The Economy; Monetary Policy Developments; Structure of the Fed and FOMC Meetings

Kalamazoo College
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Spencer Krane
Senior Vice President, Economic Research

The views expressed are my own and not those of the Federal Reserve
Bank of Chicago or the Federal Reserve System
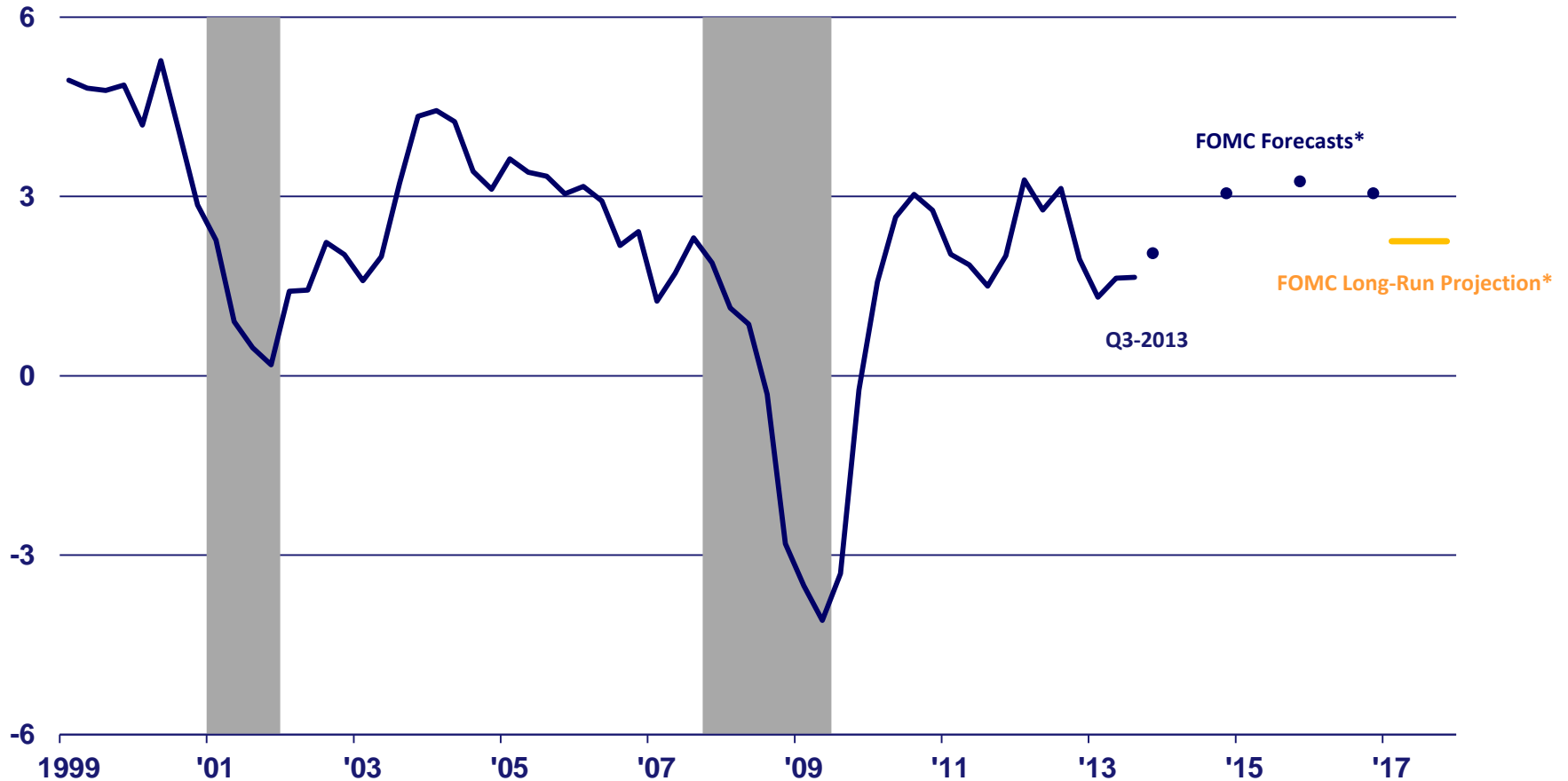
Outline

- **Overview of the Economy**
  - GDP, unemployment, inflation
  - FOMC Forecasts

- **Monetary Policy**
  - Principles
  - Nontraditional Policies

- **The institutional structure of the Fed**
  - Who are these people
  - What goes on at an FOMC meeting

Overview of the Economy
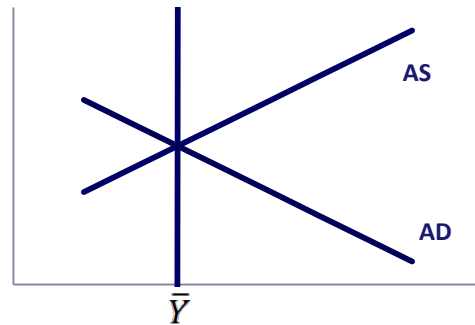
GDP Growth

Real GDP Growth
(yr/yr percent change)

FOMC Forecasts*

Q3-2013

FOMC Long-Run Projection*

*"Median" of Q4-toQ4 forecasts made by the FOMC participants, September 2013

What is the Benchmark? Potential Output

- **Potential output = natural level of output = full employment level of output**

$$\overline{Y} = \overline{A}\,\overline{K}^{\alpha}\,\overline{L}^{1-\alpha}$$

- **Y = GDP   K = Capital   L = Labor;**

  A = multi-factor productivity = total factor productivity

  (mfp or tfp)

- **"—" = full employment level**

Estimating Potential Output

- **Growth Accounting: Estimate "━" from data on K, L, and factor income shares for α**

  - e.g.

  $$L = Labor\ Force - Unemployed$$

  $$\overline{L} = Pop\ \overline{LFP}\left(1 - u^n\right)$$

  LPF = labor force participation rate; u^n = natural rate of unemployment

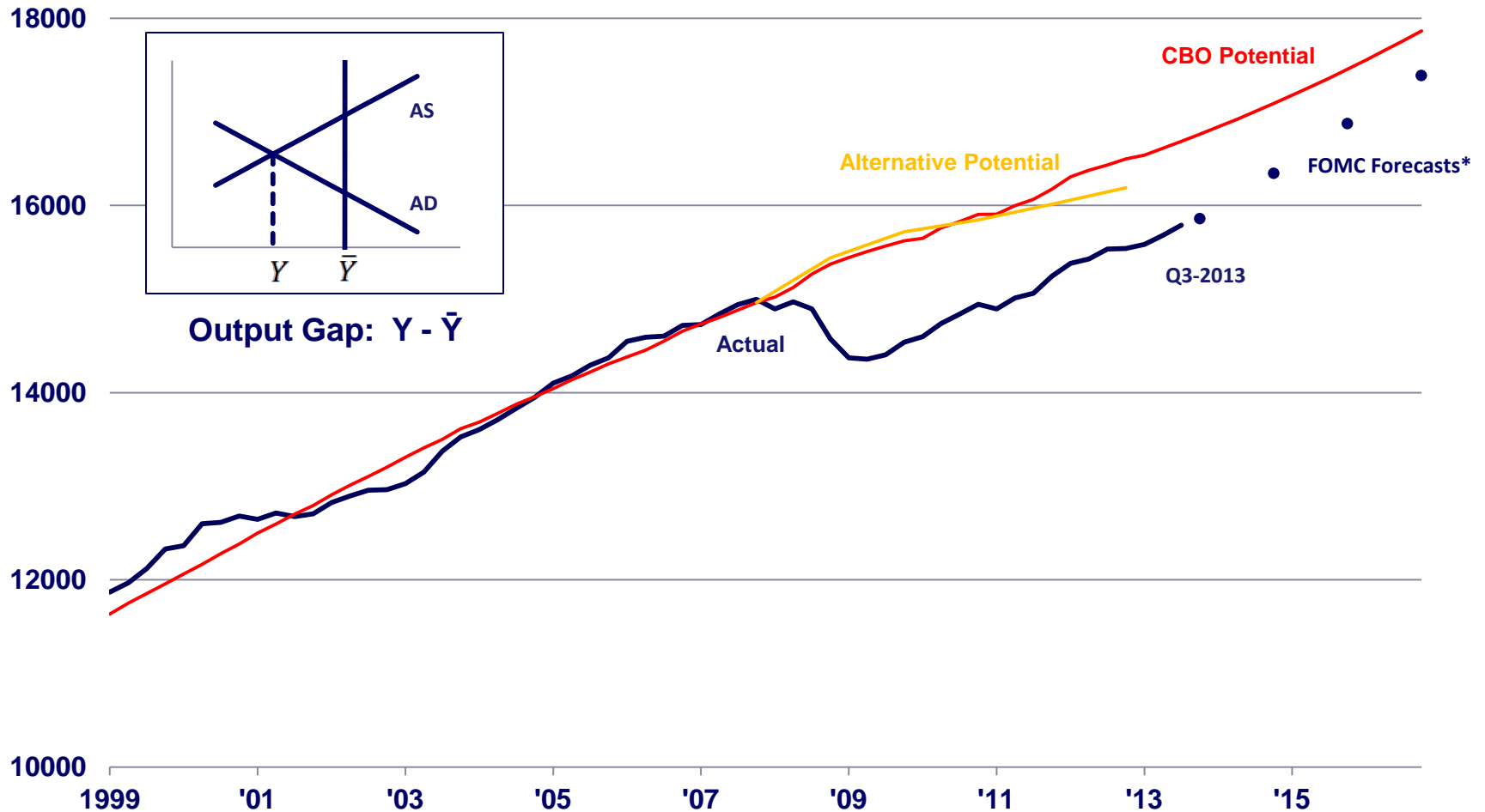- **Okun's Law:** $$\Delta u = -0.5\left(\Delta Y - \Delta \overline{Y}\right)$$

- **Phillips Curve:** $$\pi = E\pi - \beta\left(u - u^n\right) + v$$

  $$\pi = E\pi + \frac{1}{\alpha}\left(Y - \overline{Y}\right) + v$$

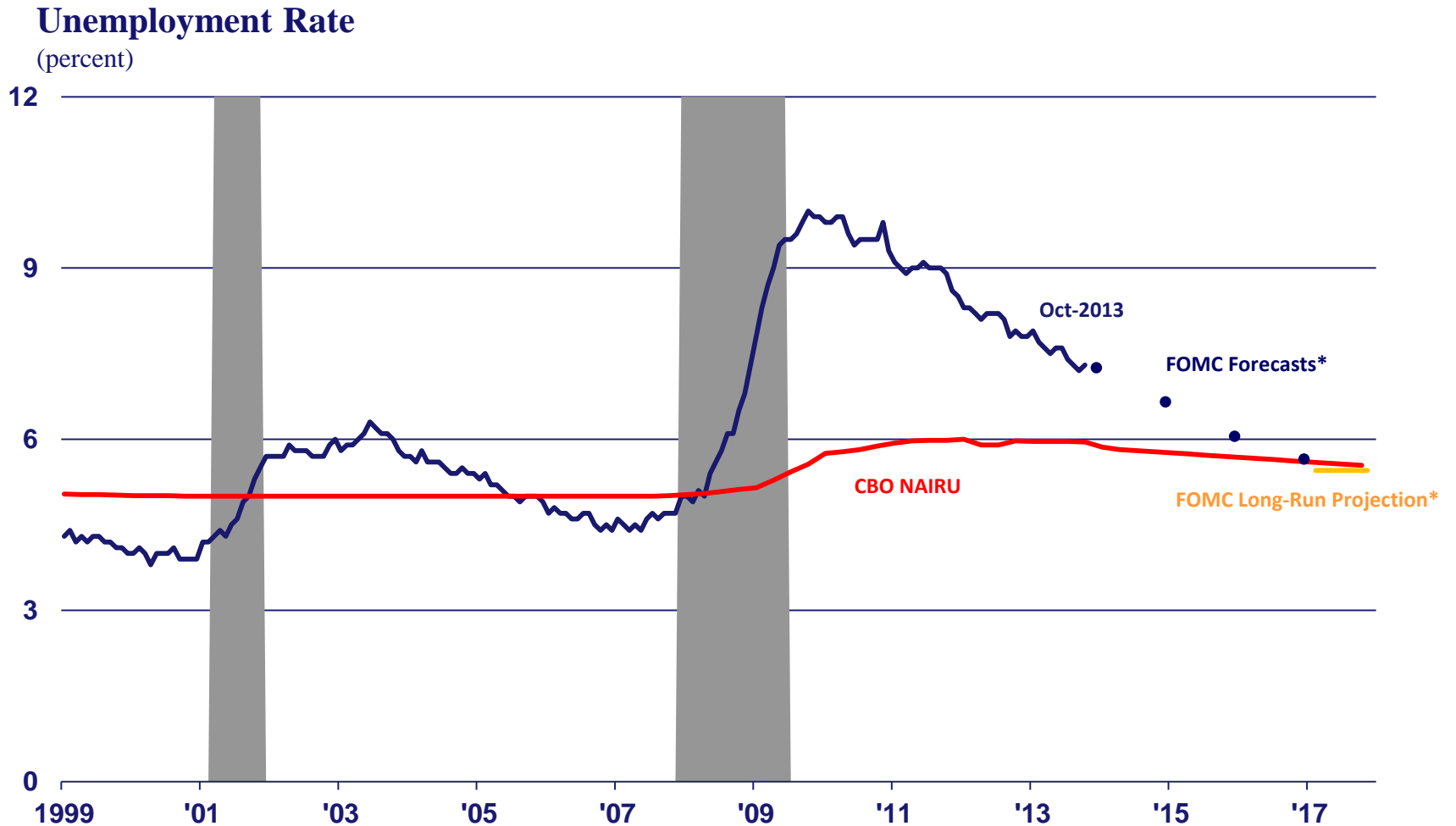# Actual and Potential GDP Level

Actual and Potential GDP
(Bils. 2009$)

