2011 Q2	0.33	0.36	0.44	0.52	0.54	0.55	0.59 OECD 0.49 USA
Advanced Europe 1977Q2 to 2011 Q2	0.37	0.46	0.45	0.46	0.55 Lg1 0.48 Lg12	0.53 Lg1 0.47 Lg12	0.55
Advanced AustralAsia* 1977Q2 to 2010 Q4,**YoY**	0.59	0.52	0.68	0.64	0.69	0.66	0.64

USA Comparison of Out of Sample Forecasts for Real Personal Income and Real Wage Growth:

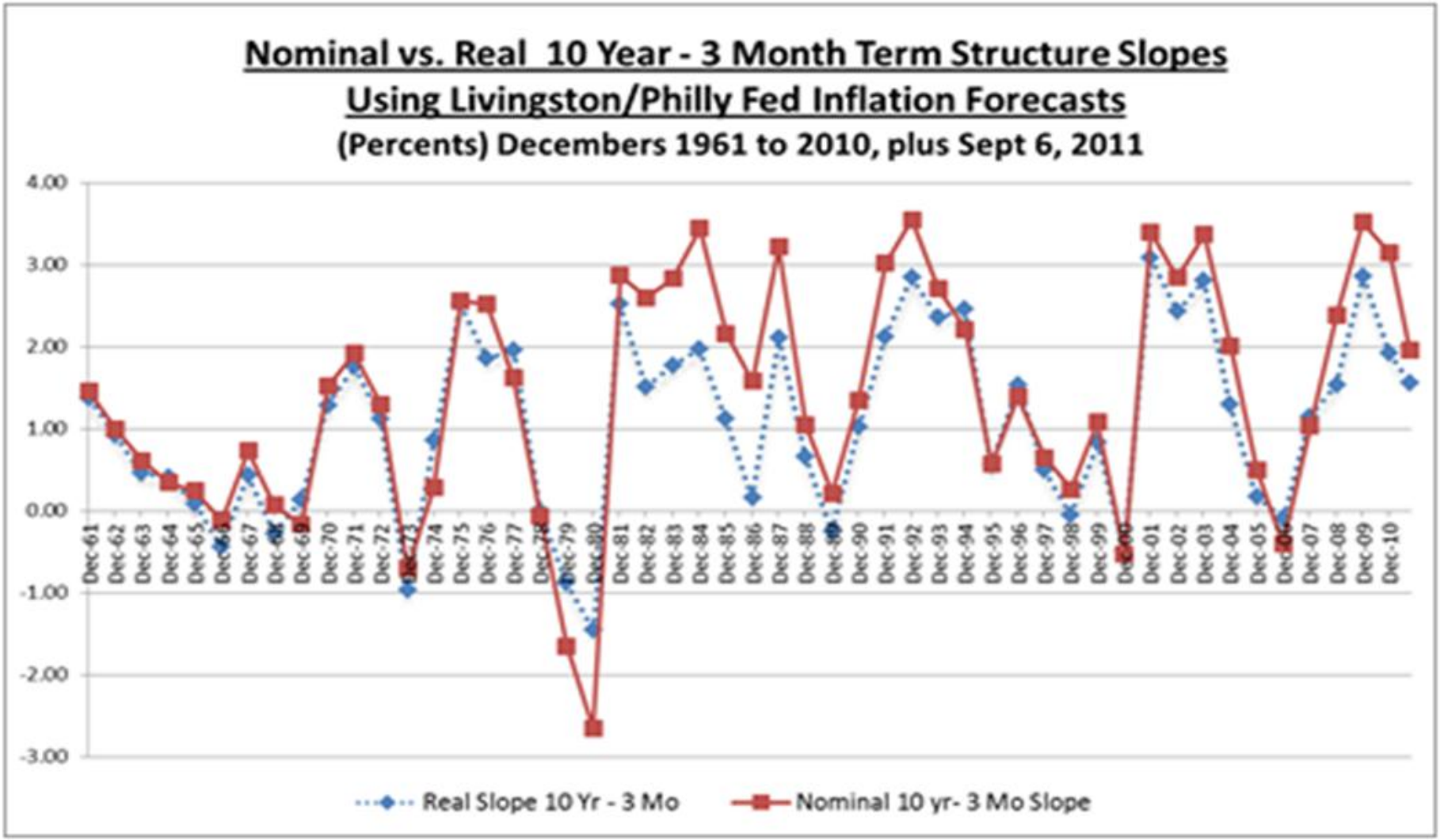
Implied R^2 (from RMSE Reduction) of Macro Variables on Stocks, Slope, and Consumption Deviations

1961-2011 Q2 Semiannual data. Includes lagged Y.

Consumption Deviations Help Predict Future Wages and Personal Income

Variable (Y_t)	RlStock Return Only, Lg1,Lg2	Stock+ TS Slope 10y-3m Lag 1	Stock+ Slope+ PCETot Devn, Lg12	Stock+ Slope+ PCENDS DevnLg12	Leading Economic Indicators, Lg1, Lg2
Real Personal Income-Transfers, 6m % Growth	0.15	0.11	0.19	0.21	.11
Real Personal Income-Transfers, 2Q % Growth	0.35	0.31	0.36	0.37	.25
Real Wages, RMSE 6 mo % Grwth	-0.04	-0.08	0.04	0.06	.01
Real Wages, 2Q % Growth	0.40	0.38	0.44	0.45	.36

Figure 21


Nominal vs. Real 10 Year - 3 Month Term Structure Slopes
Using Livingston/Philly Fed Inflation Forecasts
(Percents) Decembers 1961 to 2010, plus Sept 6, 2011
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
Dec-61
Dec-62
Dec-63
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Dec-08
Dec-09
Dec-10
Real Slope 10 Yr - 3 Mo
Nominal 10 yr- 3 Mo Slope

Figure 22: Comparison of Out of Sample Forecasts for Real vs. Nominal Term Structure Slopes: Implied R^2 (from RMSE Reduction) for Macro Variables on Stock Returns, Real Term Structure Slope (Livingston/Philly Fed Forecasts), and Real Consumption Deviations, 1961-2011 Q2 Semiannual data. Includes lag Y.

Variable (Y_t)	Real Stock+ Slope+ PCETot Devn, Lg12		Stock+ Slope+ PCENDS DevnLg12		Leading Economic Indicators, Lg1, Lg2
	Nominal	Real	Nominal	Real	
Unemployment Rate 6 month change	0.53	0.54	0.54	0.545	.46
Total Employment, 6 month % Growth	0.46	0.49	0.48	0.50	.43
Real GDP 2Q% Growth	0.26	0.27	0.26	0.27	.23
Industrial Production, 6 month % Growth	0.32	0.39	0.31	0.38	.30
Real Personal Income- Transfers, 6m % Growth	0.19	0.25	0.21	0.28	.11
Real Personal Income- Transfers, 2Q % Growth	0.36	0.38	0.37	0.39	.25
Real Wages, RMSE 6 mo % Grwth	0.04	0.07	0.06	0.09	.01
Real Wages, 2Q % Growth	0.44	0.45	0.45	0.47	.36

Conclusion on Consumption Deviations and the Income and Investment Opportunity Sets

- 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.

- Lettau and Ludvigson (2001a,b) showed that deviations of consumption from its normal relationship with wealth and wages are also significantly and positively related to subsequent investment returns.

- Consumption deviations from wealth are a leading indicator.

A Stock, Bonds, Consumers Leading Indicator (SBCLI)

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

	Advanced Americas				Advanced Europe				Advanced AustralAsia			
	Lg1Stocks	Lg2Stocks	Lg1Slope	Lg1CPerp	Lg1Stocks	Lg2Stocks	Lg1Slope	Lg1CPerp	Lg1Stocks	Lg2Stocks	Lg1Slope	Lg1CPerp
Regression Coefficients with Z-Score Variables												
Real GDP Growth	1.23	0.59	0.88	0.61	0.85	0.38	0.48	0.66	1.05	0.10	-0.03	0.72
Industrial Production	3.00	1.25	2.02	0.88	1.86	1.06	1.68	1.26	3.27	0.85	1.77	2.66
Unemployment Rate Change	-0.32	-0.13	-0.18	-0.16	-0.11	-0.07	-0.07	-0.12	-0.07	-0.05	-0.02	-0.05
Employment Growth	0.65	0.43	0.32	0.61	0.25	0.21	0.18	0.28	0.18	0.18	0.03	0.15
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 SBCLI index proposed is:

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

Stocks, Bonds, Consumers Leading Indicator (SBCLI)

United States

Douglas T. Breeden, March 2012

Massachusetts Institute of Technology and Duke University

1 Quarter Prior SBCLI Forecast Correlations

SBCLI Correl=	**0.79**	**0.84**
SBCLI MA2	**0.79**	**0.89**

2 Quarters Prior SBCLI Forecast Correlations

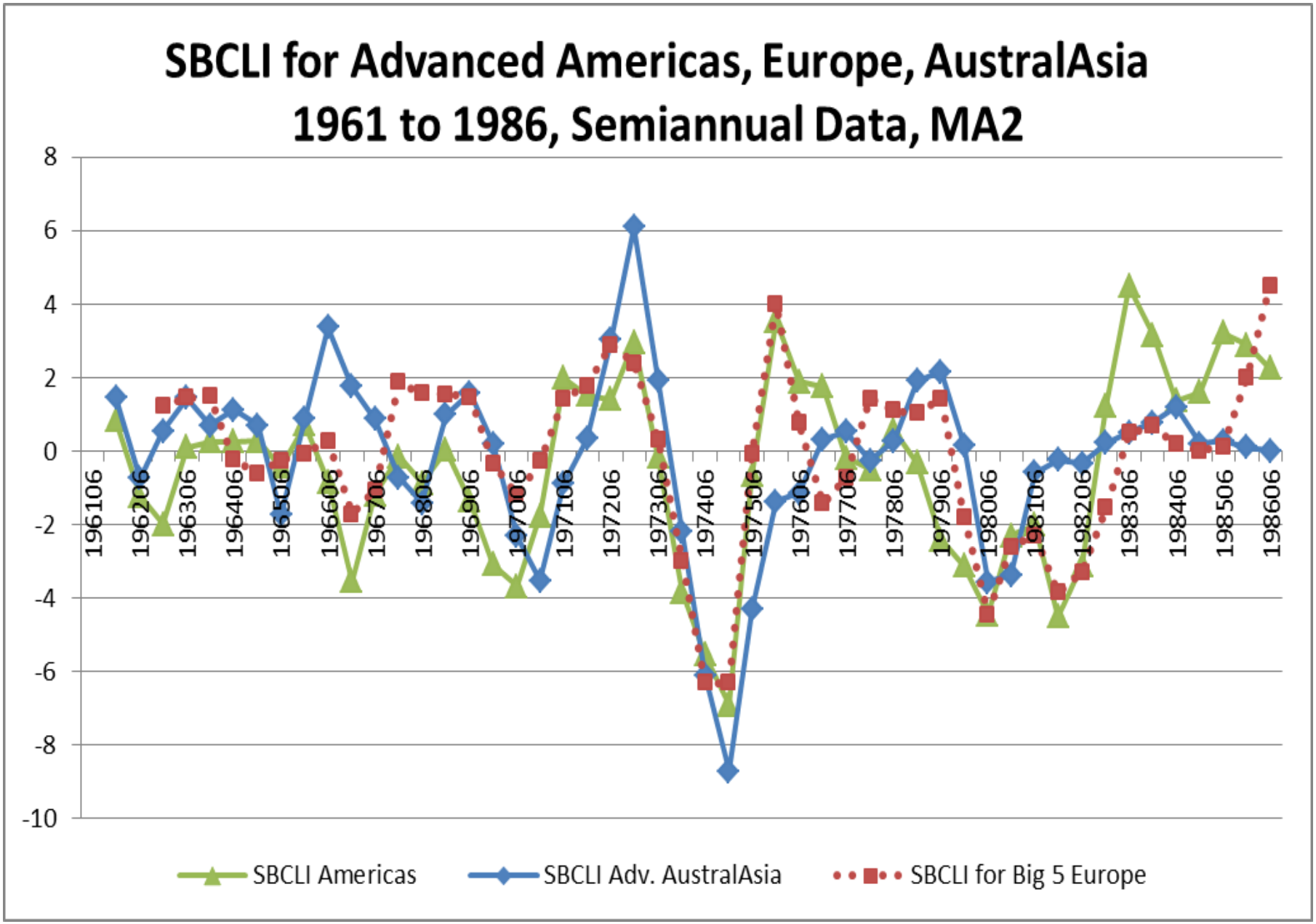
SBCLI Correl=	**0.68**	**0.81**
SBCLI MA2	**0.61**	**0.73**

1961 to 2	RlStok	Slope	Cperp	LEI
Mean	2	1.18	0	2.9
StdDevr	11.4	1.23	1.7	6.0

Real Consumption Growth From 2Q Stock Returns:

Const	Trend	RlStock	Lg1Stoc	Lg2 Stock
-0.38	1	0.093	0.058	0.041

	Stock Market				**Bond Market**				**Consumers (Total)**					**SBCLI**		**Macroeconomic Data**			
					Yield	Yield	Yield	Yield	RealTot	20 Yr	Expecte	Consumption		SBCLI	SBCLI	Real			
		Inflation	Stocks	Real	Treasy	Treasy	Curve	Curve	Consum	Real	RlGrowt	Deviatic	PCETotal		MA2	GDP	Indust	Employr	Unemply
	OECD	OECD	RealRet	StkRet	Short	LongRa	Slope	Slope	Growth	Growth	PCETot	PCETotal		Total	Total	Growth	Prodn	Growth	Rate
Quarter	QAvg	YoY	L 2Qtrs	Zscore	MoAvg	MoAvg		Zscore	2Q%Anr	Trend	FromStk	2Q%Anr	Zscore	Zscore	Zscore	2QAnn%	2QAnn%	2QAnn%	%
200612	120.6	1.9	6.8	**0.4**	5.32	4.63	-0.69	**-1.5**	**3.1**	3.0	3.8	-0.8	**-0.4**	**-1**	**-2**	1.4	1.4	2.2	4.4
200703	125.2	2.4	10.2	**0.7**	5.31	4.68	-0.63	**-1.5**	3.0	**3.0**	3.9	-0.9	**-0.5**	**-1**	**-1**	1.6	2.7	2.2	4.5
200706	132.8	2.7	8.7	**0.6**	5.32	4.85	-0.47	**-1.3**	1.9	3.0	4.1	-2.2	**-1.3**	**-1**	**-1**	2.1	4.5	0.4	4.5
200709	132.5	2.4	4.6	**0.2**	5.42	4.73	-0.69	**-1.5**	1.7	3.0	3.7	-2.0	**-1.2**	**-2**	**-2**	3.3	2.8	-0.2	4.7
200712	134.7	4.0	-0.5	**-0.2**	5.02	4.26	-0.76	**-1.6**	1.5	3.0	3.3	-1.8	**-1.1**	**-3**	**-3**	2.3	0.6	0.6	4.8
200803	122.4	4.1	-9.7	**-1.0**	3.23	3.66	0.43	**-0.6**	0.1	2.9	2.3	-2.2	**-1.3**	**-4**	**-4**	0.0	-0.5	0.4	5.0
200806	125.2	4.4	-9.3	**-1.0**	2.76	3.89	1.13	**0.0**	-0.6	2.9	1.9	-2.5	**-1.5**	**-4**	**-4**	-0.2	-4.0	-0.4	5.3
200809	111.9	5.3	-11.2	**-1.2**	3.06	3.86	0.81	**-0.3**	-2.0	2.8	1.0	-3.0	**-1.8**	**-4**	**-4**	-1.2	-9.7	-1.4	6.0
200812	77.9	1.6	-38.5	**-3.6**	2.82	3.25	0.44	**-0.6**	-4.5	2.7	-1.9	-2.7	**-1.6**	**-9**	**-7**	-6.4	-14.5	-2.7	6.9
200903	69.3	0.0	-38.1	**-3.5**	1.08	2.74	1.65	**0.4**	-3.4	2.5	-2.5	-0.9	**-0.5**	**-7**	**-8**	-7.9	-18.1	-5.1	8.3
200906	77.8	-1.2	0.4	**-0.1**	0.62	3.31	2.70	**1.2**	-1.7	2.4	-0.5	-1.2	**-0.7**	**0**	**-3**	-3.8	-15.9	-5.1	9.3
200909	88.2	-1.6	28.2	**2.3**	0.30	3.52	3.22	**1.7**	0.2	2.4	2.0	-1.8	**-1.0**	**5**	**3**	0.5	-3.5	-3.2	9.6
200912	96.3	1.4	23.1	**1.9**	0.22	3.46	3.24	**1.7**	1.4	2.4	2.6	-1.2	**-0.7**	**5**	**5**	2.7	5.4	-2.8	9.9
201003	97.8	2.4	9.7	**0.7**	0.21	3.72	3.51	**1.9**	1.6	2.4	3.0	-1.4	**-0.9**	**2**	**4**	3.8	6.7	-1.0	9.8
201006	97.0	1.8	-0.2	**-0.2**	0.42	3.49	3.07	**1.5**	2.8	2.4	3.4	-0.6	**-0.3**	**1**	**2**	3.8	7.5	1.4	9.6
201009	94.7	1.2	-3.7	**-0.5**	0.34	2.79	2.45	**1.0**	2.8	2.5	3.4	-0.7	**-0.4**	**0**	**0**	3.1	6.8	1.0	9.5
201012	104.0	1.3	6.6	**0.4**	0.28	2.86	2.58	**1.1**	3.1	2.5	3.7	-0.6	**-0.4**	**2**	**1**	2.4	4.8	-0.4	9.6
201103	112.2	2.1	17.4	**1.3**	0.28	3.46	3.18	**1.6**	2.8	2.6	4.0	-1.2	**-0.7**	**4**	**3**	1.3	3.9	0.4	9.0
201106	113.4	3.4	7.3	**0.5**	0.22	3.21	2.99	**1.5**	1.4	2.6	3.2	-1.9	**-1.1**	**1**	**2**	0.8	2.7	0.8	9.0
201109	103.2	3.8	-10.0	**-1.0**	0.29	2.43	2.14	**0.8**	1.2	2.6	2.1	-0.9	**-0.5**	**-2**	**0**	1.6	3.4	0.2	9.1
201112	99.7	3.3	-13.7	**-1.4**	0.42	2.05	1.62	**0.4**	1.9	2.6	1.6	0.3	**0.2**	**-2**	**-2**	2.3	5.0	1.4	8.7
201203			15.2	**1.2**	0.47	2.28	1.81	**0.5**		2.6	3.7		*0.2*	***3***	***0***				8.3