*"Median" of Q4-toQ4 forecasts made by the FOMC participants, September 2013
CBO potential derived from CBO estimates, February 2013. Alternative potential derived from
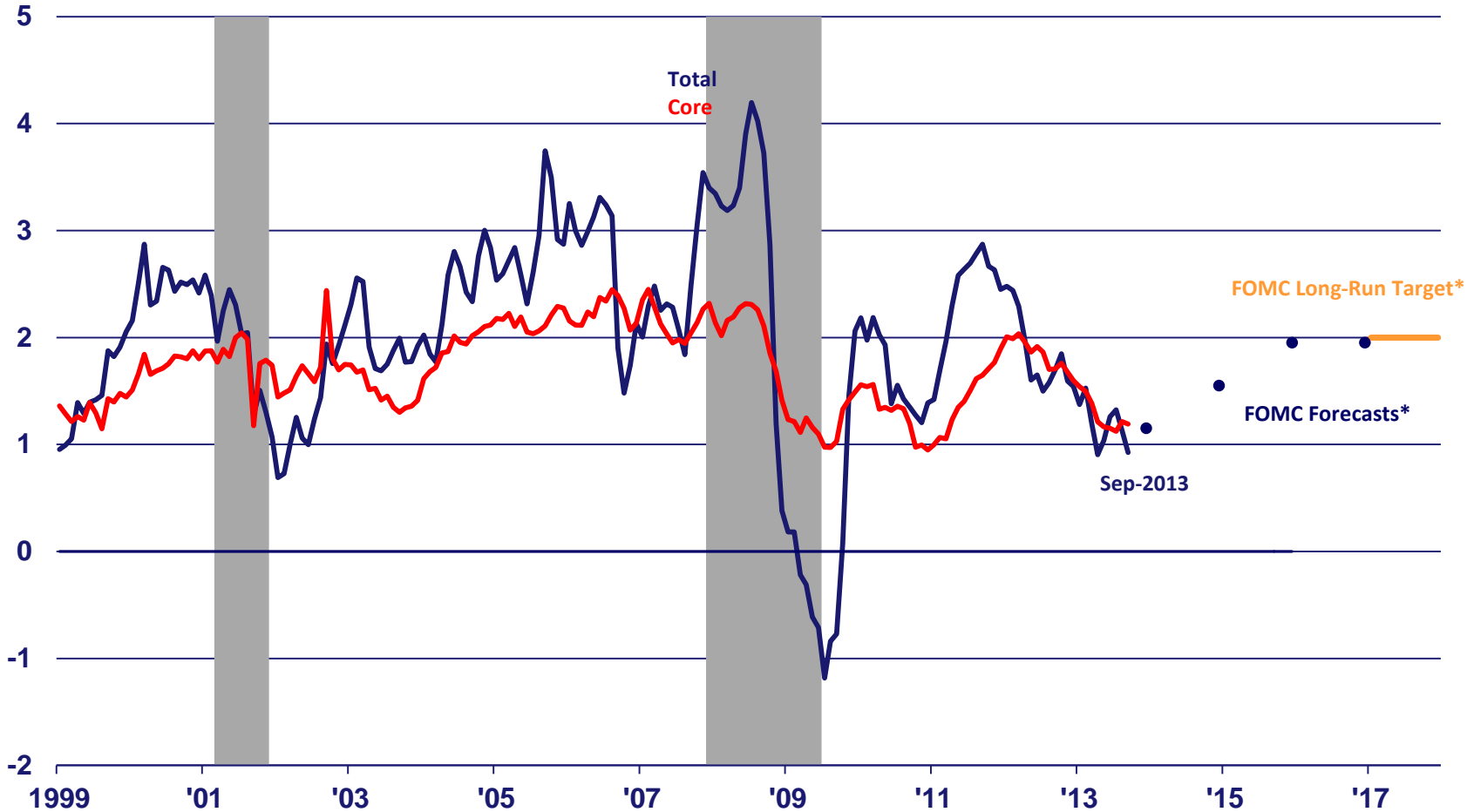Reifschneider, Wascher, and Wilcox (2013).*

Unemployment Rate

Unemployment Rate
(percent)

"Median" of Q4-toQ4 forecasts made by the FOMC participants, September 2013

Inflation

PCE Price Index
(12-month percent change)

How Did We Get In This Situation?

- **Housing market boom and bust**
  - Period of rapidly rising home prices, loose lending, and booming construction
  - Unwind was big drag on economy

- **Financial market disruption**
  - Surprising financial market fragility
  - Banks and "shadow banks" both highly stressed
  - Reduced credit availability slowed economy

- **Business and consumer pessimism**
  - Many disturbing events
  - Businesses and consumers become cautious; reduce spending

- **As a result we got a very bad recession in 2008-2009 followed by a very slow recovery**

Why Has the Recovery Been so Disappointing?

- **Long-lasting damage from the recession**
  - Difficult balance sheet restructuring by households, nonfinancial businesses and financial institutions
  - Scars from long-term unemployment, low capital formation

- **Additional shocks**
  - European crisis
  - Fiscal issues in U.S.

- **Continued business and consumer pessimism and uncertainty**
  - Precautionary behavior

- **Monetary policy runs into the zero lower bound (ZLB)**

Why Is Growth Expected to Pick Up?

- **Cyclical dynamics run their course**
    - Balance sheets improve
        - Bank capital
        - Business debt
        - Household net worth (house and equity prices up)
    - Pent up demand (foregone consumption and investment)

- **Fiscal restraint should be less**

- **Rest of world appearing to do better**

- **Continued accommodative monetary policy**

- **Set the stage for virtuous cyclical dynamics**

Monetary Policy

The Federal Reserve's Dual Mandate

- **Federal Reserve Act: Section 2a. Monetary Policy Objectives**

- **… the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.**

- **Goal is to help the economy achieve**
  - **Maximum employment: $u = u^n \Leftrightarrow Y = \bar{Y}$**
  - **Price stability: $\pi = 2$**

January 2012 Principles Statement: Long Run Goals and Policy Strategy

- **Price stability**
  - Sets 2% objective for PCE inflation
  - Target is for an average over medium term – it is not a ceiling
  - Explicit statement should help anchor expectations

- **Full employment**
  - Employment goal may change over time for non-monetary reasons
  - 5.2-6.0% unemployment currently consistent with mandate
  - Seek an economy operating at its level of potential output

- **Balanced approach**
  - Balanced reaction when shocks move economy from objectives
  - Takes account of lags and other limits in effects of monetary policy

Monetary Policy Goals: Output

- **We would like to see fully utilized productive resources**
  - Help close gaps between actual and "potential" output

- **But if over-stimulate the economy eventually results in increasing inflation**

$$\pi = E\pi + \frac{1}{\alpha}\left(Y - \overline{Y}\right) + v$$

- **In the long run**
  - **Potential output is the best can do on a sustainable basis**
  - **In the long run, the Fed can't make the economy grow faster than its potential (classical dichotomy)**

Monetary Policy Goals: Price Stability

- **Price stability provides the environment necessary to meet all the other goals of monetary policy**

- **An environment of price stability makes planning easier**
  - Price stability improves the workings of the price system -- high and variable inflation jams the signals sent by relative prices
  - Price stability may also lower long-term interest rates by reducing uncertainty

- **Usually discussed in terms of cost of inflation being too high or too low**

Monetary Policy In Usual Times

- **Target the federal funds rate**

- **Changes in fed funds rate moves other short-term interest rates**

- **Changes in short-term interest rates influence**
  - **Long-term interest rates**
  - **Exchange rates and asset values**

- **These then affect saving and investment decisions, which in turn affect employment and output**

Aggregate Demand Decline and the ZLB

Assume π = 0

Normal Adjustment

Zero Lower Bound

Interest rate

Aggregate Supply

Old r

Old IS Curve

New r

New IS Curve

Y*

Output

Aggregate Supply

Old r

Output Gap

Zero Bound r = 0

Old IS Curve

Equilibrium Rate

New IS Curve

Y*

Output
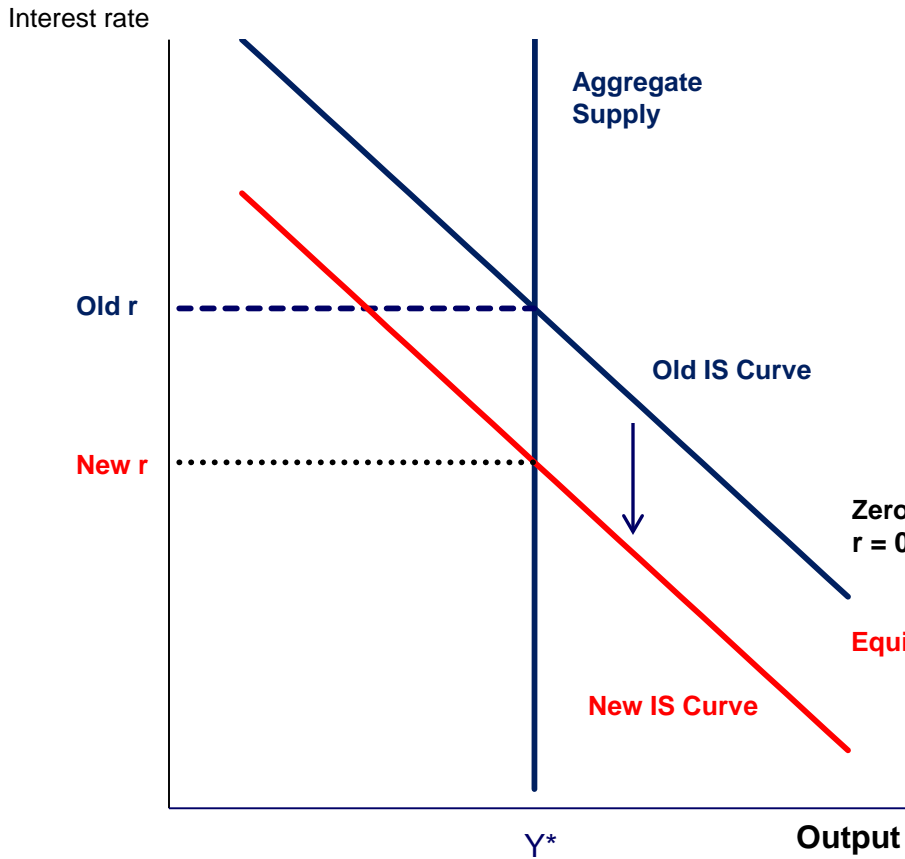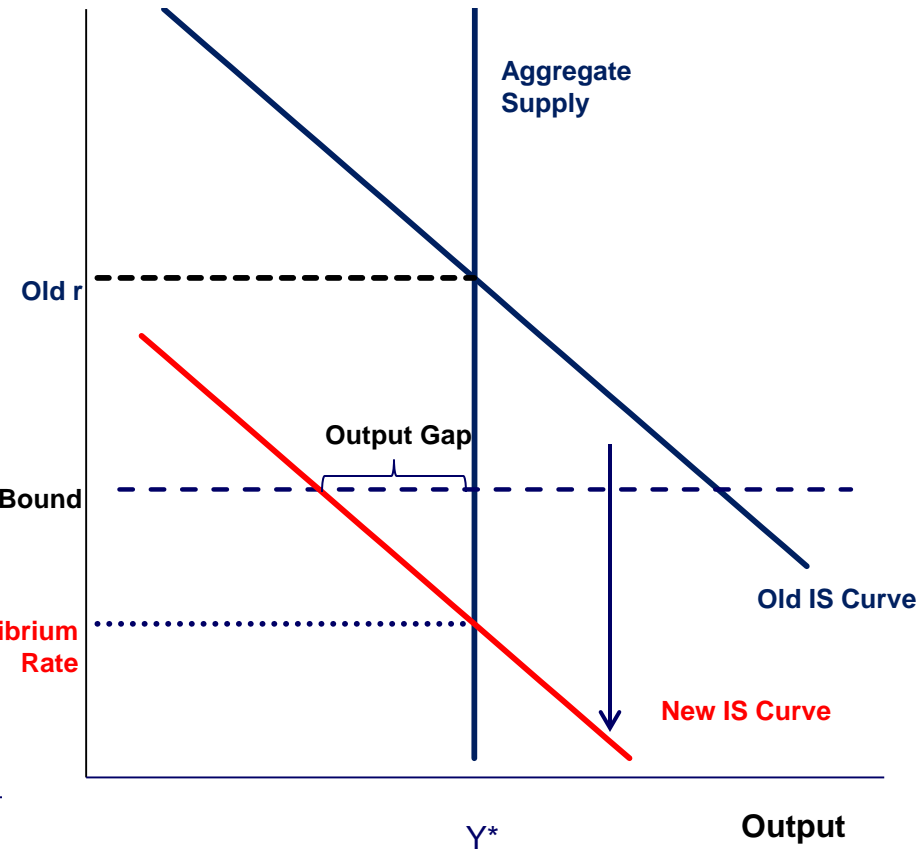
Aggregate Demand Decline and the ZLB

In real rates, r - π

Normal Adjustment

Zero Lower Bound

Real interest rate

Aggregate
Supply

Old r - π

Old IS Curve

New r - π

New IS Curve

Y*

Output

Aggregate
Supply

Old r - π

Output Gap

Zero Bound
r - π = - π

Old IS Curve

Equilibrium
Rate

New IS Curve

Y*

Output
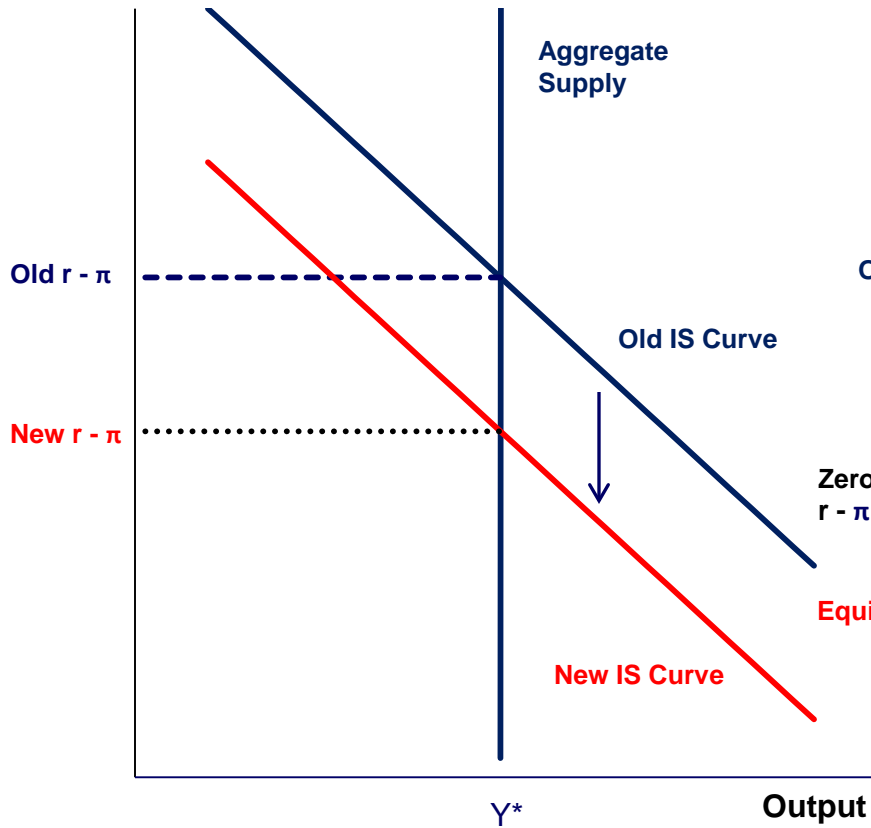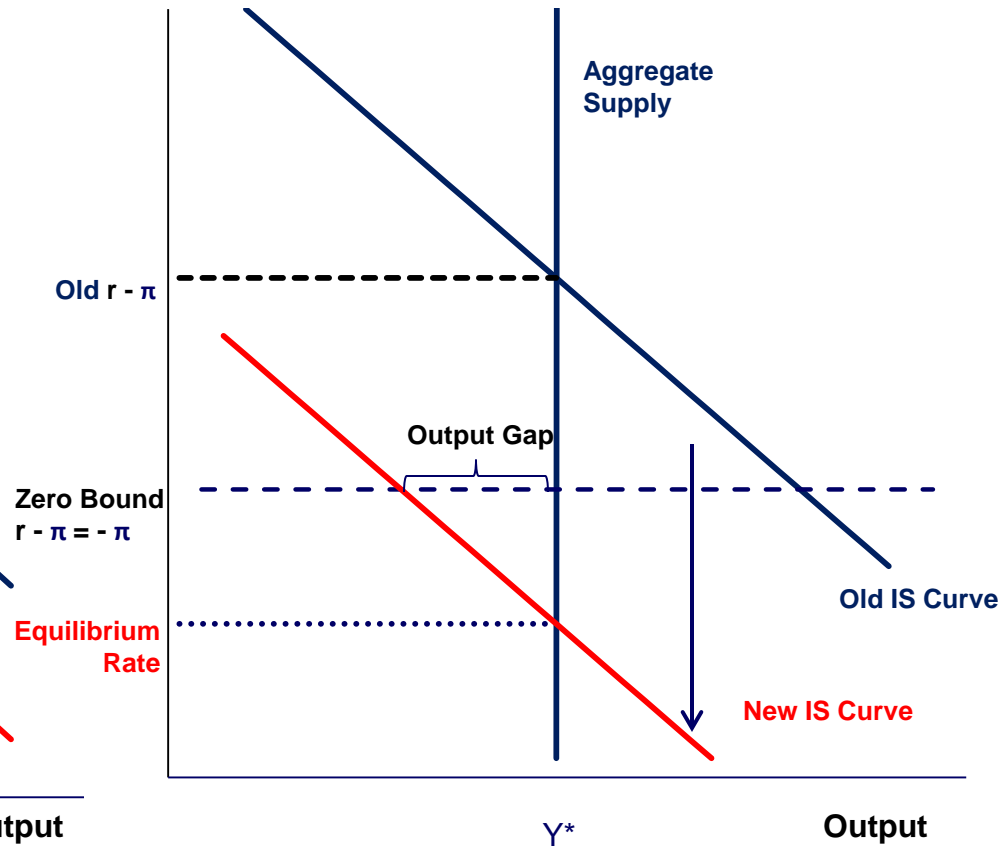
Simple Monetary Policy Rules

- **A description of how policy "usually" works**

- **Taylor's 1999 rule**

  - $r = 2 + \pi + 0.5(\pi - 2) + 1.0(Y - \bar{Y})$

- **Such simple rules are descriptive, but they are not "optimal policy"**

- **Numerous factors can cause deviation from simple rules**

- **Special factors affecting policy today**
  - **Financial crisis and its aftermath**
  - **The zero lower bound**

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Policy Rate Constrained By Zero Lower Bound

Fed Funds Rate
(percent)

Central Tendency of FOMC
Long-Run Projection

History
Market Expectations
Taylor Rule: $r_t = 2.0 + \pi_t + 0.5(\pi_t - 2) + 1.0\,(y_t - y_t^*)$
  CBO Gap
  Alt Gap
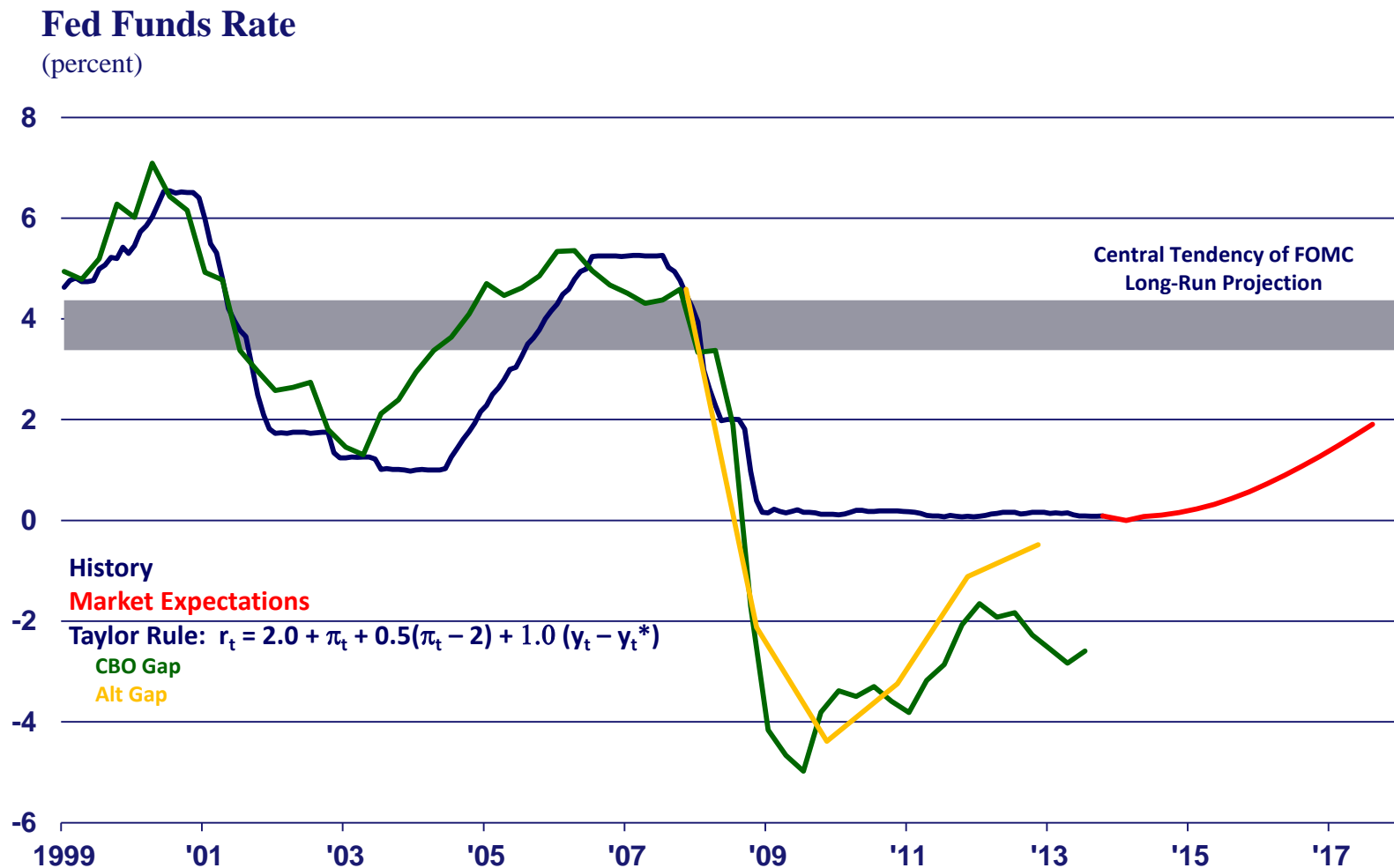
Taylor Rules use core inflation. Alternative gap based on alternative potential output shown above. CBO potential derived from CBO estimates, February 2013. Alternative potential derived from Reifschneider, Wascher, and Wilcox (2013).

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Monetary Policy At The Zero Lower Bound

- **What to do when can't cut <u>current</u> short-term rate any further?**

- **Lower medium and longer-term interest rates**
  - **Most spending decisions rely on medium and longer-term interest rates**
    - **Auto loans**
    - **Mortgages**
    - **Bond-financed business expenditures**
  - **Exchange rates and asset prices are influenced by medium and longer-term interest rates**

Monetary Policy At The Zero Lower Bound

- **Longer-term interest rates roughly equal expected average future short-term rates plus a term premia (tp)**

$$r_t^{10} \approx \frac{1}{10} E_t \left[r_t^1 + r_{t+1}^1 + r_{t+2}^1 ... + r_{t+10}^1 \right] + tp_t^{10}$$

  - tp reflects risk of holding a long-term bond relative to rolling over a series of short-term bonds

- **Option 1: Lower expectations of average <u>future</u> short-term rates through "forward guidance" on future policy rates**

- **Option 2: Buy long-term bonds to**

    - **Reduce term premium**

    - **Reinforce option 1**

Option 1: Forward Guidance on Funds Rate

- **Economic conditions likely to warrant exceptionally low level of the funds rate:**

  - **December 2008: "for some time"**

  - **March 2009:   "for an extended period"**

  - **August 2011:   "at least through mid 2013"**

  - **January 2012:   "at least through late 2014"**

Forward Guidance on Funds Rate cont.

- **September 2012: "…the Committee expects that a highly accommodative stance of monetary policy will remain appropriate <u>for a considerable time after the economic recovery strengthens</u>….at least through mid-2015."**

  - **Make up for period of constraint by ZLB by committing to a lower rate path for rates in the future then you would "normally" do.**

Forward Guidance on Funds Rate cont.

- **December 2012:   "Economic conditions likely to warrant exceptionally low level of the funds rate at least as long as <u>the unemployment rate remains above 6-1/2 percent</u>, <u>inflation</u> between one and two years ahead is projected to be <u>no more than a half of a percentage point above </u>the Committee's <u>2 percent </u>long-run goal, and longer-term <u>inflation expectations </u>continue to be <u>well-anchored</u>."**

Policymaker's Optimization Problem

Loss Function in (π, y) : $\quad$ **L = (π - π*)^2 + λ(y – y*)^2**

Assume π* = 2% and λ = 0.25

Okun's Law (in levels): $\quad$ **(u – u^n) = 0.5 (y - y*)**

Loss Function in (π, u): $\quad$ **L = (π - 2)^2 + (u – u^n)^2**

Optimization Problem: $\quad$ $$min\ E_t \sum_{j=1}^{\infty} \beta^{j} L_{t+j}$$

π - **Actual inflation rate** $\qquad\qquad$ π* - **Inflation target**

y – Output $\qquad\qquad\qquad\qquad$ **y* - Potential output**

u - Unemployment rate $\qquad\qquad$ **u^n - NAIRU**

A Policy Loss Function

Loss Function
(percent)

$$L = (\pi - \pi^*)^2 + (u - u^n)^2$$
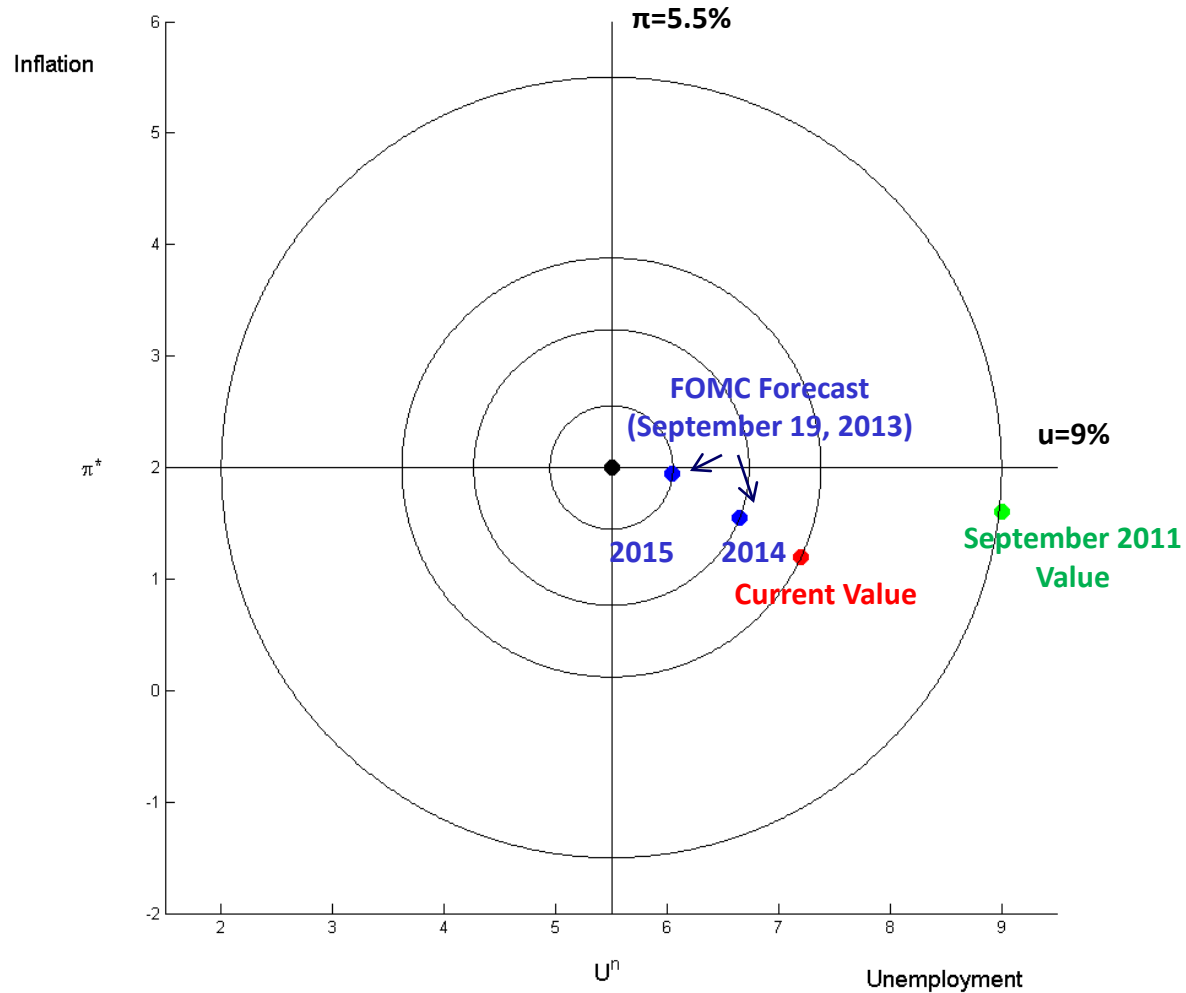
Source: Charles Evans, "A Mainstream Case for Monetary Accommodation," Boston, April 13, 2013