SBCLI for Advanced Americas, Europe, AustralAsia
1961 to 1986, Semiannual Data, MA2
8
6
4
2
0
-2
-4
-6
-8
-10
196106
196206
196306
196406
196506
196606
196706
196806
196906
197006
197106
197206
197306
197406
197506
197606
197706
197806
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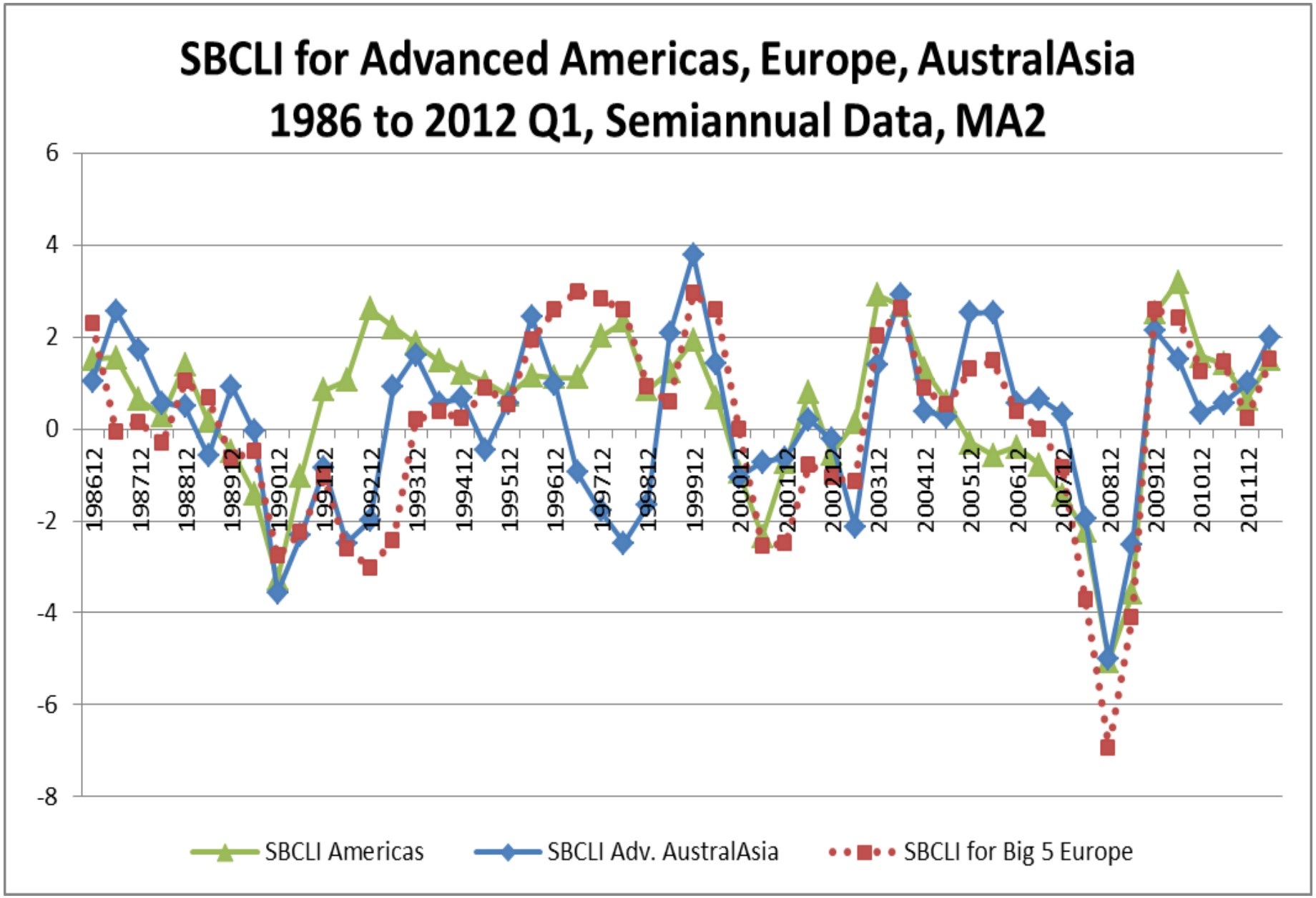
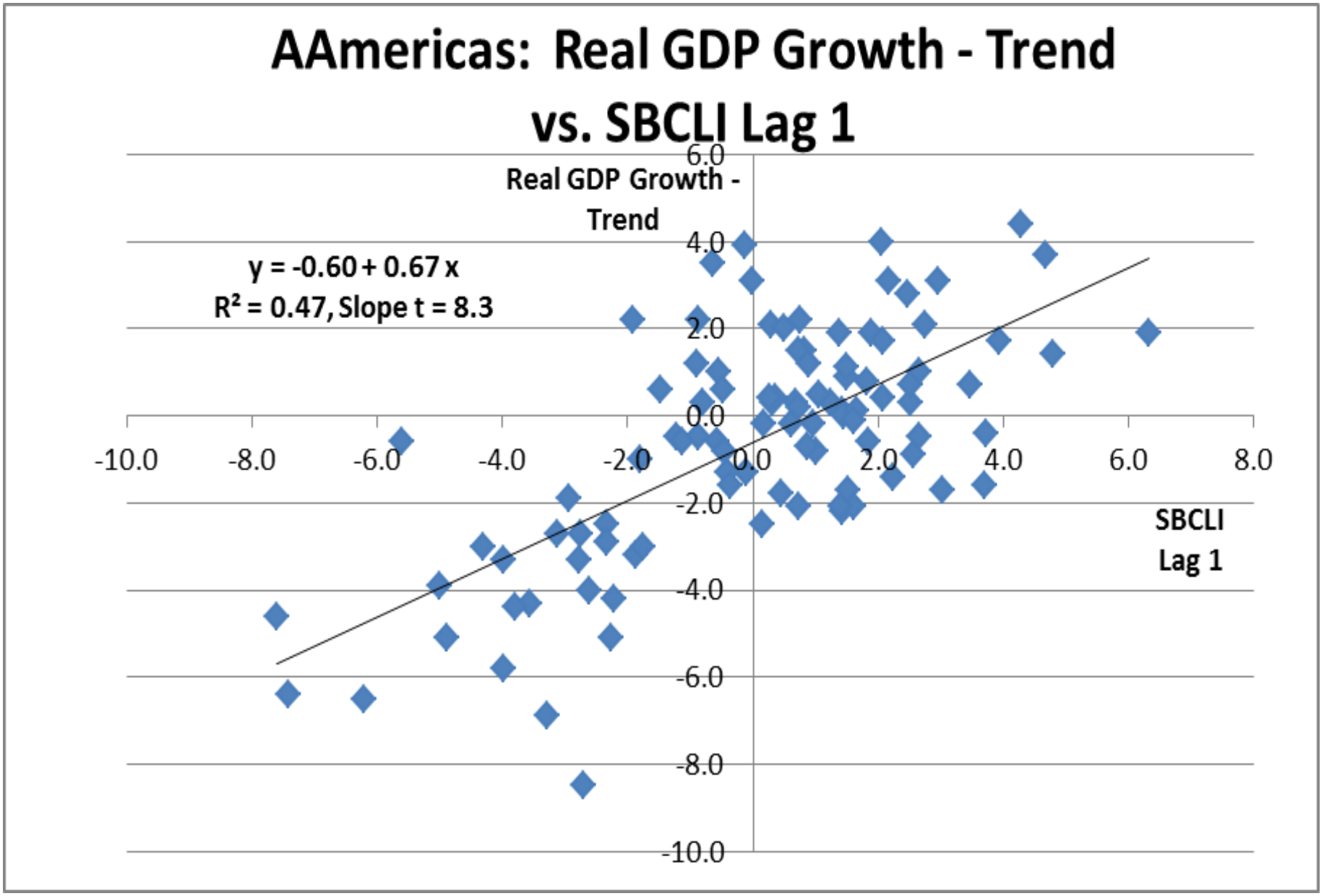
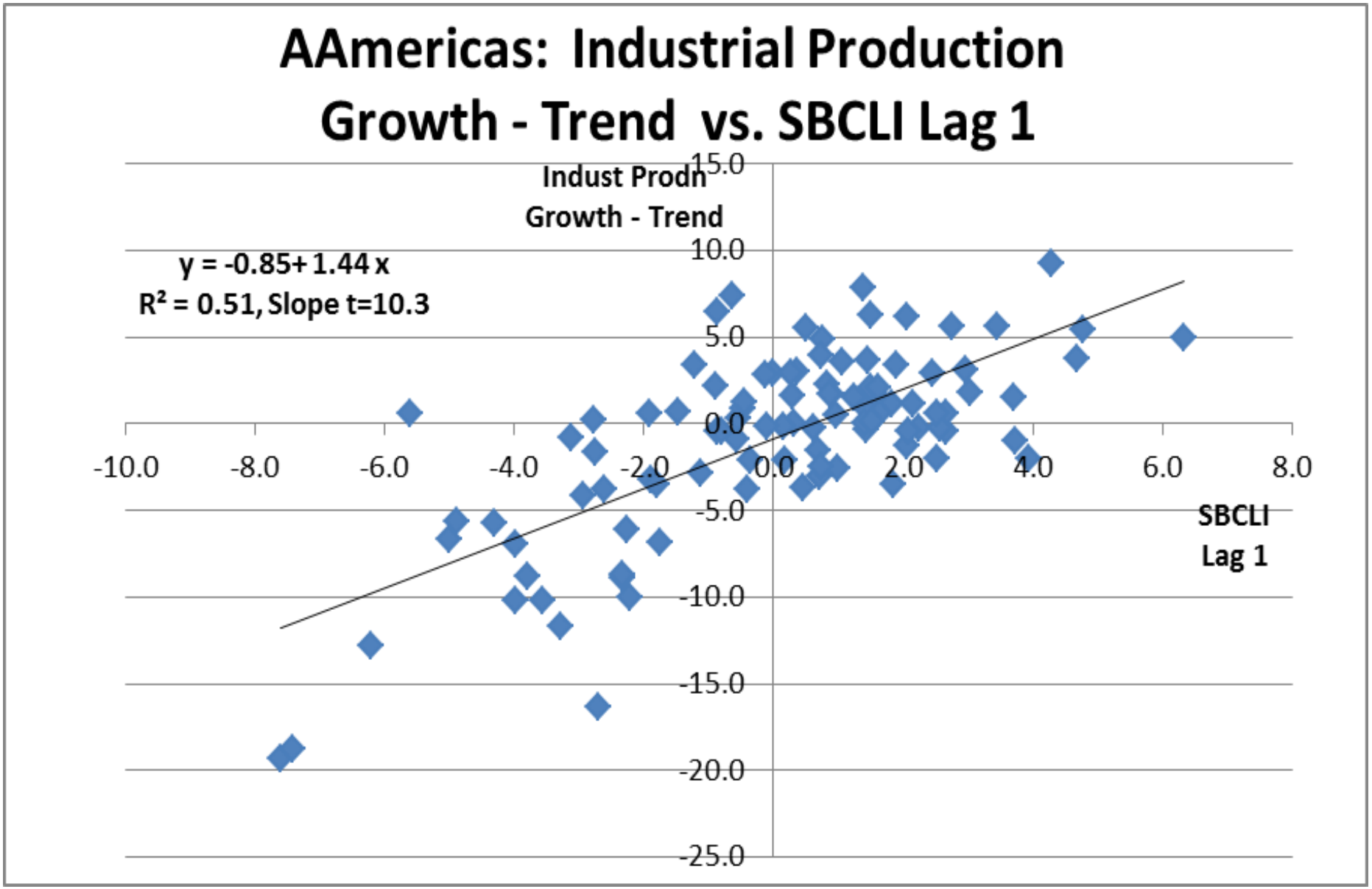
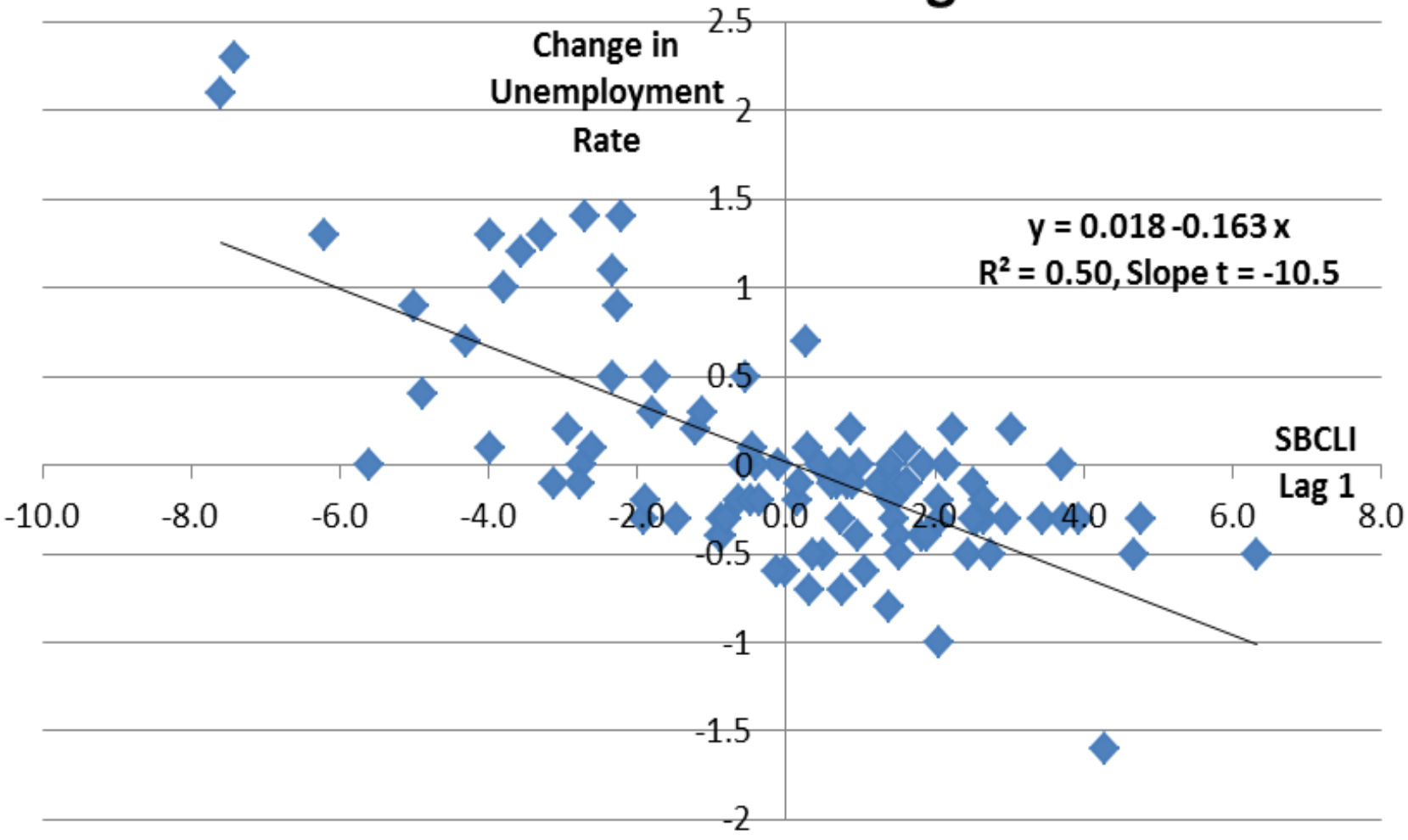
198506
198606
SBCLI Americas
SBCLI Adv. AustralAsia
SBCLI for Big 5 Europe


SBCLI for Advanced Americas, Europe, AustralAsia
1986 to 2012 Q1, Semiannual Data, MA2
6
4
2
0
-2
-4
-6
-8
198612
198712
198812
198912
199012
199112
199212
199312
199412
199512
199612
199712
199812
199912
200012
200112
200212
200312
200412
200512
200612
200712
200812
200912
201012
201112
SBCLI Americas
SBCLI Adv. AustralAsia
SBCLI for Big 5 Europe

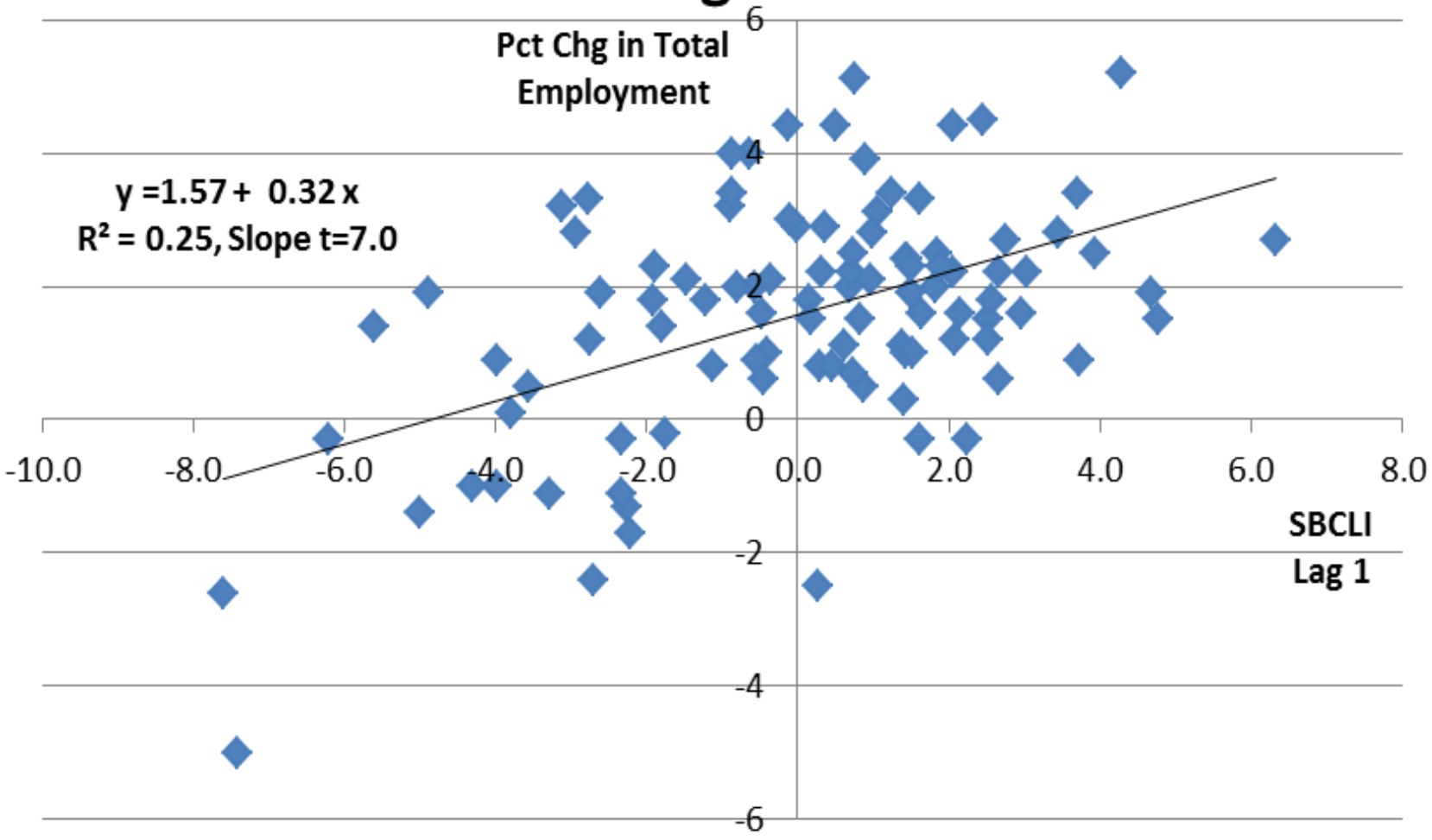

AAmericas: Real GDP Growth - Trend vs. SBCLI Lag 1
Real GDP Growth - Trend
y = -0.60 + 0.67 x
R² = 0.47, Slope t = 8.3
SBCLI Lag 1
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
-10.0
-8.0
-6.0
-4.0
-2.0
0.0
2.0
4.0
6.0
8.0