Some Optimal Control Monetary Policies

Figure 4
Optimal policies versus the inertial Taylor (1999) rule
(Baseline conditions)

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FOMC "Appropriate" Policy Rates

Taylor Rule:
$r_t = 2.0 + \pi_t + 0.5(\pi_t - 2) + 1.0\,(y_t - y_t^*)$

Mkt. Expectations (9/19)
2014 Q4: 0.30
2015 Q4: 0.91
2016 Q4: 1.76

2013   2014   2015   2016   Long-Run
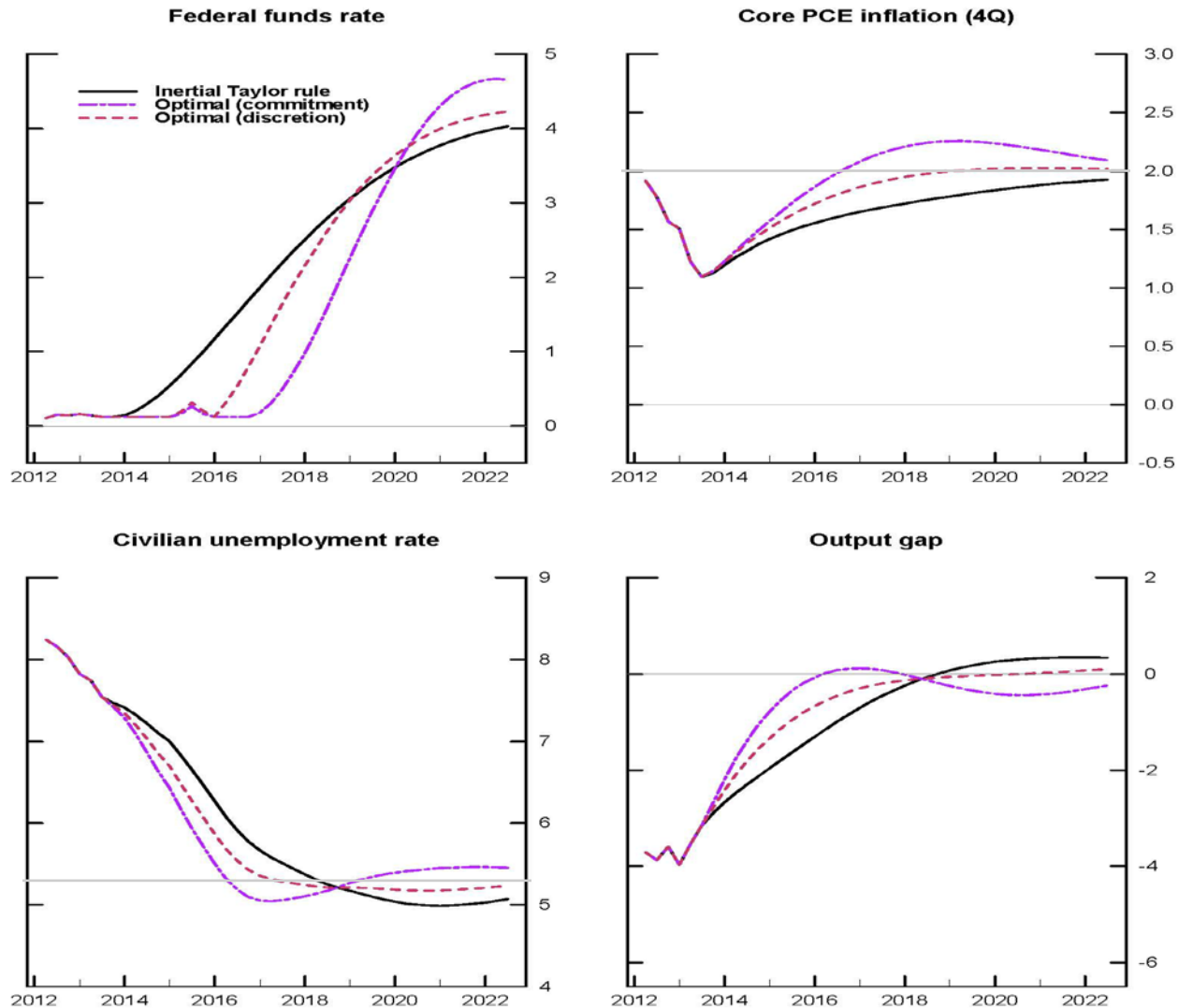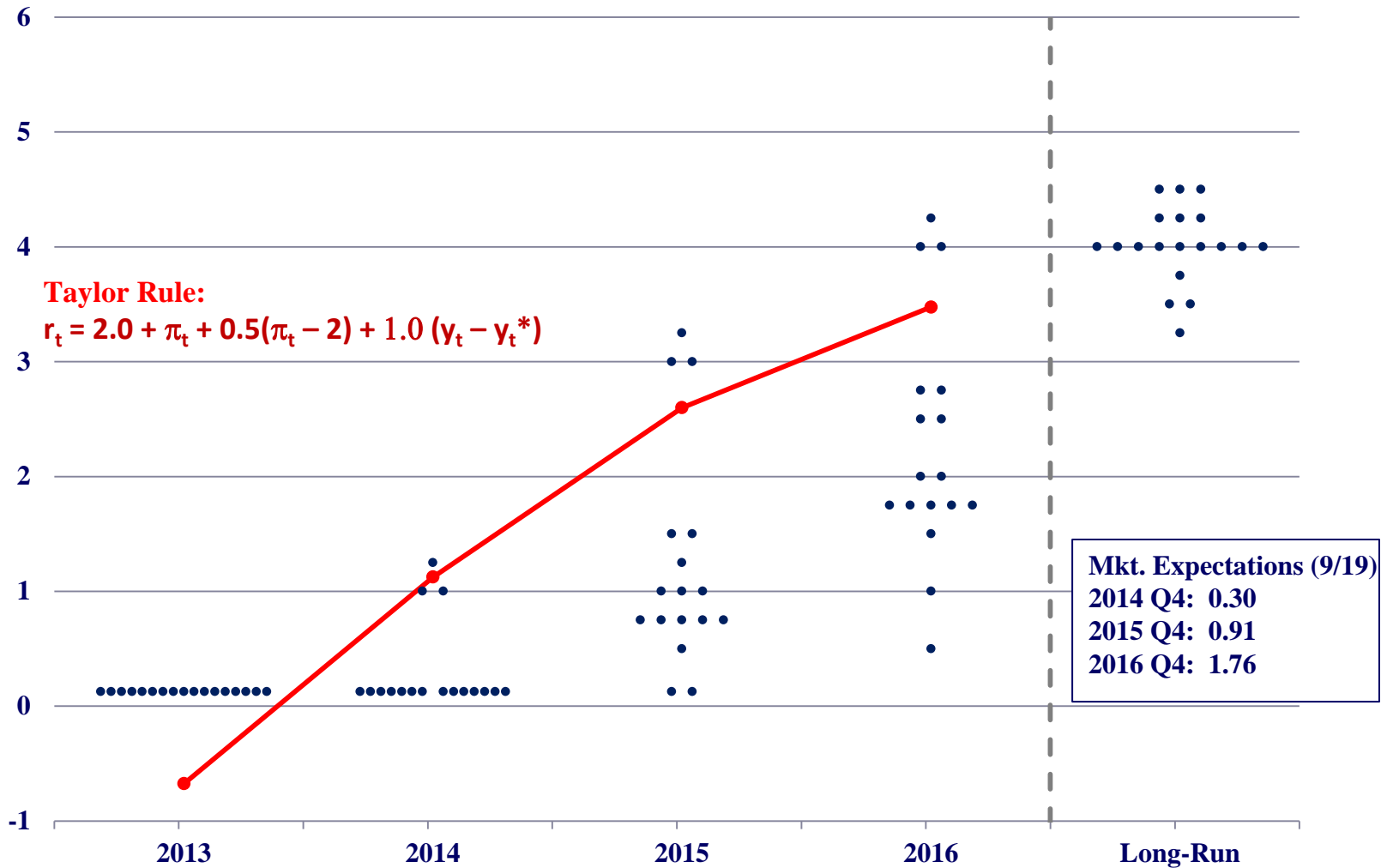
Source: Interest rate forecasts are from the September 18, 2013 FOMC Summary of Economic Projections; market expectations from OIS futures, September 19, 2013

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Option 2: Large Scale Asset Purchases (LSAP)

- **LSAP I (11/08): $600 bill agency debt/MBS**

- **LSAP Ia (3/09): $850 bill agency debt/MBS; $300 bill Treas.**

- **LSAP II (11/10): $600 bill Treas.**

- **MEP (9/11): Exchange $400 bill short-term for $400 bill long-term Treas.**

- **MEP extension (6/12): Extend MEP through end of 2012**

- **LSAP III (9/12): $40 bill per month MBS, no fixed end date -- "until labor market outlook improved substantially"**

- **LSAP IIIa (12/12): $40 bill per month MBS and $45 bill per month long-term Treas; no fixed end date**

Large-Scale Asset Purchases cont.

Federal Reserve Assets
(Bils. $)
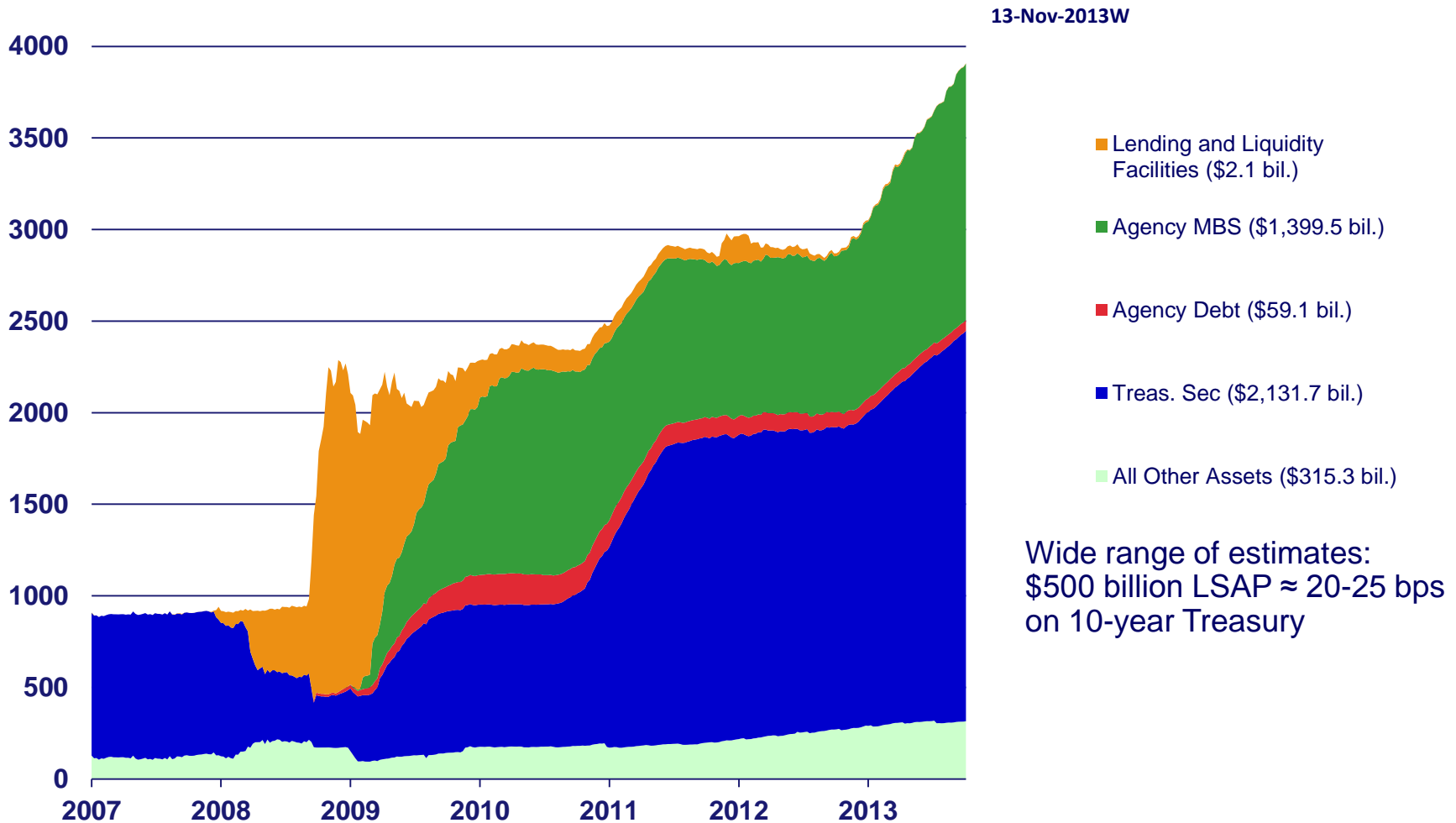
Long-Term Rates Down Significantly

10-Year Treasury
Conventional 30-Year Mortgages
48-Month New Car Loans
BBB Corporate Bonds