AAmericas: Industrial Production Growth - Trend vs. SBCLI Lag 1
Indust Prodn Growth - Trend
y = -0.85+ 1.44 x
R² = 0.51, Slope t=10.3
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-10.0
-8.0
-6.0
-4.0
-2.0
0.0
2.0
4.0
6.0
8.0
SBCLI Lag 1

Adv Americas: Unemployment Rate Change vs. SBCLI Lag 1



Adv Americas: Total Employment Growth vs. SBCLI Lag 1



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

Americas: Macro Variables Regressed on SBCLI and LEI Lagged Z-Scores:

Stocks, Bonds, Consumers vs. USA & OECD Leading Indicators 1962-2011, Semiannual

Macro Var = Y_t	Indicator Name	Constnt	Y_{t-1}	t-stat	Trend Real Growth	t-stat	Indic Lag 1 Coef = X_{t-1}	t-stat	Indic Lag 2 Coef = X_{t-2}	t-stat	Corr. R^2
Rl GDP 2Q %Chg	SBCLI LEI USA LEI OECD	-1.97 -0.04 1.60			1.36 0.87 0.40	6.7 3.9 1.8	0.61 1.68 1.75	8.3 7.2 8.3	0.24 0.18 0.18	3.4 0.8 0.8	.57 .47 .50
IndProdn 2Q %Chg	SBCLI LEI USA LEI OECD	-6.85 -2.54 1.39			2.60 1.50 0.38	7.1 3.8 1.0	1.35 3.77 4.02	10.3 9.0 11.0	0.50 0.55 0.59	3.8 1.3 1.6	.65 .57 .63
d Unem-ploymen t Rate 2Q	SBCLI LEI USA LEI OECD	0.65 0.15 -0.23	0.14 0.23 0.23	1.6 2.3 2.4	-0.17 -0.04 0.07	-4.2 -0.9 1.5	-0.14 -0.38 -0.41	-10.5 -8.3 -9.8	-0.07 -0.04 -0.03	-3.5 -0.6 -0.5	.70 .59 .63
Employ-ment 2Q %Chg	SBCLI LEI USA LEI OECD	-1.64 -0.47 0.37	0.23 0.38 0.35	2.8 4.2 3.9	0.77 0.41 0.18	5.7 2.9 1.4	0.30 0.94 1.01	7.0 6.8 8.4	0.19 -0.06 -0.02	3.7 -0.4 -0.1	.64 .55 .61

Europe: Macro Variables Regressed on SBCLI and LEI Lagged Z-Scores:

Stocks, Bonds, Consumers vs. USA & OECD Leading Indicators 1963-2011, Semiannual

Macro Var = Y_t	Indicator Name	Constnt	Y_{t-1}	t-stat	Trend Real Growth	t-stat	Indic Lag 1 Coef = X_{t-1}	t-stat	Indic Lag 2 Coef = X_{t-2}	t-stat	Corr. R^2
Rl GDP 2Q %Chg	SBCLI LEI OECD	-0.36 0.90			0.95 0.55	6.9 3.6	0.43 1.22	8.3 7.6	0.18 0.27	3.4 1.6	.61 .56
IndProdn 2Q %Chg	SBCLI LEI OECD	-1.76 1.41			1.29 0.30	3.7 0.9	1.05 3.54	7.9 9.8	0.42 0.26	3.1 0.7	.53 .59
d Unem-ploymen t Rate 2Q	SBCLI LEI OECD	-0.02 -0.18	0.44 0.59	5.6 7.8	0.02 0.07	0.7 2.7	-0.057 -0.19	-6.2 -7.4	-0.027 -0.00	-2.5 -0.1	.61 .64
Employ-ment 2Q %Chg	SBCLI LEI OECD	0.78 1.08	0.48 0.58	6.1 7.2	-0.17 -0.28	-2.1 -3.1	0.14 0.39	4.4 4.1	0.09 0.12	2.5 1.2	.55 .51

AustAsia: Macro Variables Regressed on SBCLI and LEI Lagged Z-Scores:

Stocks, Bonds, Consumers vs. USA & OECD Leading Indicators 1962-2010, Semiannual

Macro Var = Y_t	Indicator Name	Constnt	Y_{t-1}	t-stat	Trend Real Growth	t-stat	Indic Lag 1 Coef = X_{t-1}	t-stat	Indic Lag 2 Coef = X_{t-2}	t-stat	Corr. R^2
Rl GDP 2Q %Chg	SBCLI LEI OECD	-1.00 0.90			0.90 0.55	8.2 3.6	0.44 1.22	3.7 7.6	0.02 0.27	0.2 1.6	.45 .56
IndProdn 2Q %Chg	SBCLI LEI OECD	-2.90 1.41			1.25 0.30	5.7 0.9	1.77 3.54	7.5 9.8	0.38 0.26	1.7 0.7	.51 .59
d Unem-ployment Rate 2Q	SBCLI LEI OECD	0.05 -0.08	0.15 0.14	1.5 1.4	-0.003 0.019	-0.5 2.5	-0.028 -0.108	-4.0 -4.9	-0.016 -0.019	-2.1 -0.7	.27 .32
Employ-ment 2Q%Ann	SBCLI LEI OECD	0.17 0.65	0.14 0.12	1.3 1.2	0.10 0.02	2.9 0.5	0.13 0.39	3.7 3.5	0.04 0.09	1.1 0.7	.26 .27
Employ-ment YoY%Chg	SBCLI LEI OECD	0.08 0.44	0.59 0.63	8.2 8.6	0.05 -0.02	2.3 -0.9	0.082 0.324	3.9 4.9	0.052 0.037	2.4 0.5	.62 .64

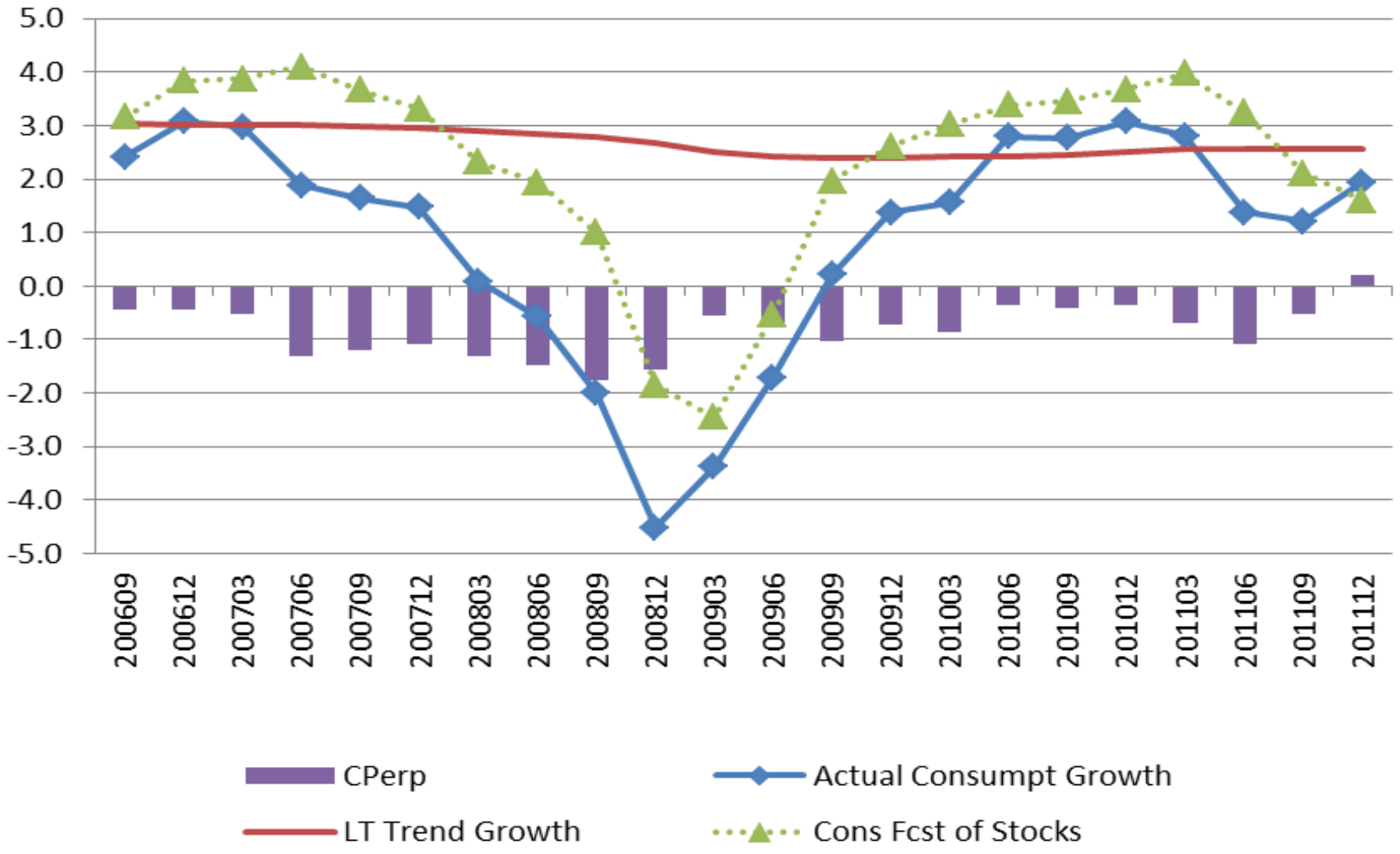
Out of Sample "Implied R-Squareds" 1977-2011 Q2 Simulation Performance of SBCLI vs. LEI

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

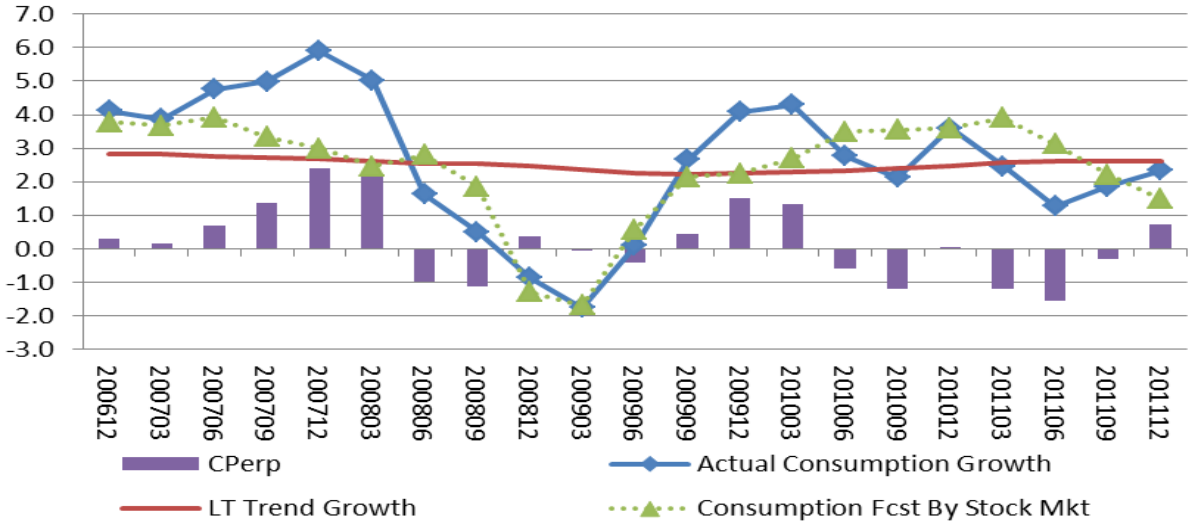
	Real GDP 2Q %Change	Ind. Prodn 2Q%Change	2Q Change in Unemployment Rate	Employment Growth, 2Q%
Adv Americas:				
SBCLI	0.55	0.54	0.63	0.59
USA LEI	0.37	0.42	0.47	0.49
OECD LEI	0.41	0.54	0.55	0.59
Advanced Europe SBCLI	0.57	0.43	0.58	0.65
OECD LEI	0.52	0.52	0.59	0.58
Adv AustralAsia				
SBCLI	0.40	0.42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

What are consumers saying now?