08-Nov-2013W

33
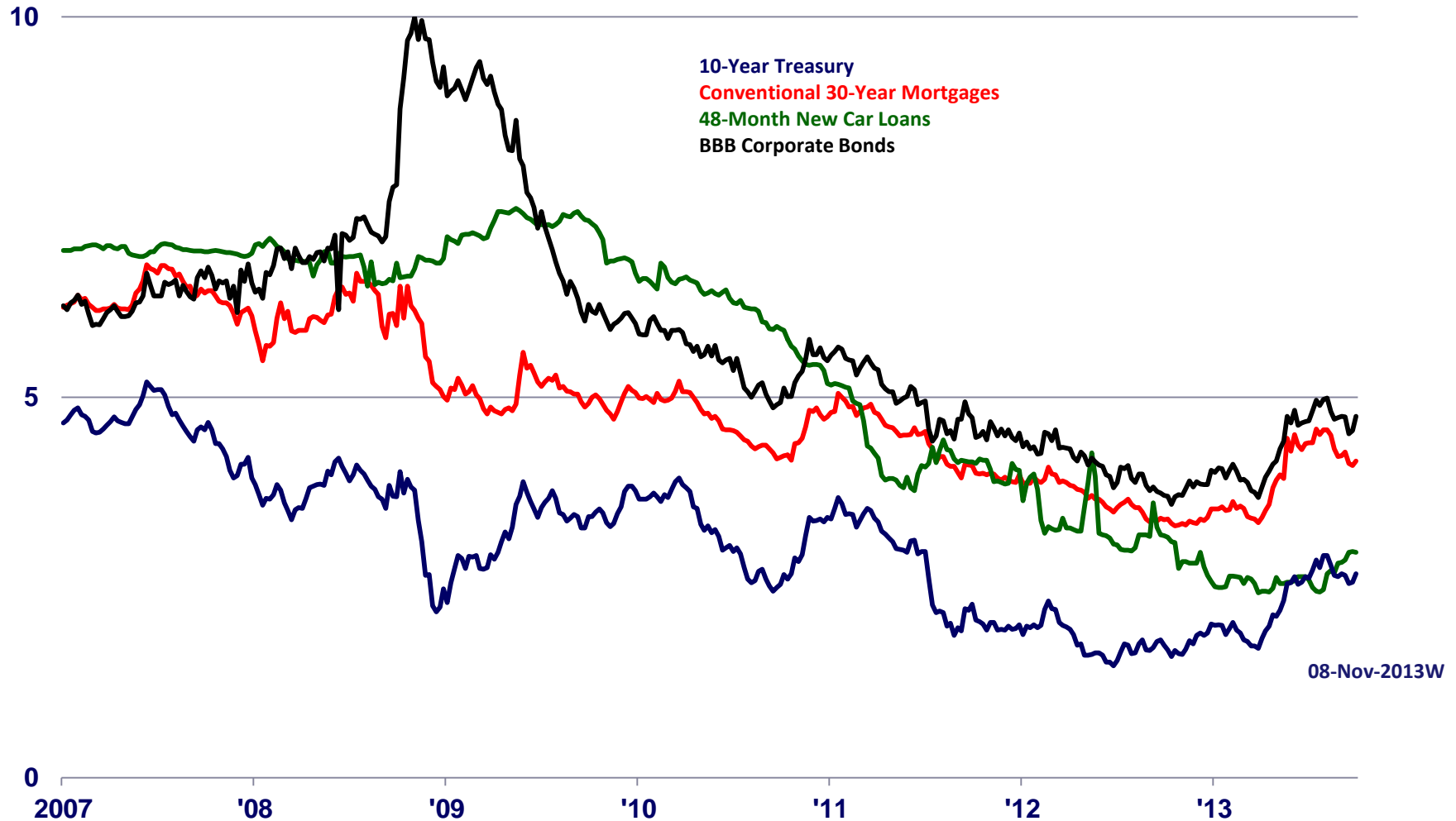
Empirical Facts about Term Premia

Chart 2. Decomposition of 10-Year Treasury Yield

Monthly — Percent

Legend:
- Expected average inflation rate
- Expected average real short rate
- Term premium
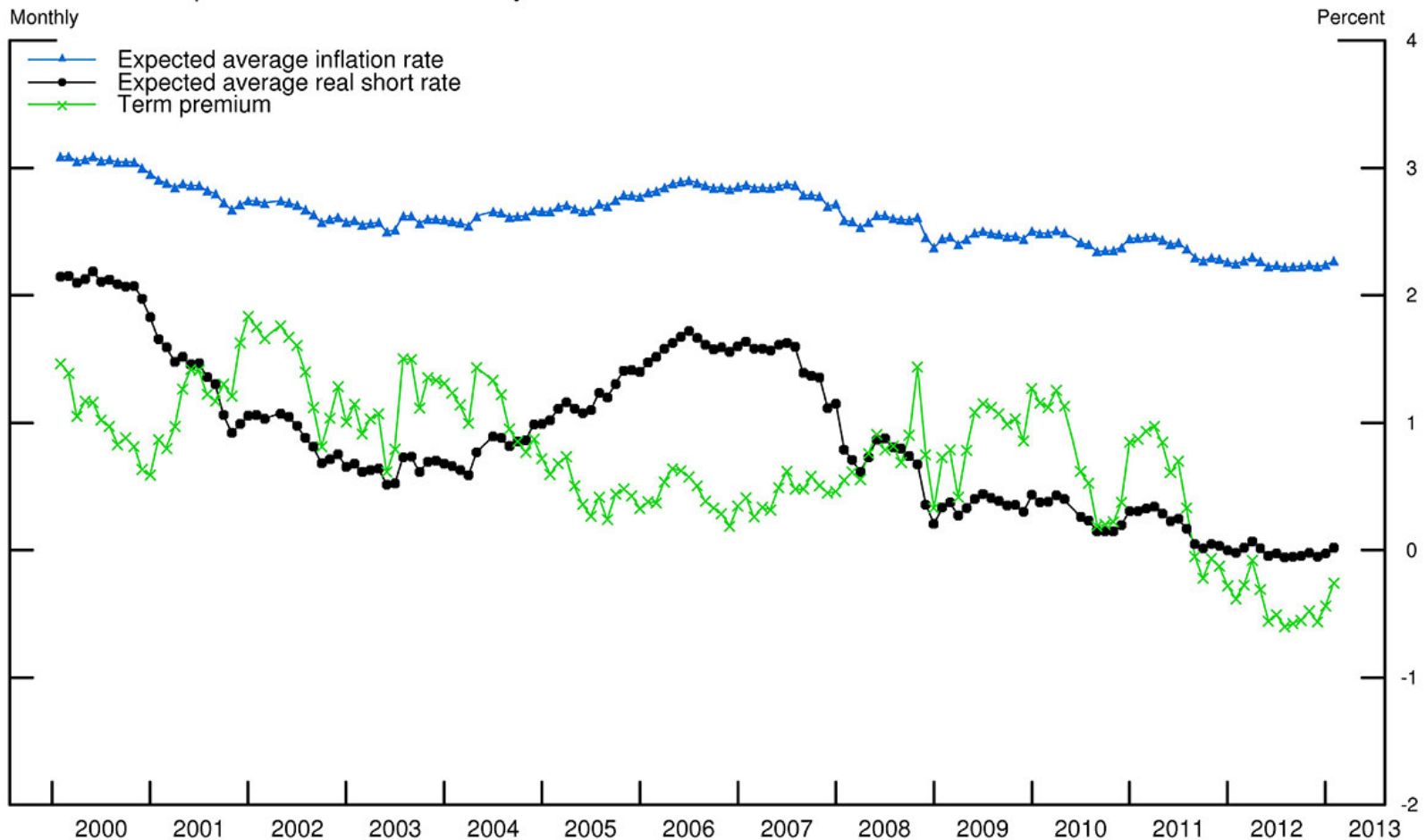
Note: Decomposition of 10-year zero-coupon Treasury yield based on the term structure model of D'Amico, Kim, and Wei (2010).
Source: Federal Reserve Board; Barclays PLC; staff calculations.

Source: Ben Bernanke, "Long-Term Interest Rates," San Francisco, March 1, 2013

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Structure of the Fed and FOMC Meetings

Federal Reserve Districts

Alaska and Hawaii are part of the San Francisco District
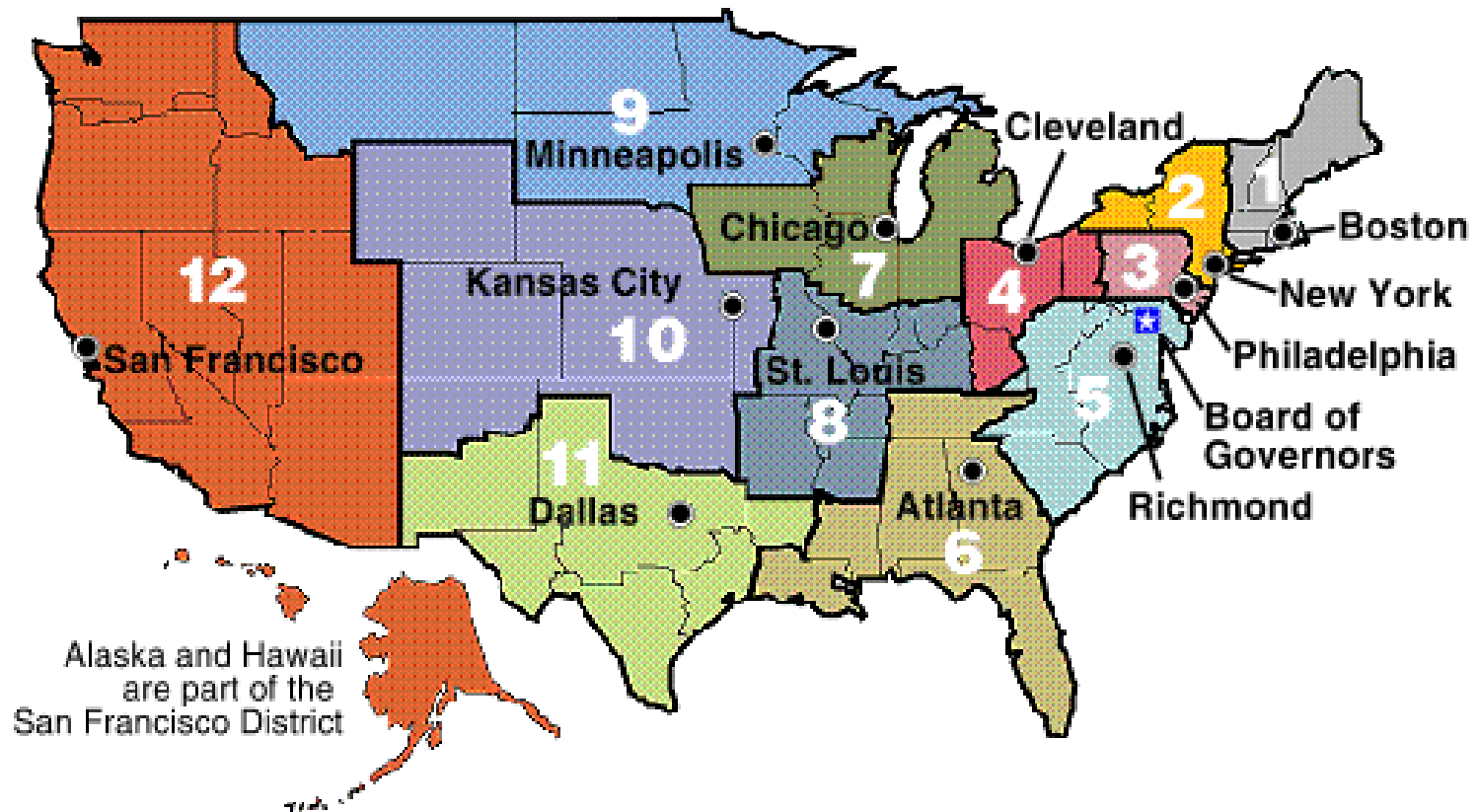
Nice Marble

Board of Governors

Chicago Fed

The Federal Reserve Board of Governors*
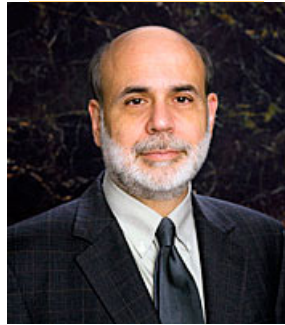
Ben S. Bernanke

Janet L. Yellen

Daniel K. Tarullo
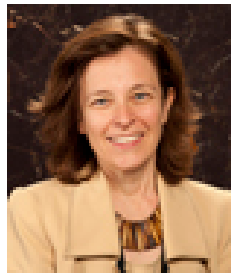
Sarah Bloom Raskin**

Jeremy C. Stein

Jerome H. Powell

*One seat currently vacant due to resignation of Elizatbeth Duke, effective August 30, 2013.

**Not voting pending Treasury confirmation.

Presidents of the District Reserve Banks

Eric S. Rosengren*

First District - Boston

William C. Dudley*

Second District - New York

Charles I. Plosser

Third District - Philadelphia

Sandra Pianalto

Fourth District - Cleveland

Jeffrey M. Lacker

Fifth District - Richmond

Dennis P. Lockhart

Sixth District - Atlanta

Charles L. Evans*

Seventh District - Chicago

James B. Bullard*

Eighth District - St. Louis

Naryana Kocherlakota

Ninth District - Minneapolis

Esther L. George*

Tenth District - Kansas City

Richard W. Fisher

Eleventh District - Dallas

John C. Williams

Twelfth District - San Francisco

What Happens Before the FOMC Meeting?

- **Board staff prepare and distribute to entire FOMC:**
  - Economic forecast (Tealbook Part A)
  - Monetary policy alternatives (Tealbook Part B)
  - Other analyses

- **Regional bank staffs prepare their bank presidents:**
  - Internal forecasts and analyses
  - Analyze Board staff documents
  - Help bank president prepare commentary on
    - Board staff materials
    - Personal economic outlook and policy views

What Happens at an FOMC Meeting?

- **Preliminaries**
  - Administrative matters
  - Often presentation on special topic

- **Report from the "Desk"**
  - NY Fed Markets Group: What's up in the markets

- **Tealbook Part A presentation**
  - The economic outlook

- **Financial stability report (quarterly)**

- **"First Go-Around": Participants present views on regional and national outlook**
  - Supposed to avoid talking about policy; people cheat a little

What Happens at an FOMC Meeting?

- **Tealbook Part B presentation: The policy options**

- **"Second Go-Around":   Policy discussion**
  - Participants give views of appropriate policy

- **The Vote: The Chairman gives his sense of the consensus**
  - "Word-smithing" the FOMC statement
  - Only (12) members vote

- **Post-decision activities**
  - Lunch
  - Sometimes presentation of a special topic
  - The Chairman's Press Conference (quarterly)

Appendix

Short-Run Monetary Non-Neutrality

- **Evidence from Christiano, Eichenbaum, and Evans (2005)**
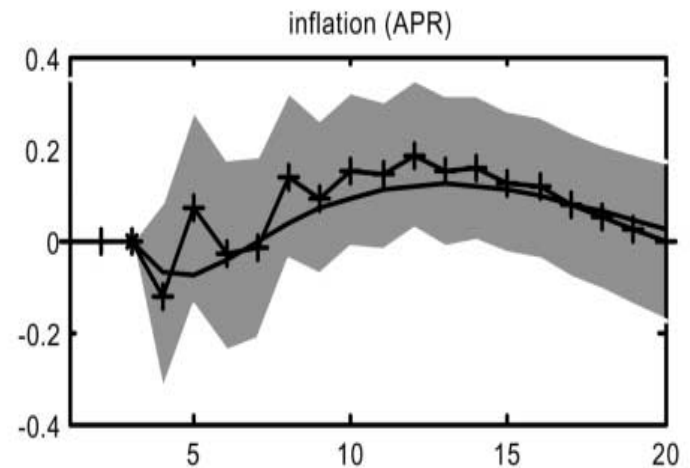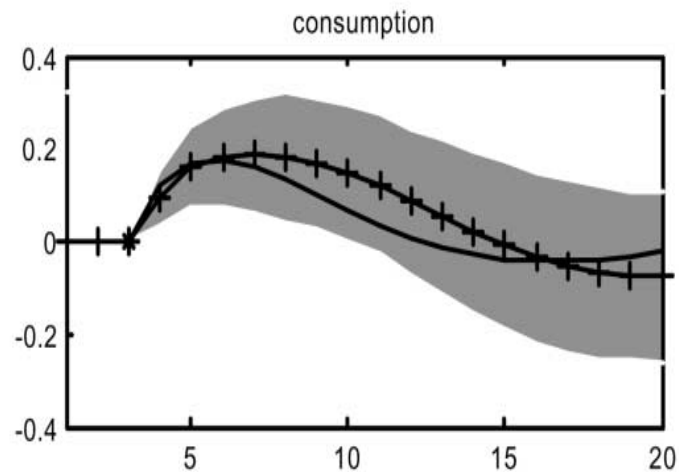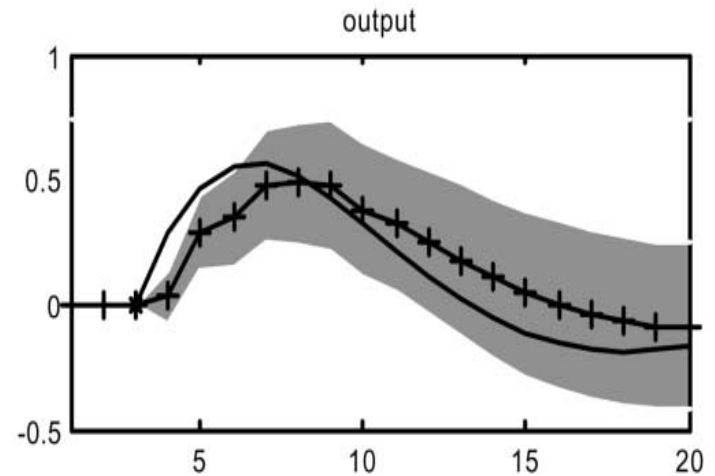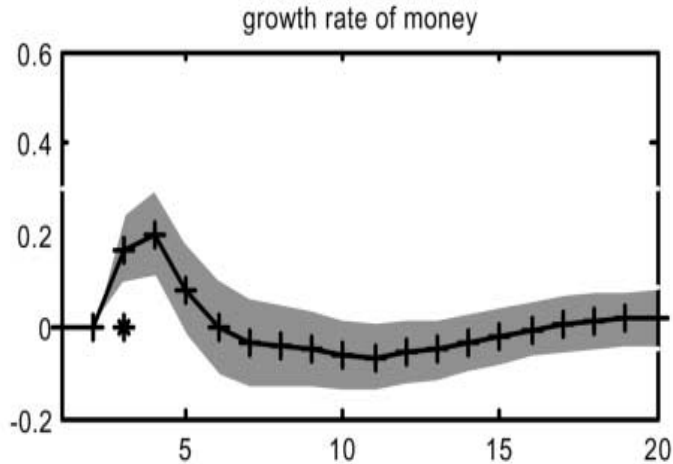
International Trade – Exchange Rates

Broad Trade-Weighted Dollar
(Index, Jan-97=100)
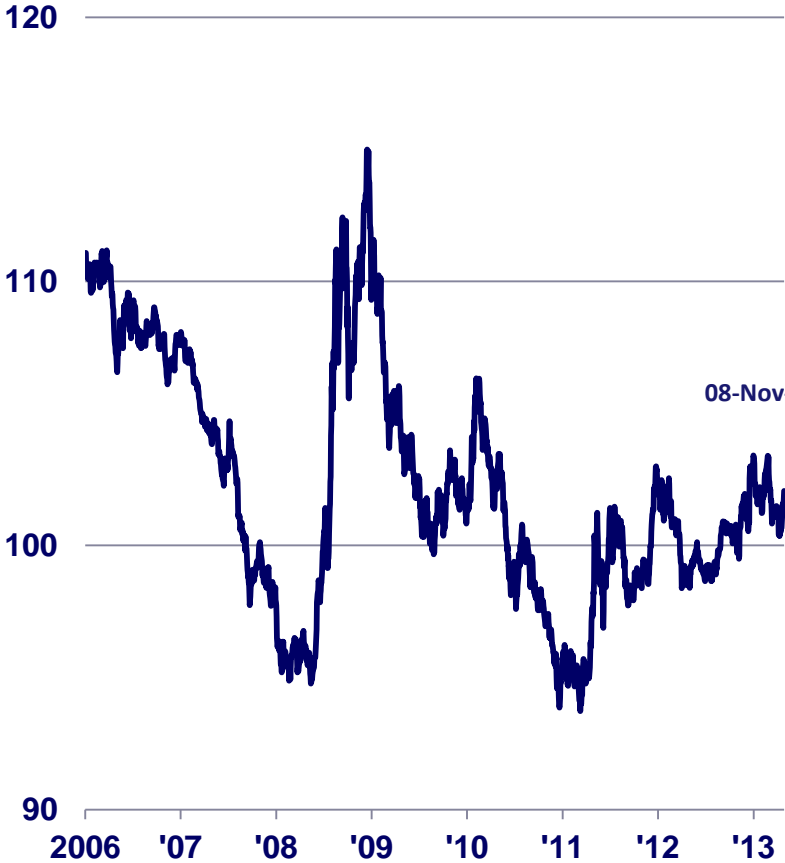
Major Foreign Currency Exchange Rates
(Exchange rates expressed as Foreign Currency/USD)

Inflation Expectations

TIPS Inflation Compensation
(percent)

University of Michigan Median Inflation
(percent)
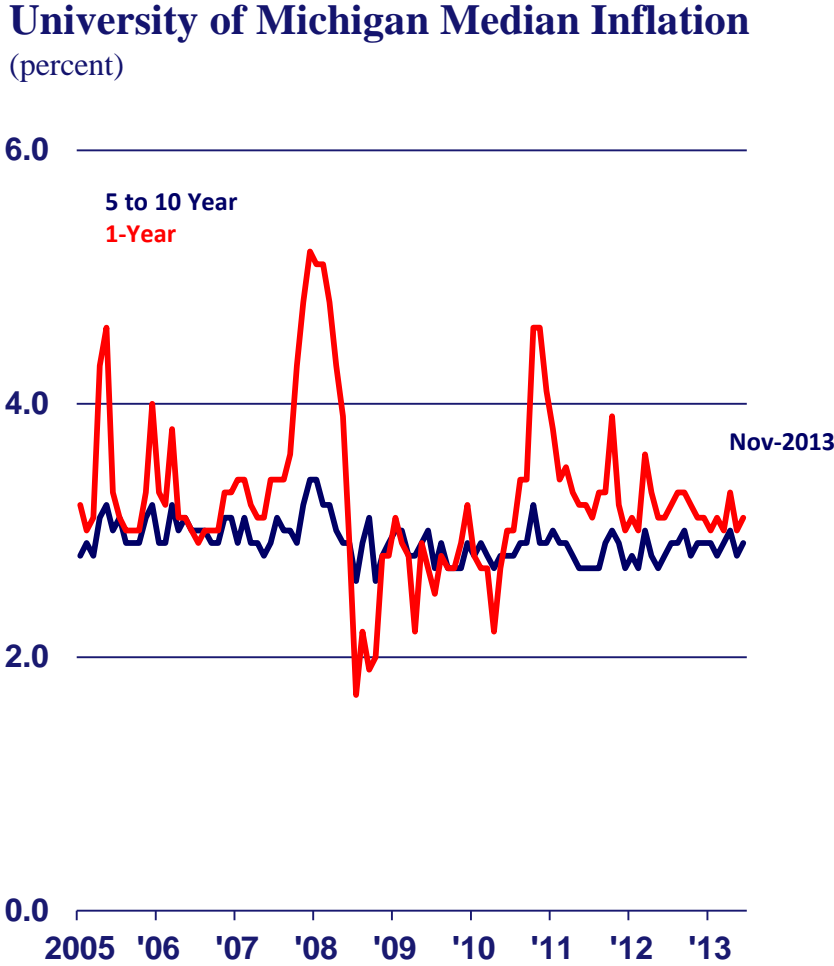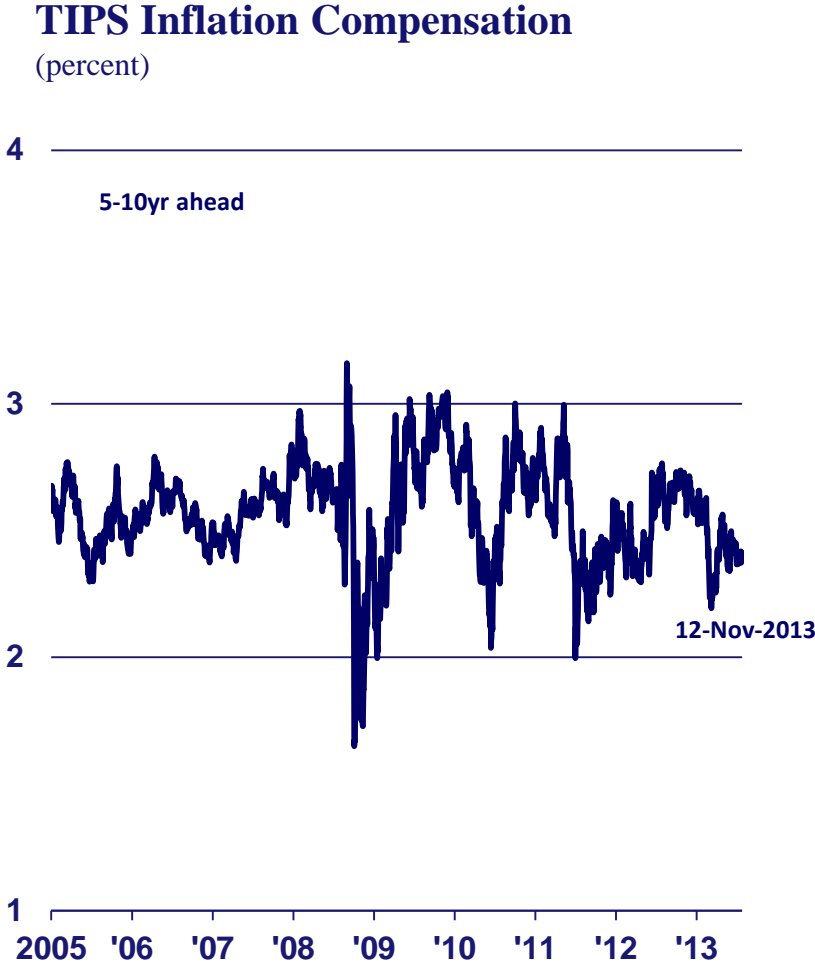
Labor Market

Private Nonfarm Payroll Employment
(change, thousands)
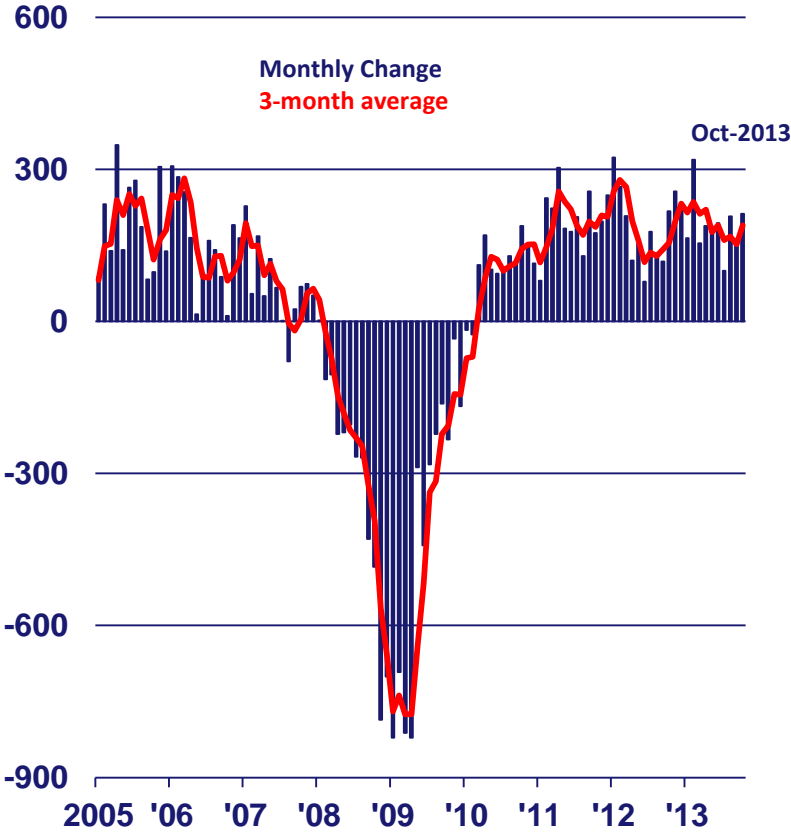
Unemployment and Participation Rates
(percent)
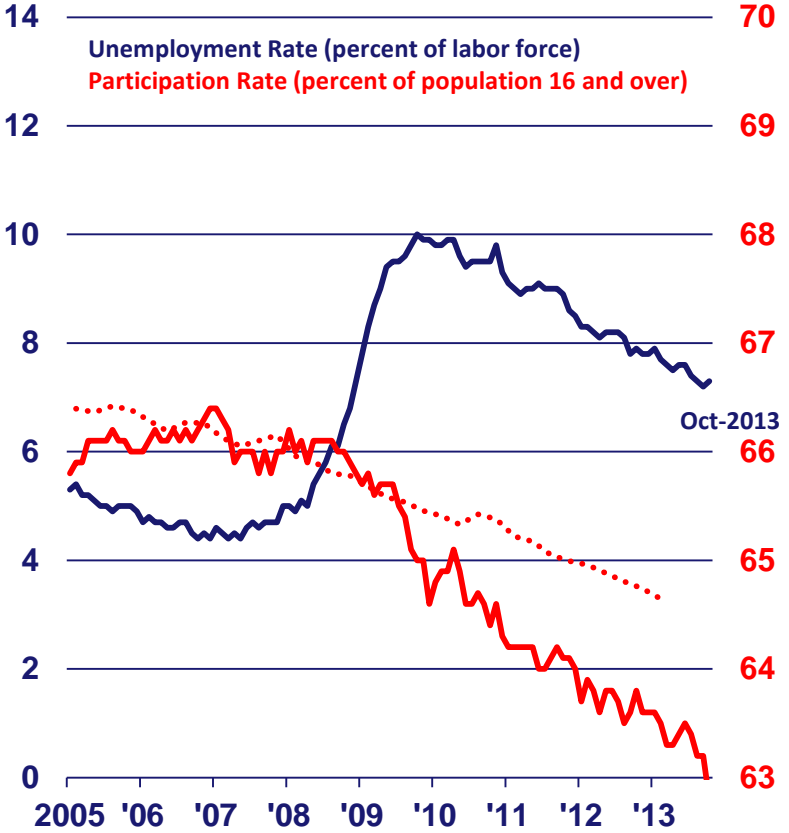
Consumer Spending Rising Moderately