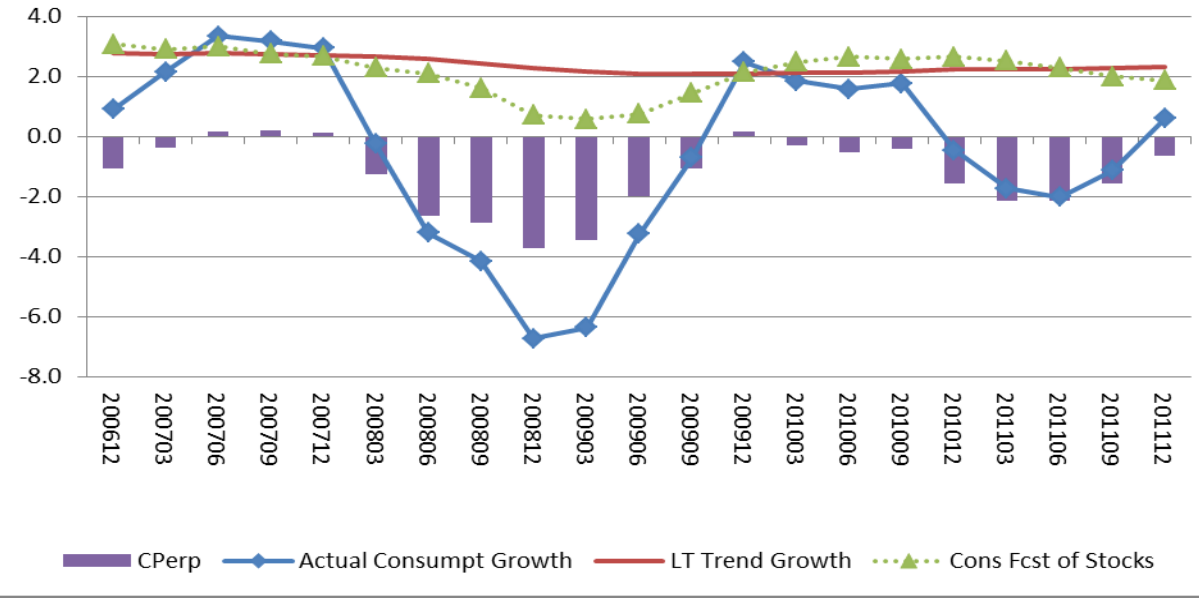
USA Consumer Signal Turns Positive: Consumption Growth vs. Stock Forecast



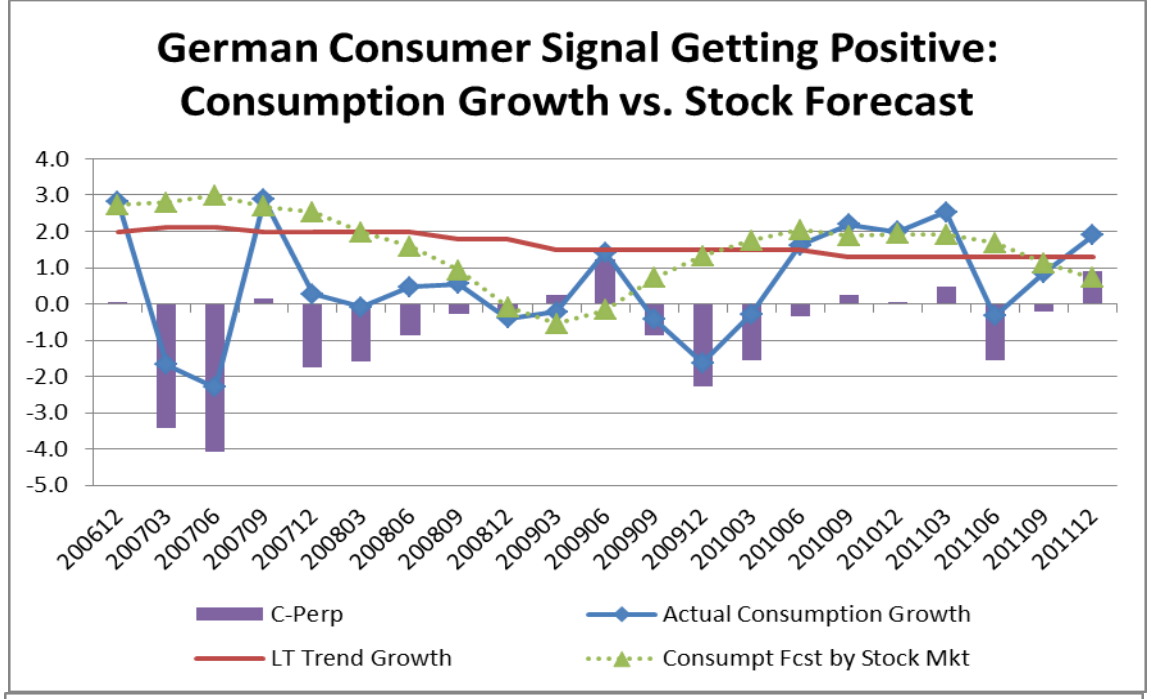
Canada: After Holding Back, Consumers Turn Positive



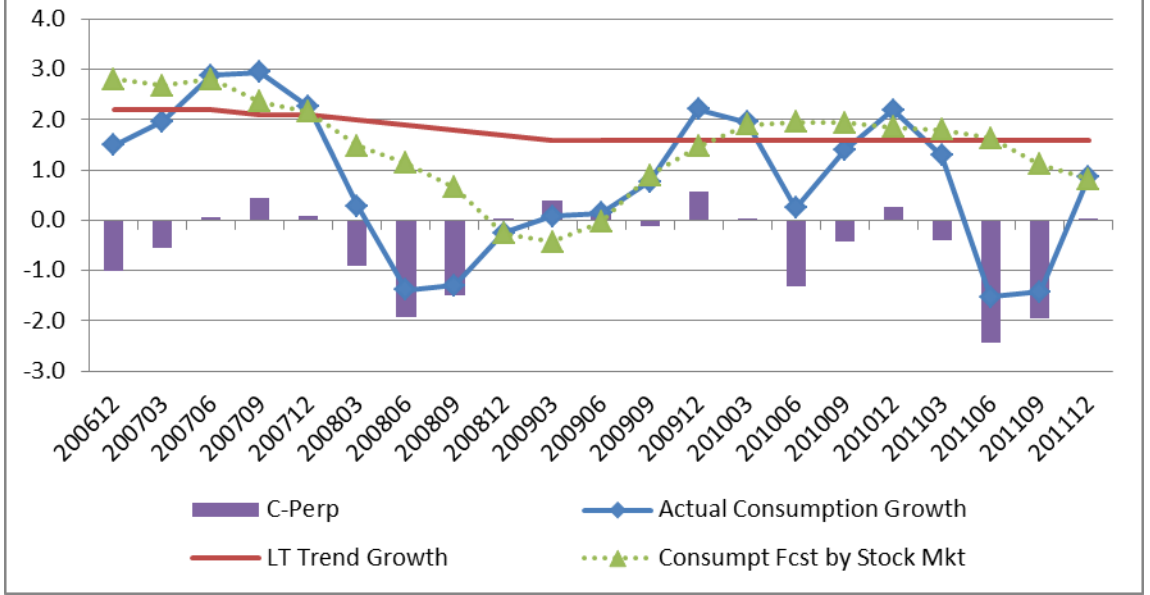
UK Consumers Still Negative, But Improving: Consumption Growth vs. Stock Forecast

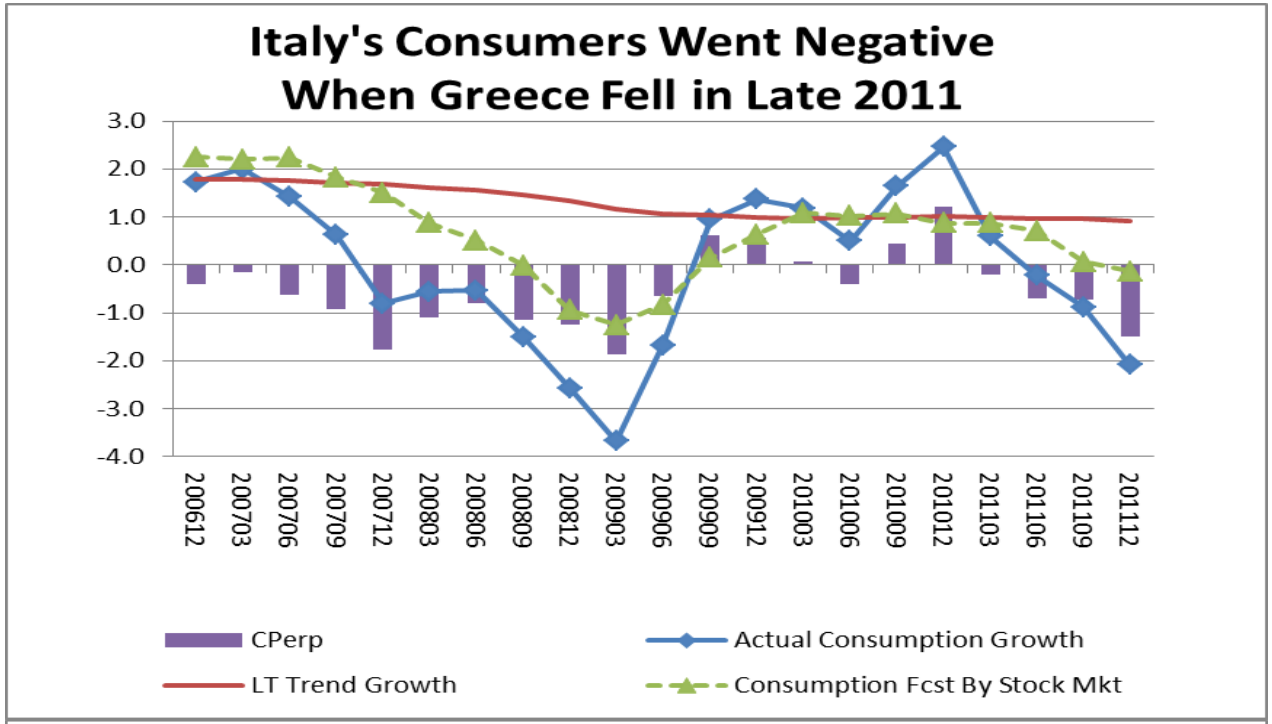


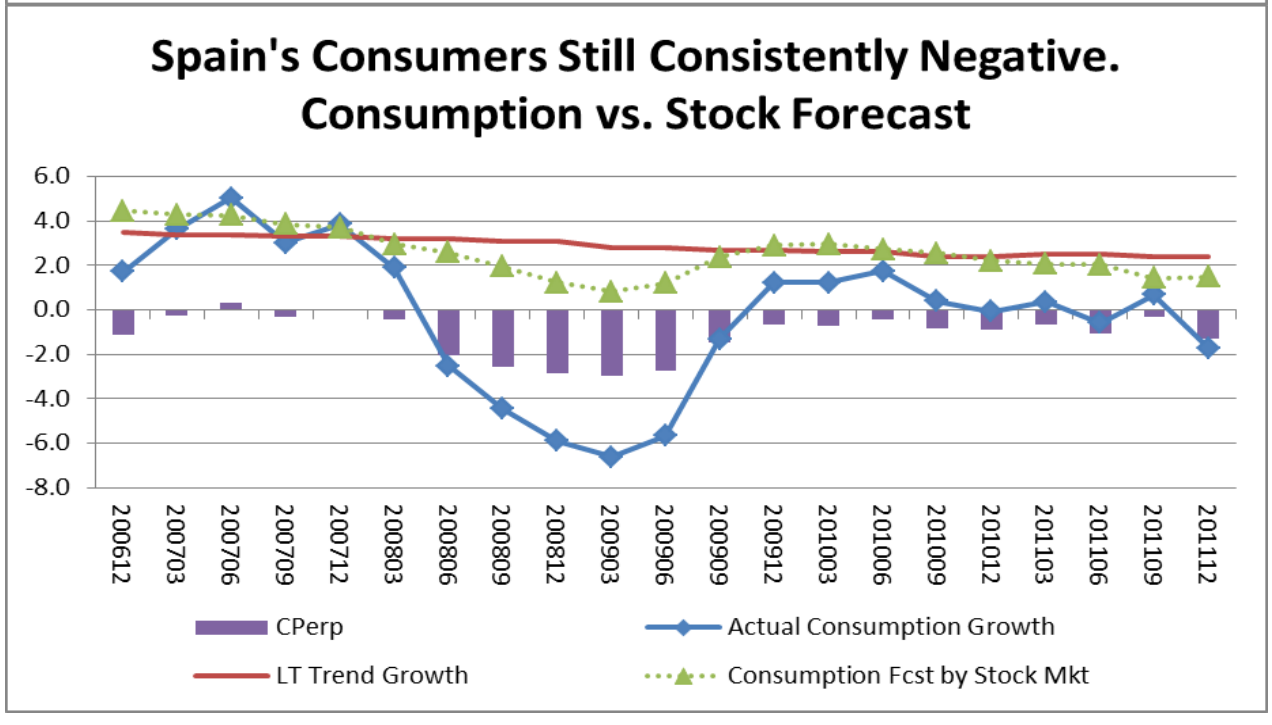
German Consumer Signal Getting Positive: Consumption Growth vs. Stock Forecast



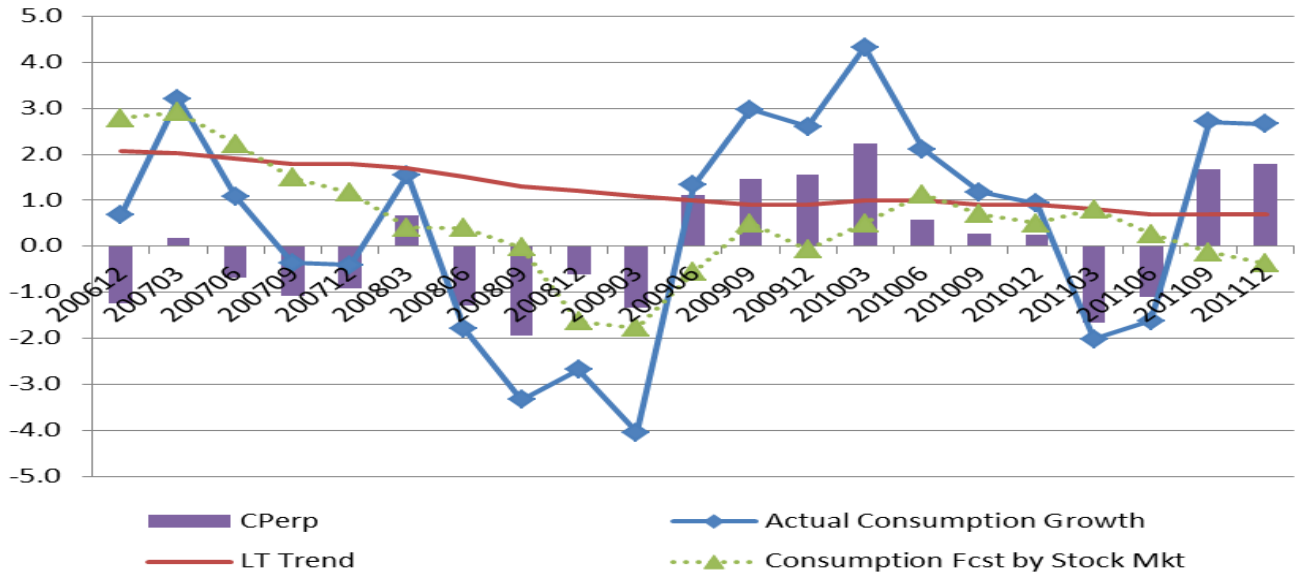
French Consumers Were Negative in 2011. Consumption Growth vs. Stock Forecast



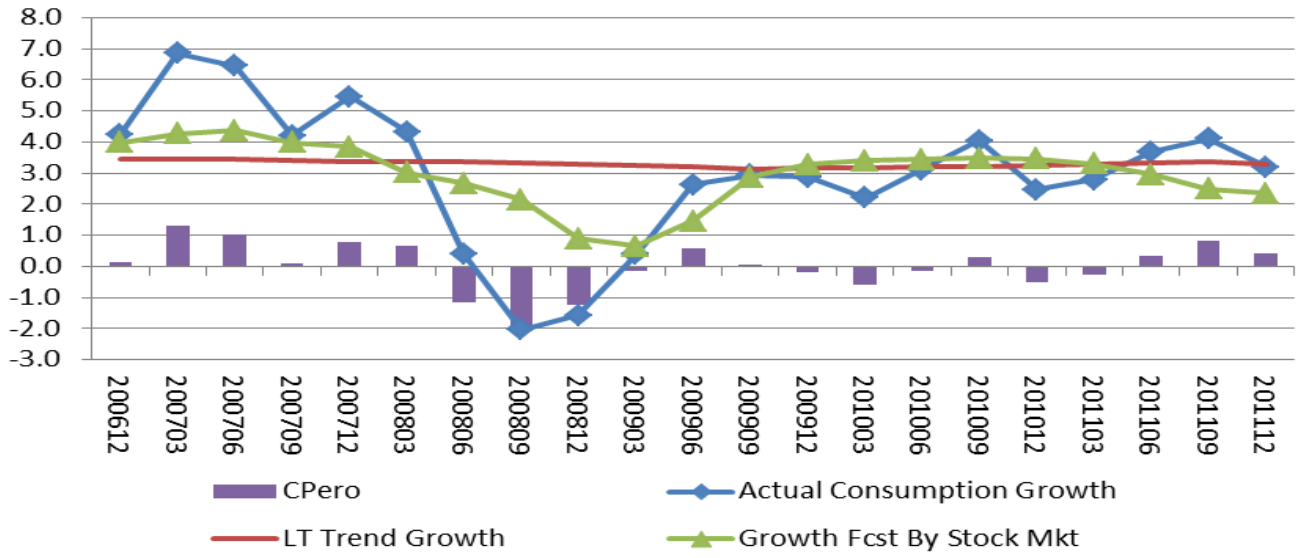

Italy's Consumers Went Negative
When Greece Fell in Late 2011
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
200612
200703
200706
200709
200712
200803
200806
200809
200812
200903
200906
200909
200912
201003
201006
201009
201012
201103
201106
201109
201112
CPerp
Actual Consumption Growth
LT Trend Growth
Consumption Fcst By Stock Mkt

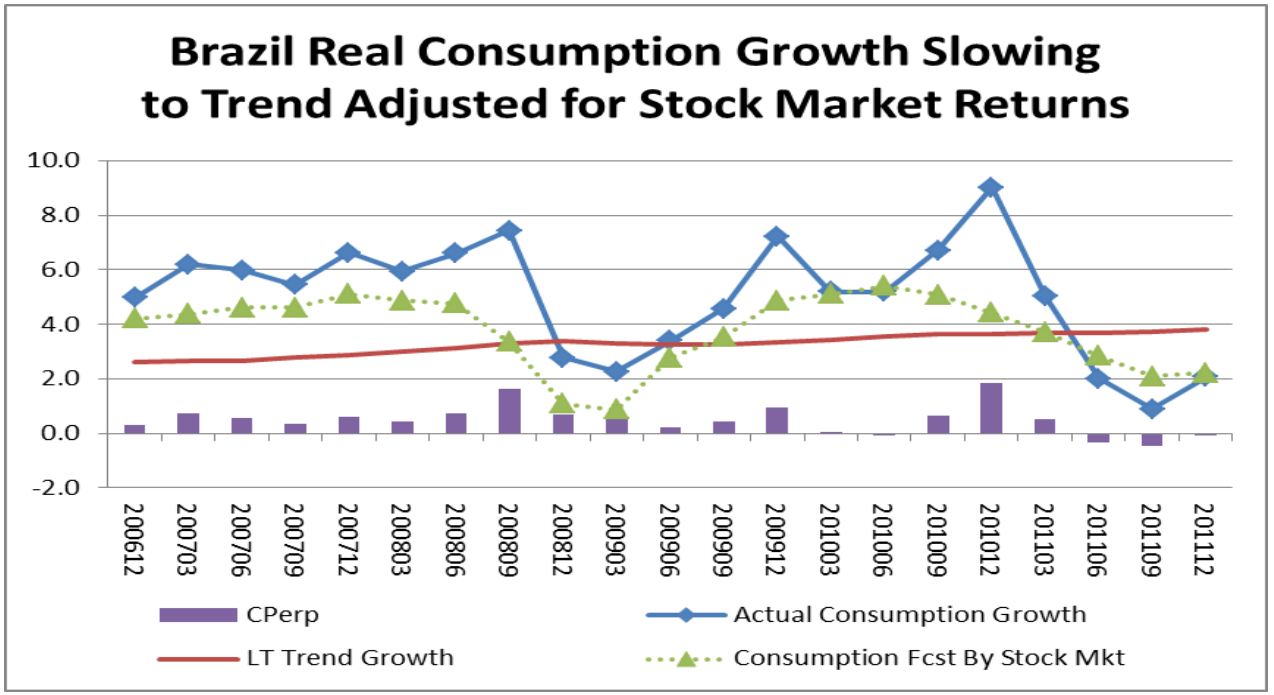

Spain's Consumers Still Consistently Negative.
Consumption vs. Stock Forecast
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
200612
200703
200706
200709
200712
200803
200806
200809
200812
200903
200906
200909
200912
201003
201006
201009
201012
201103
201106
201109
201112
CPerp
Actual Consumption Growth
LT Trend Growth
Consumption Fcst by Stock Mkt

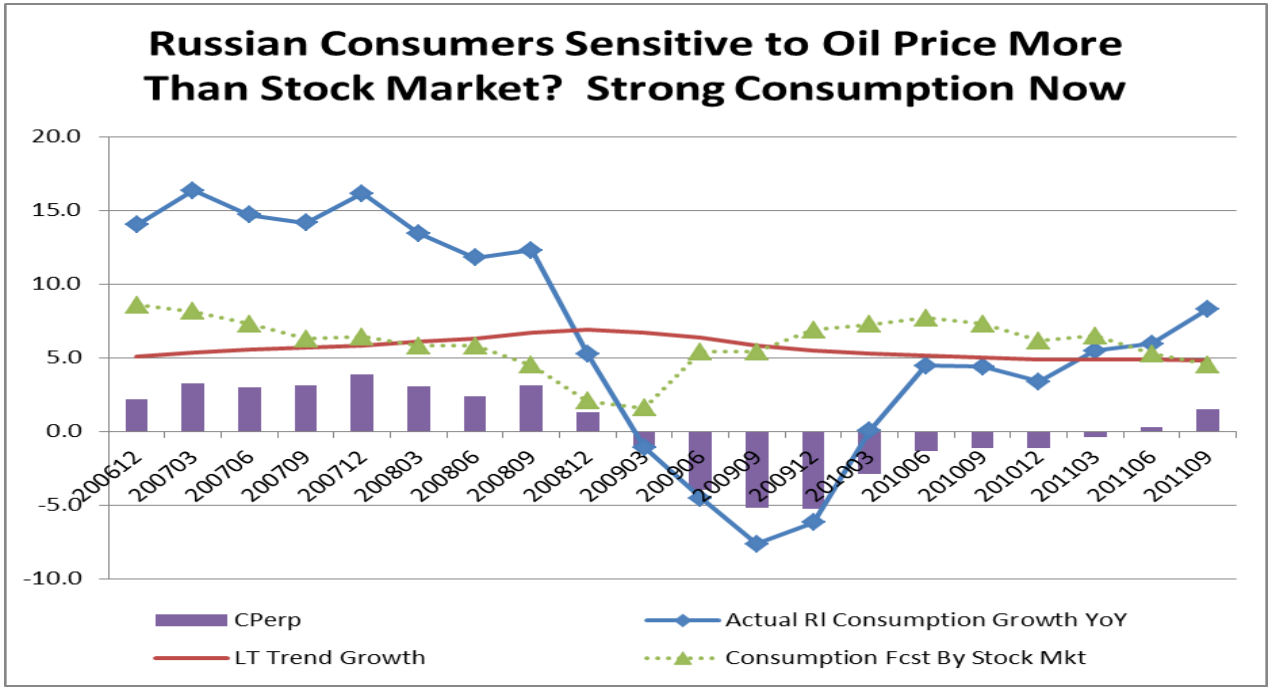
Japanese Consumer Signal Very Positive: Consumption Growth vs. Stock Forecast