Real Retail Sales excluding Autos
(percent increase, annual rate)
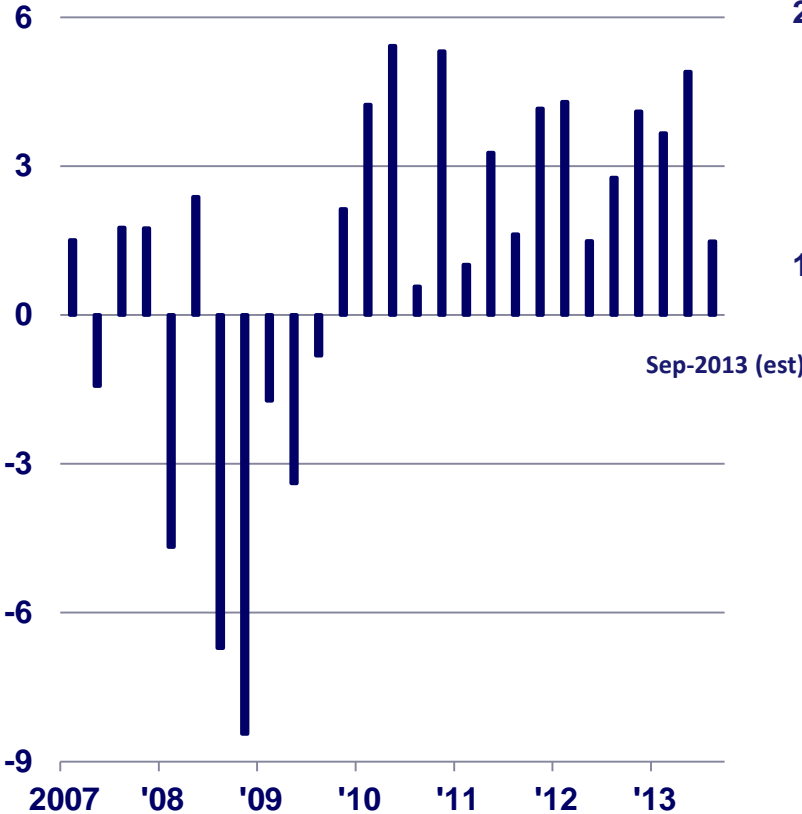
Light Vehicle Sales and Production
(millions of autos and light trucks, SAAR)

Sep-2013 (est)

Sales
Production

Oct-2013
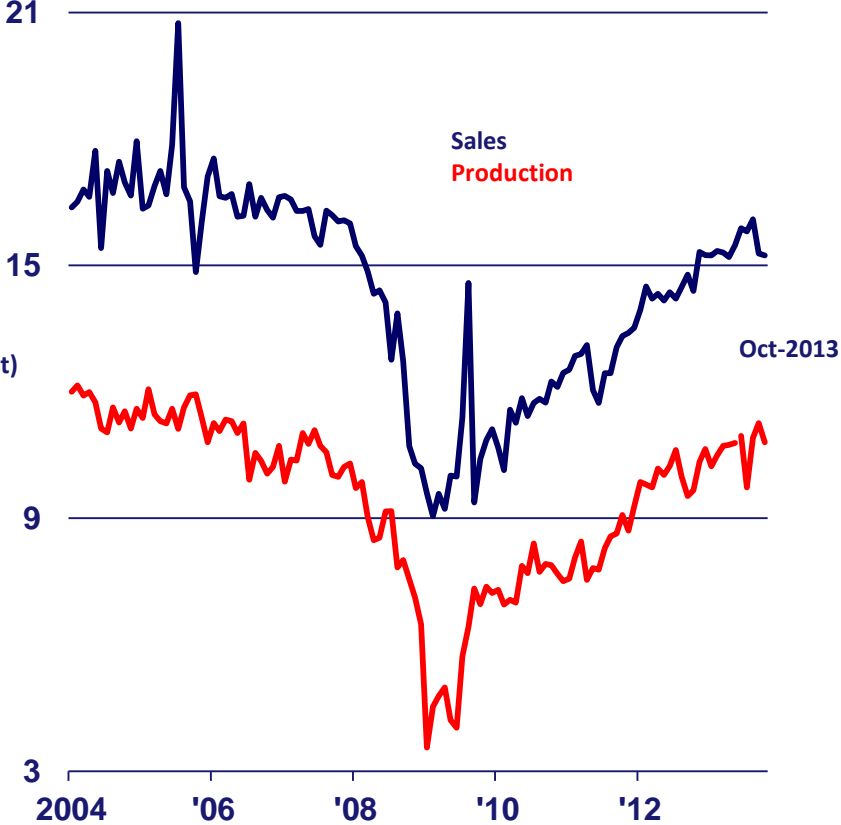
Residential Investment Gradually Improving

Housing Starts
(millions of units, annual rate)

Single Family
Multi Family

Aug-2013
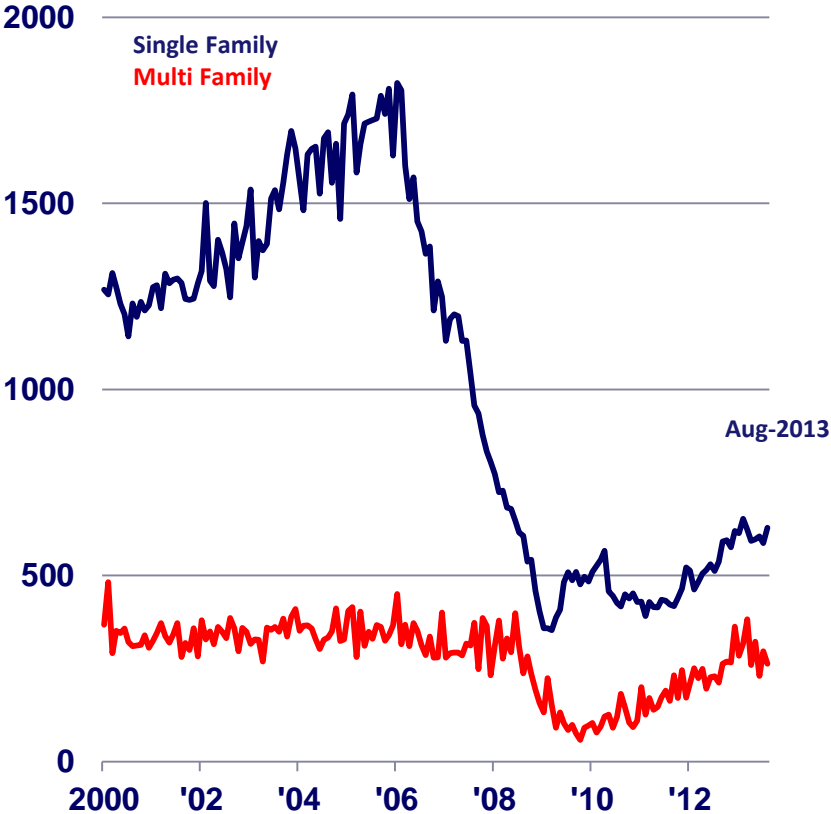
Home Price Indexes
(Q1-2000=100)

Aug-2013

Case-Shiller Composite 20 Price Index
FHFA Purchase Only Price Index
CoreLogic Home Price Index
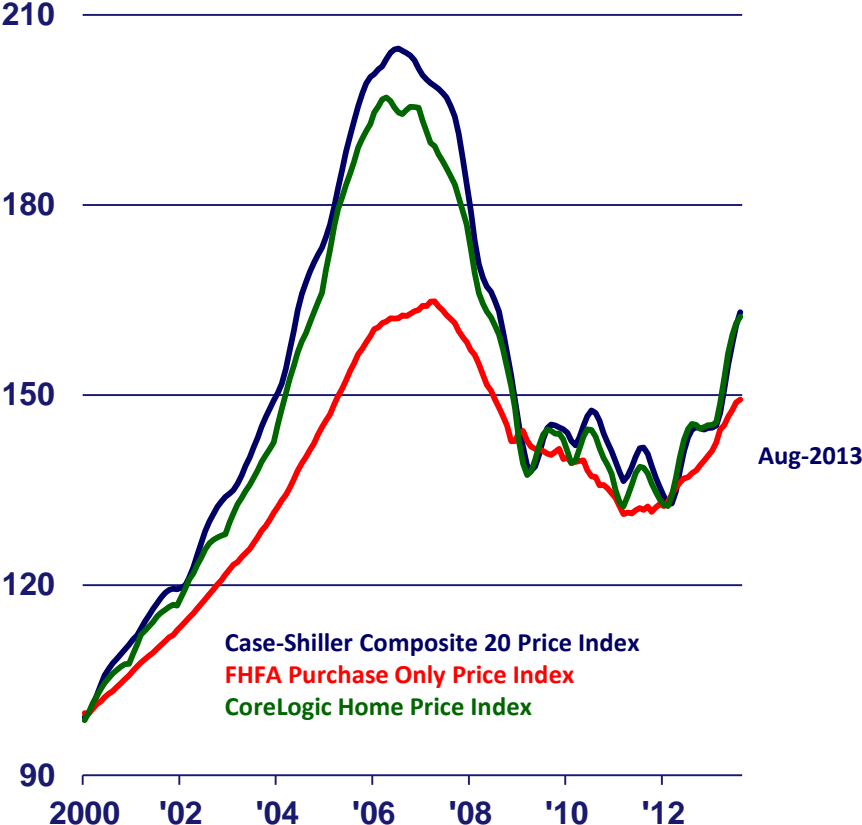
Improving Household Sector Spending

Housing Starts
(millions of units, annual rate)
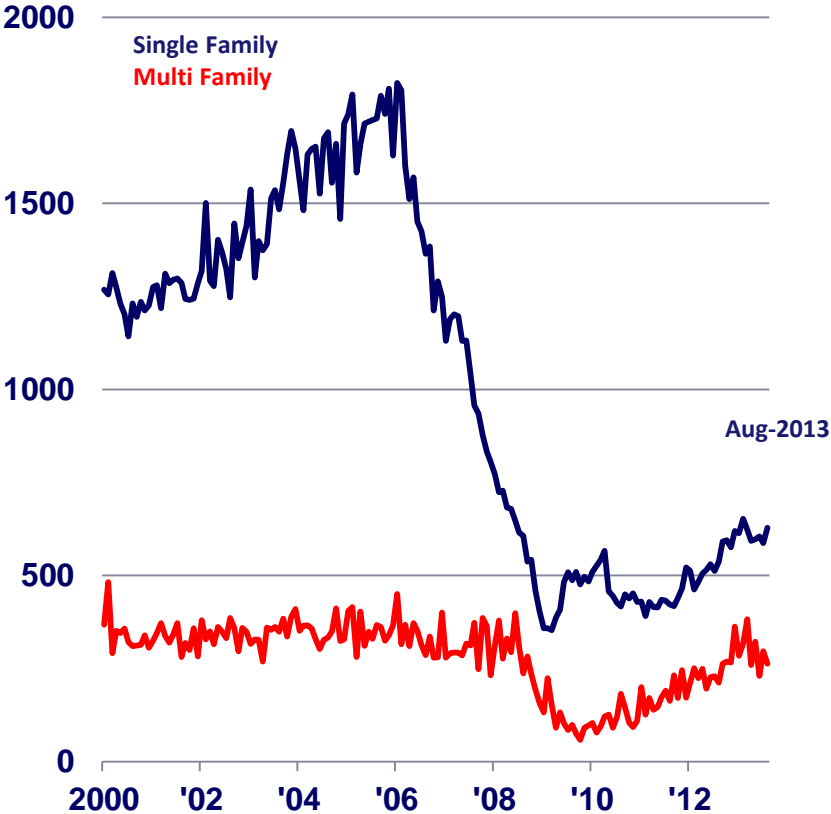
Light Vehicle Sales and Production
(millions of autos and light trucks, SAAR)
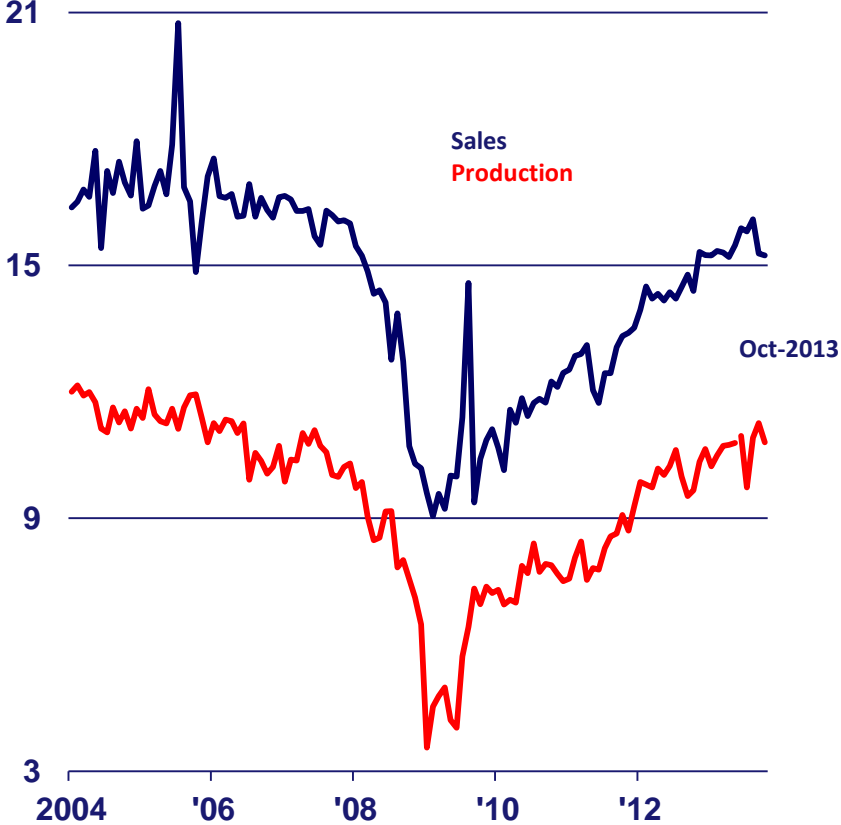
Nonresidential Investment