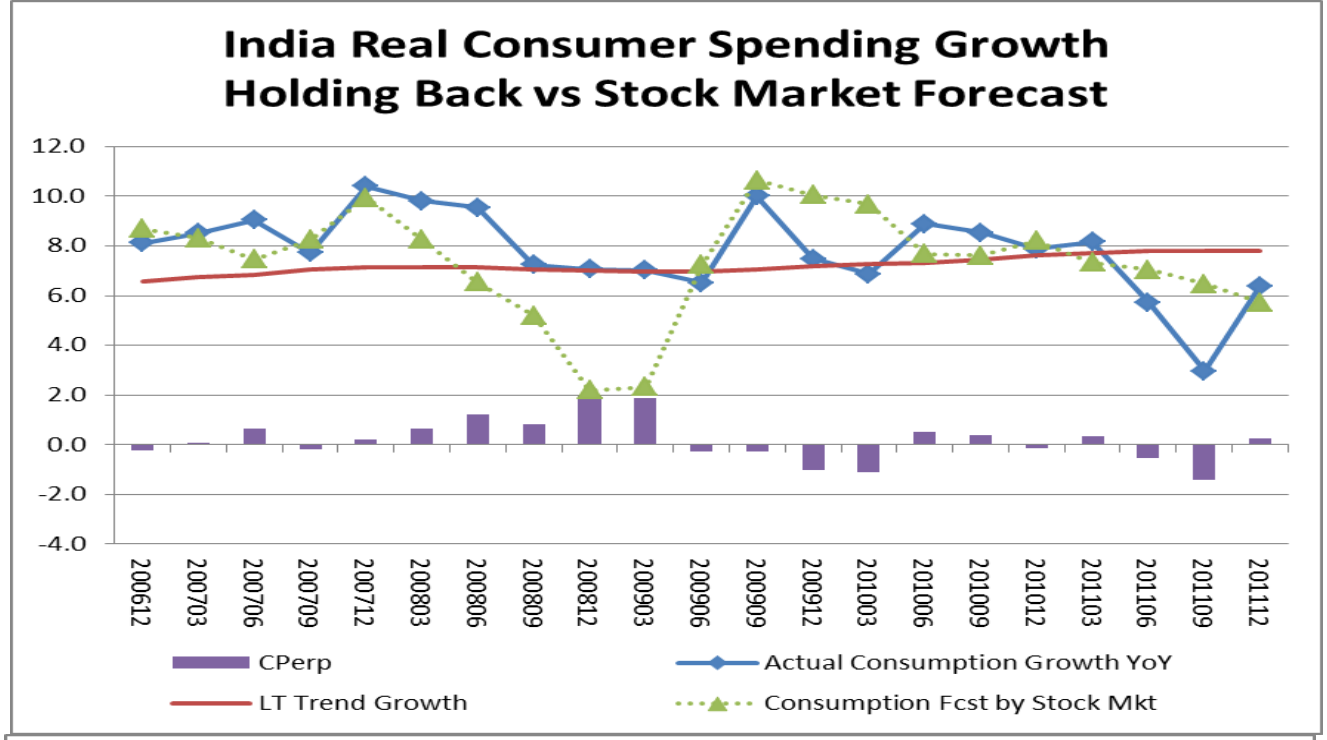


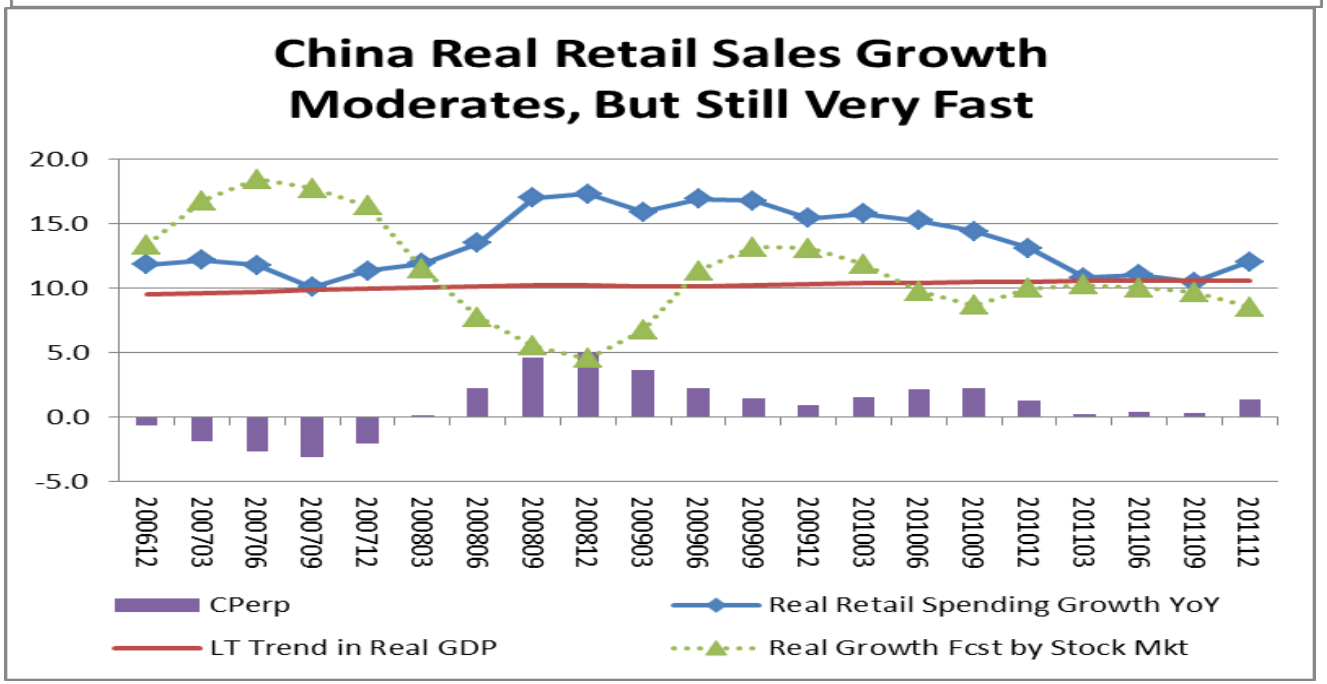
Australian Consumer Spending Looks Solid Consumption Growth vs. Stock Forecast



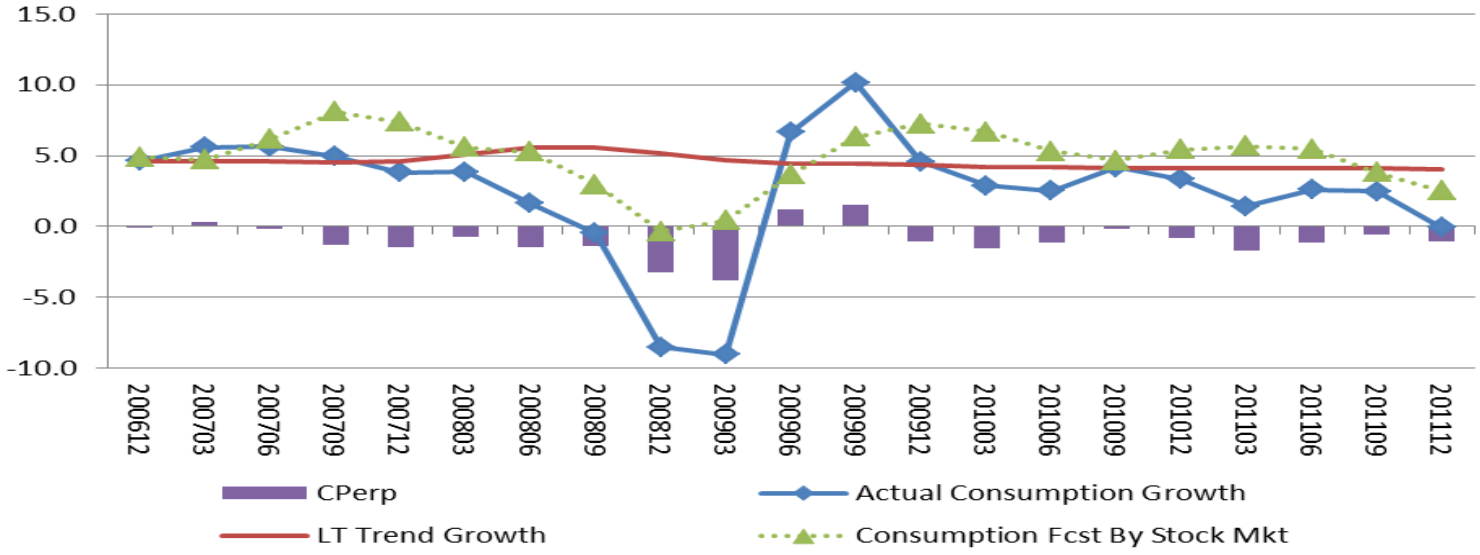

Brazil Real Consumption Growth Slowing to Trend Adjusted for Stock Market Returns
10.0
8.0
6.0
4.0
2.0
0.0
-2.0
200612
200703
200706
200709
200712
200803
200806
200809
200812
200903
200906
200909
200912
201003
201006
201009
201012
201103
201106
201109
201112
CPerp
Actual Consumption Growth
LT Trend Growth
Consumption Fcst By Stock Mkt


Russian Consumers Sensitive to Oil Price More Than Stock Market? Strong Consumption Now
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
200612
200703
200706
200709
200712
200803
200806
200809
200812
200903
200906
200909
200912
201003
201006
201009
201012
201103
201106
201109
CPerp
Actual RI Consumption Growth YoY
LT Trend Growth
Consumption Fcst By Stock Mkt

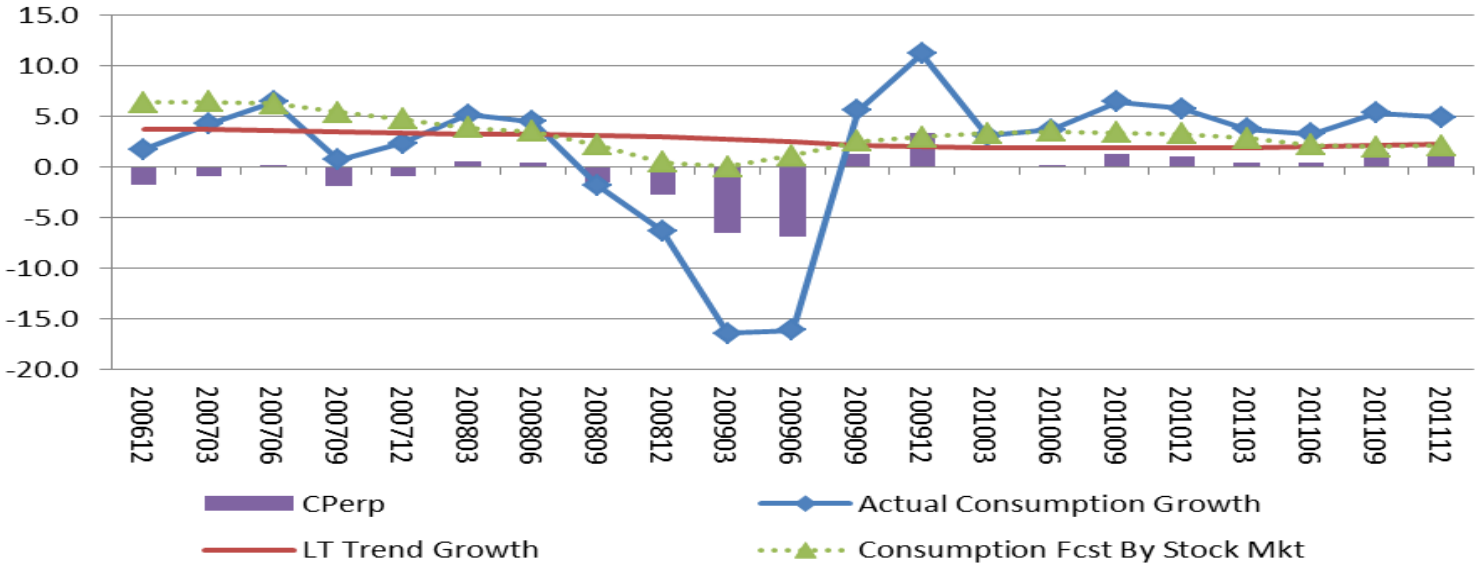

India Real Consumer Spending Growth
Holding Back vs Stock Market Forecast
12.0
10.0
8.0
6.0
4.0
2.0
0.0
-2.0
-4.0
200612
200703
200706
200709
200712
200803
200806
200809
200812
200903
200906
200909
200912
201003
201006
201009
201012
201103
201106
201109
201112
CPerp
Actual Consumption Growth YoY
LT Trend Growth
Consumption Fcst by Stock Mkt


China Real Retail Sales Growth
Moderates, But Still Very Fast
20.0
15.0
10.0
5.0
0.0
-5.0
200612
200703
200706
200709
200712
200803
200806
200809
200812
200903
200906
200909
200912
201003
201006
201009
201012
201103
201106
201109
201112
CPerp
Real Retail Spending Growth YoY
LT Trend in Real GDP
Real Growth Fcst by Stock Mkt

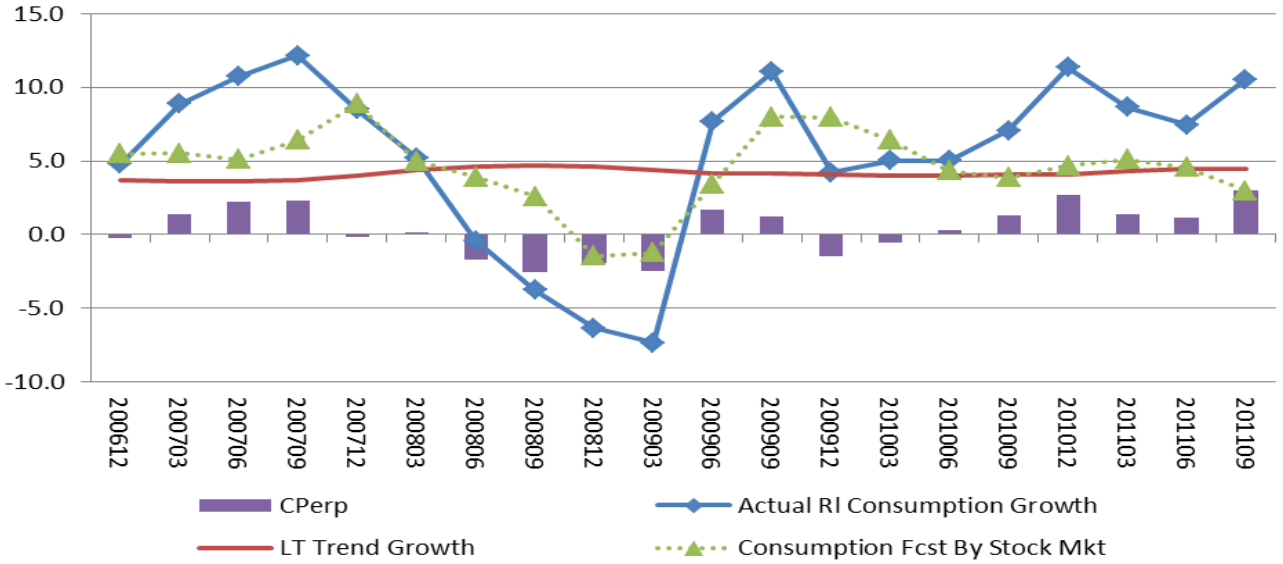
Korean Consumers Are Holding Back. Consumption Growth vs. Stock Market Forecast



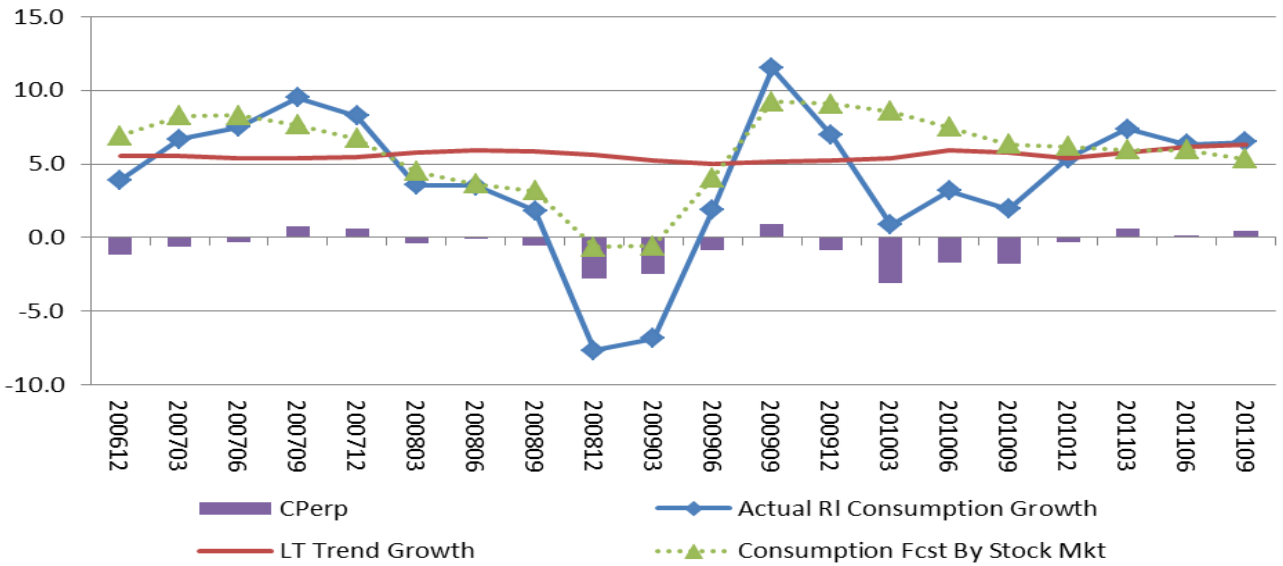
Mexico Real Consumption Growth Signal Positve Since Mid-2009



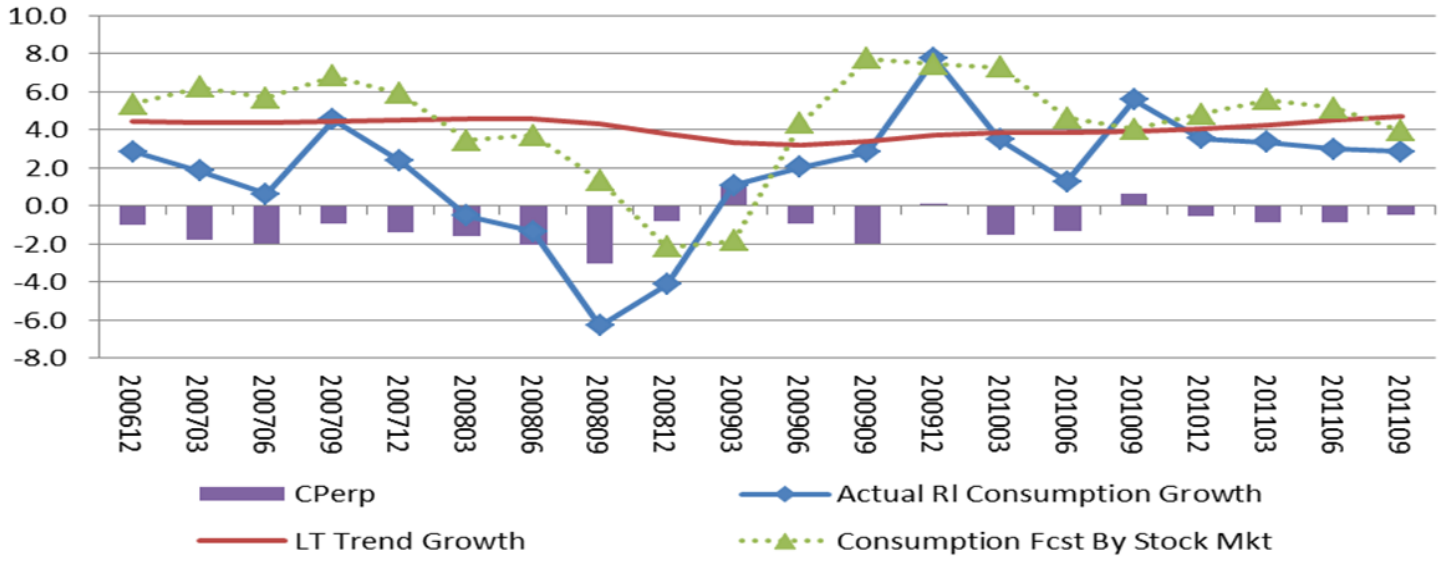
Hong Kong Consumer Spending Growth Very Strong in 2010-2011 vs. Stock Forecast



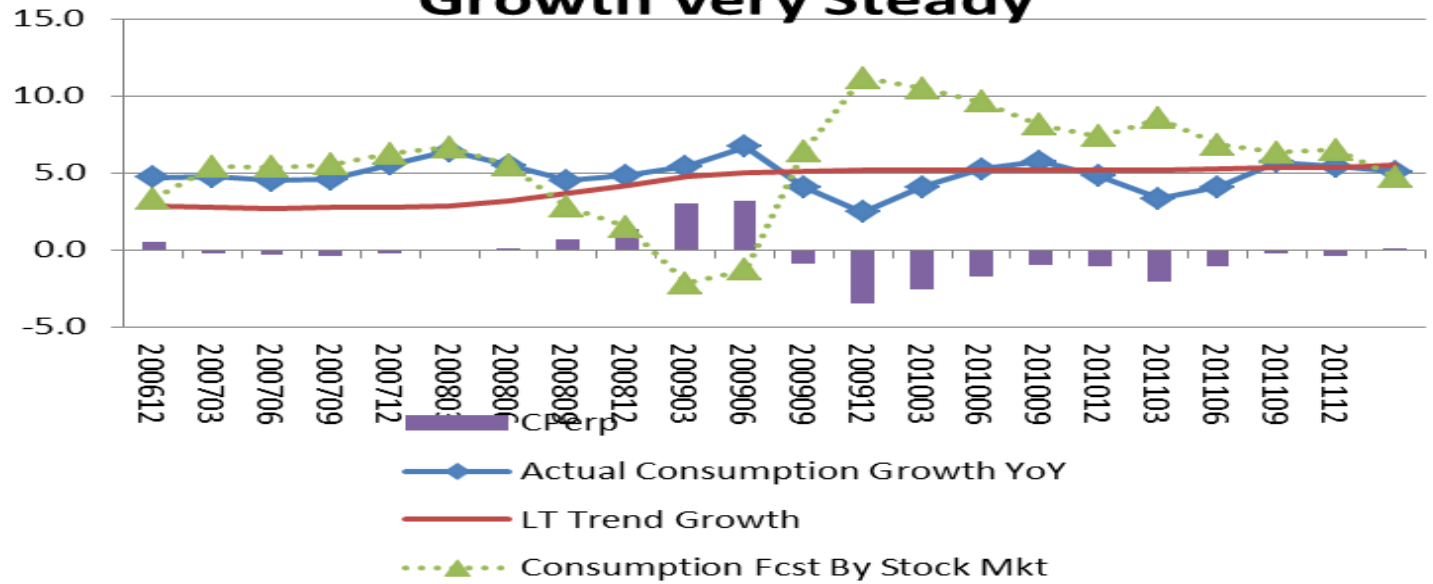
Singapore Consumer Spending Strengthened in 2011. Consumption Growth vs. Stock Forecast



Taiwan Consumers Hold Back. Consumption Growth vs. Stock Forecast



Indonesia Real Consumer Spending Growth Very Steady



Recent Behavior of the SBCLI

Q1: What readings did the SBCLI give during the last 5 years, including the "Financial Panic of 2008/9"?

Q2: What are the readings of the SBCLI at present?

Q3: What signals are consumers sending in various countries?

Stocks, Bonds, Consumers Leading Index Components and Totals

Douglas T. Breeden, Massachusetts Institute of Technology and Duke University

April 23, 2012

	Stock Market Signal		Stock Market Signal Updated		Consumers' Signal	Stocks + Consumers Leading Index		Bond Market Signal		SBCLI	SBCLI	
	Last 6 Months		Updated to 4/23/2012		Last 2 Quarters							Trend
	Real	Stocks	Return from:	Stocks	Real Consumption	Positive: Above trend growth		Slope	Slope			Growth
Country	Stock		3/16/2012	12	Deviation (Cperp)	Negative: Below trend growth						Real GDP
	Return	2*Z-Score	to	2*Z-Score	Z-Score	2xStocks Z-Score + Cperp		Z-Score	Z-Score	Total	Total	
	3/16/2012	3/16/2012	4/23/2012	4/23/2012		3/16/2012	4/23/2012	3/16/2012	4/23/2012	3/16/2012	4/23/2012	
United States	15.2	2.4	-2.8	1.9	0.2	**2.6**	**2.1**	0.5	0.2	**3.1**	**2.3**	2.6
Canada	-2.1	-0.6	-2.8	-1.1	0.7	**0.1**	**-0.4**	0.5	0.2	**0.6**	**-0.2**	2.6
Mexico	7.1	0.6	1.9	0.9	1.1	**1.7**	**2.0**					2.3
United Kingdom	10.6	1.4	-4.9	0.6	-0.6	**0.8**	**0.0**	0.1	-0.3	**0.9**	**-0.3**	2.3
Germany	23.7	3.2	-8.4	1.8	0.9	**4.1**	**2.7**	0.1	-0.1	**4.2**	**2.6**	1.3
France	10.4	1.2	-13.3	-1.0	0.0	**1.2**	**-1.0**					1.6
Italy	9.8	1.0	-17.8	-2.0	-1.5	**-0.5**	**-3.5**					0.9
Spain	-2.2	-0.6	-19.2	-3.8	-1.3	**-1.9**	**-5.1**					2.3
Japan	13.1	1.6	-5.8	0.6	1.8	**3.4**	**2.4**	-0.1	-0.1	**3.3**	**2.3**	0.7
Australia	-0.5	-0.4	1.8	-0.1	0.4	**0.0**	**0.3**					3.3
South Korea	8.2	0.6	-3.0	0.1	-1.0	**-0.4**	**-0.9**					4.1
Hong Kong	3.8	0.2	-3.3	-0.4	1.5	**1.7**	**1.2**					
Singapore	4.4	0.2	-0.6	0.1	0.5	**0.7**	**0.6**					
Taiwan	4.9	0.2	-7.6	-1.1	-0.4	**-0.2**	**-1.5**					
Brazil	19.8	1.6	-7.7	0.3	-0.1	**1.5**	**0.2**					3.8
Russia	3.1	0.0	-7.7	-1.3	1.5	**1.5**	**0.2**					4.8
India	6.0	0.4	-1.7	0.1	0.3	**0.7**	**0.4**					7.8
China	-6.3	-0.8	-0.7	-0.9	1.4	**0.6**	**0.5**					10.6
Indonesia	5.2	0.2	3.5	0.8	0.1	**0.3**	**0.9**					5.5

Conclusions

- Consumption spending, orthogonalized for stock market effects, “C-perp,” adds to the ability of real stock market returns and the term structure slope to forecast growth of real GDP, industrial production, employment growth and unemployment rate changes.

- The simple SBCLI index, reflecting information from stock and bond investors and consumers, is intuitive and has explanatory and forecast performance that is similar to that of more complex indexes of leading economic indicators.