Nondefense Capital Goods ex. Aircraft
(Bils. $, 3-month MA)

Shipments
New Orders
Sep-2013
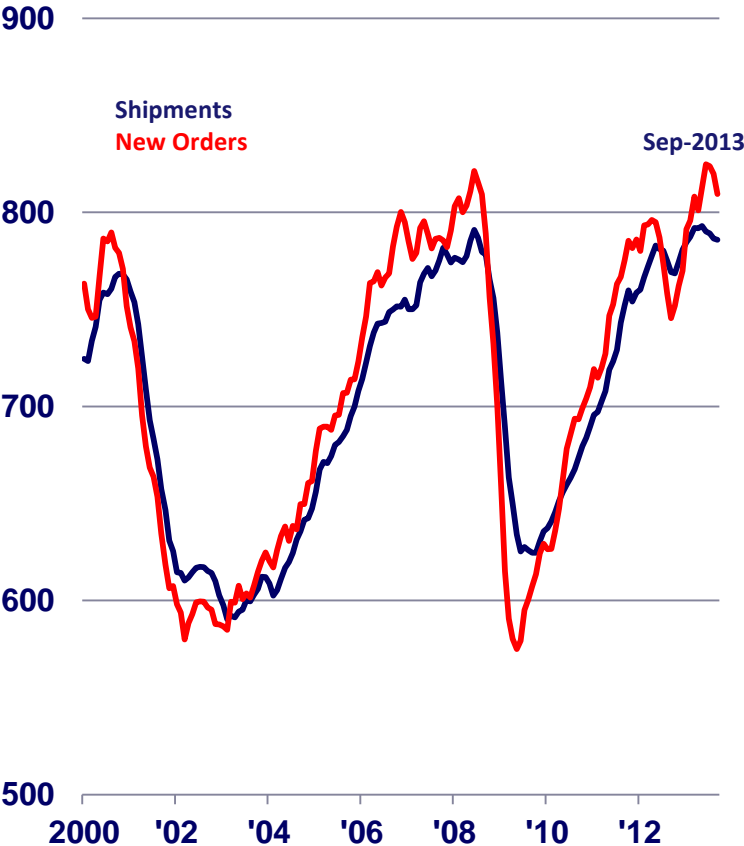
Nonresidential Private Construction
(Bils. $, 3-month MA)

Aug-2013

Economic Activity Indicators: A Summary

Chicago Fed National Activity Index
(standard deviation from trend, 3-month average)

Sep-2013

GDP Forecasts			
	2013		
	Q1	**Q2**	**H2**
Survey of Professional Forecasters	2.5	1.8	2.5
Macroeconomic Advisers	2.5	1.9	2.6

Shading corresponds with NBER recessions

Federal + State and Local Purchases Weak

Government Contributions to Real GDP Growth
(percent)

Historically Unusual

Government Contributions to Real GDP Growth
(percent)

Volatility in Treasury Rates Also Informs Economic Factors for Growth

Ten-Year Treasury Bond Yield
(percent)

FG and FOMC "Appropriate" Policy Rates

Taylor '93
Inertial Taylor '99
6.5% threshold, then inertial Taylor '99

Mkt. Exp:
2014 Q4: 0.30
2015 Q4: 0.91
2016 Q4: 1.76

2013   2014   2015   2016   Long-Run

Optimal Control vs. Taylor Rules

Federal Funds Rate
(percent)

Taylor Rules:
$R_t = 2.0 + \pi_t + 0.5(\pi_t - 2) + \lambda (y_t - y_t^*)$
λ = 1.0   λ = 0.5

Optimal Control:
$\text{Min } (\pi_t - 2)^2 + (u_t - u^n)^2 + \Delta R_t^2$

Optimal Control
Taylor Rule: $\alpha = 1.0$
Taylor Rule: $\alpha = 0.5$
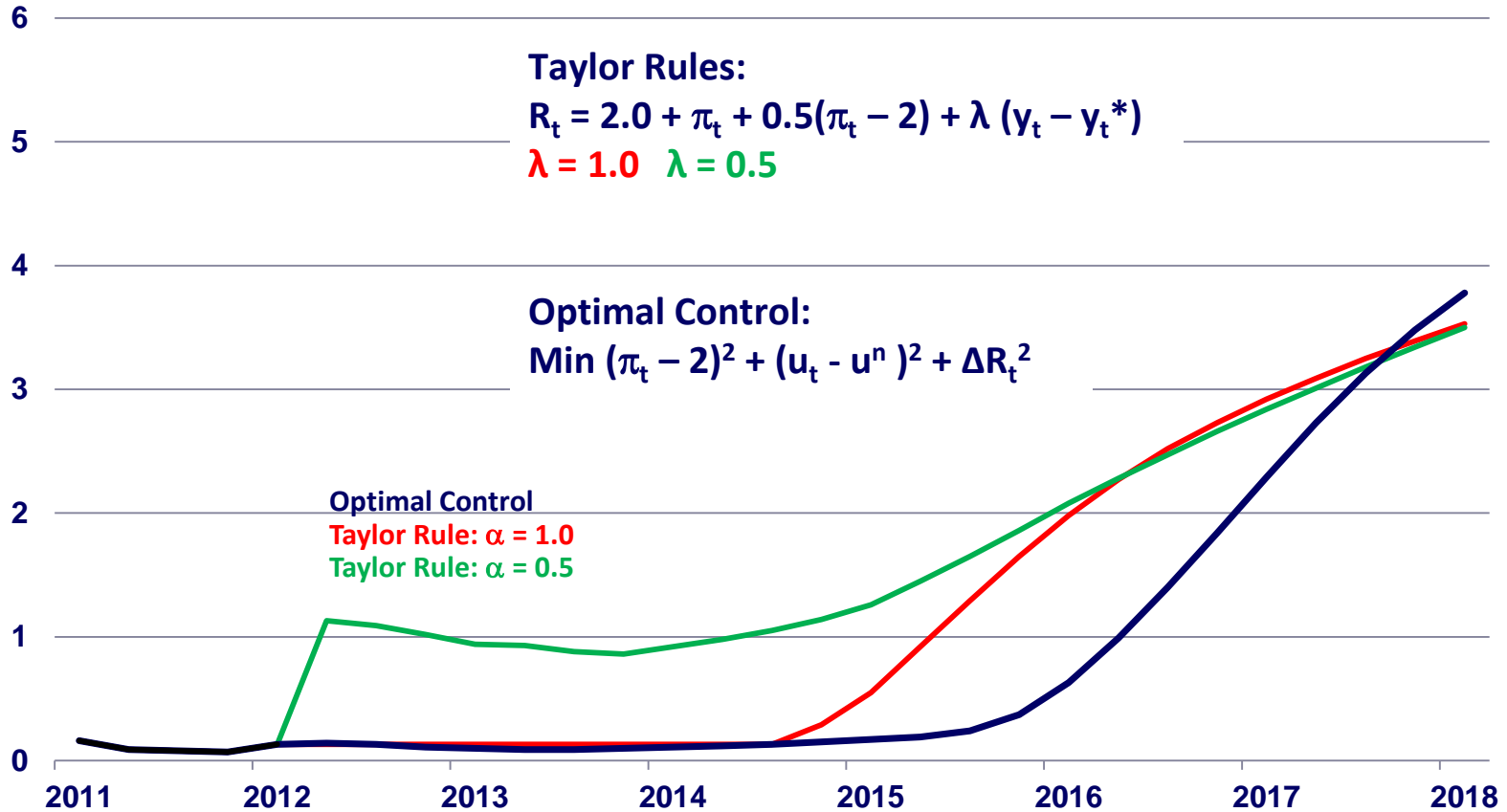
Source: Janet L. Yellen, "Perspectives on Monetary Policy," Boston, June 6, 2012
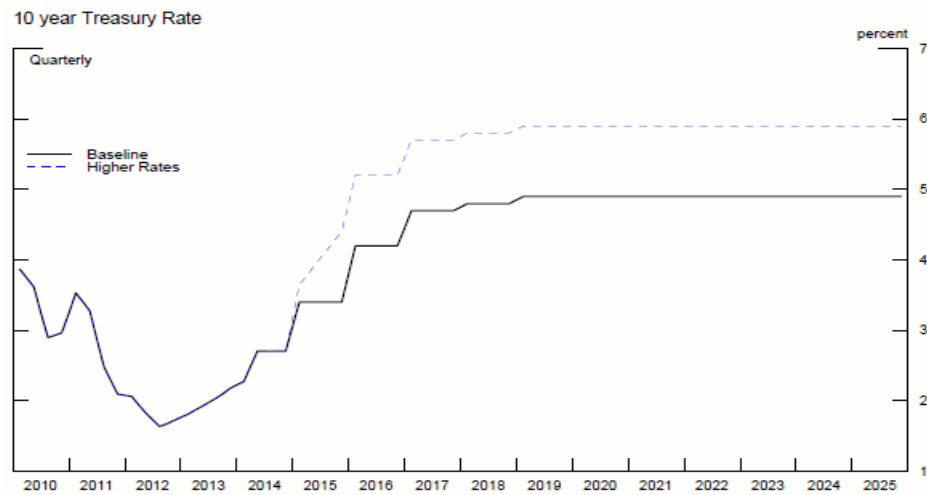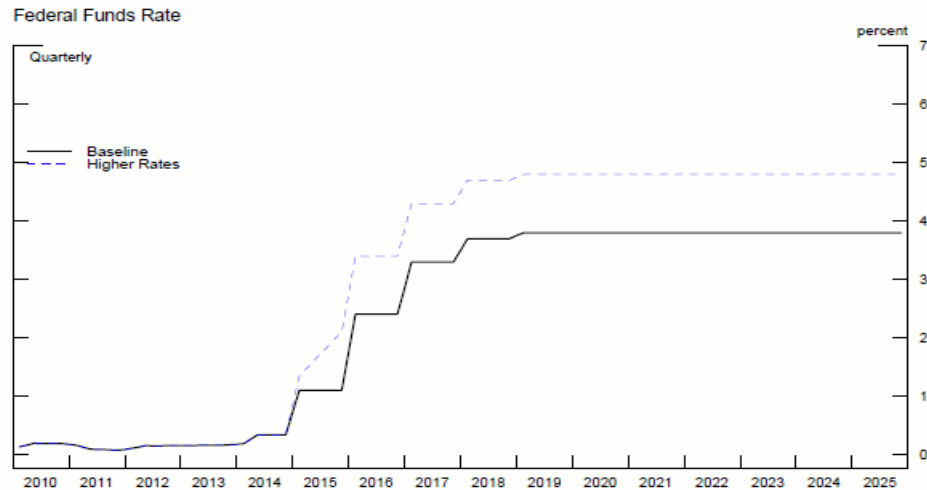
Forecasts Under Alternative Policy Rules

Unemployment Rate
(percent)

Optimal Control
Taylor Rule: α = 1.0
Taylor Rule: α = 0.5

PCE Inflation
(4-quarter percent change)

Optimal Control
Taylor Rule: α = 1.0
Taylor Rule: α = 0.5

Source: Janet L. Yellen, "The Economic Outlook and Monetary Policy," New York, April 11, 2012
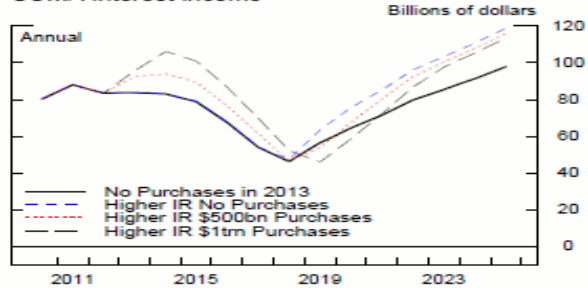
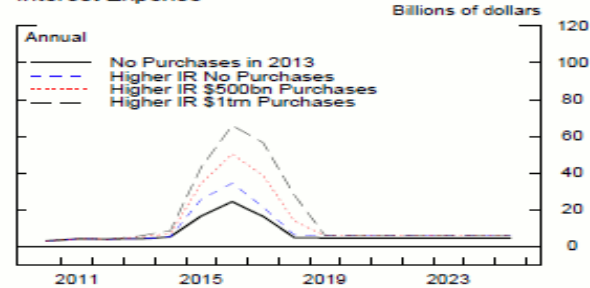# Remittances etc. Carpenter et al. (2013)

Remittances etc. Carpenter et al. (2013)
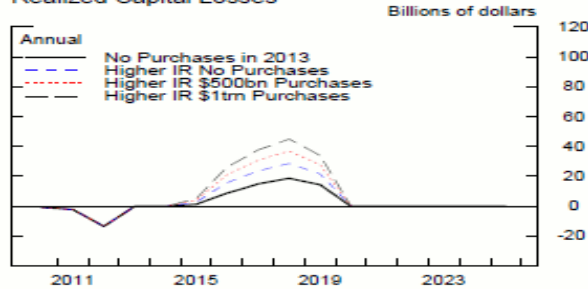
Remittances etc. Carpenter et al. (2013)