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

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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)

*“Median” of Q4-to-Q4 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

\[ \bar{Y} = \bar{A} \bar{K}^{\alpha} \bar{L}^{1-\alpha} \]

- 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 $\alpha$
  
  - e.g.
    
    $L = \text{Labor Force} - \text{Unemployed}$
    
    $\bar{L} = \text{Pop} \times \text{LFP} \left(1 - u^n\right)$
    
    $LPF = \text{labor force participation rate}; \ u^n = \text{natural rate of unemployment}$

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

- **Phillips Curve:**
  
  $\pi = E\pi - \beta \left(u - u^n\right) + \nu$
  
  $\pi = E\pi + \frac{1}{\alpha} \left(Y - \bar{Y}\right) + \nu$
Actual and Potential GDP Level

Actual and Potential GDP (Bils. 2009$)

Actual

CBO Potential

Alternative Potential

Output Gap: $Y - \bar{Y}$

FOMC Forecasts*

Q3-2013

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

Unemployment Rate

Unemployment Rate (percent)

Oct-2013

FOMC Long-Run Projection*

FOMC Forecasts*

CBO NAIRU

*“Median” of Q4-toQ4 forecasts made by the FOMC participants, September 2013
Inflation

PCE Price Index
(12-month percent change)

*“Median” of Q4-to-Q4 forecasts made by the FOMC participants, September 2013
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:  \( \pi = 2 \)

- **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
  \[
  \pi = E\pi + \frac{1}{\alpha} \left( Y - \bar{Y} \right) + \nu
  \]

- 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 $\pi = 0$

**Normal Adjustment**

- Interest rate
- Old IS Curve
- New IS Curve
- Old $r$, New $r$

**Zero Lower Bound**

- Interest rate
- Old IS Curve
- New IS Curve
- Zero Bound $r = 0$
- Output Gap

Assume $\pi = 0$
Aggregate Demand Decline and the ZLB

In real rates, \( r - \pi \)

**Normal Adjustment**

- Old IS Curve
- New IS Curve
- Output Gap
- Equilibrium Rate

**Zero Lower Bound**

- Old IS Curve
- New IS Curve
- Output Gap
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
Policy Rate Constrained By Zero Lower Bound

Fed Funds Rate
(Percent)

Central Tendency of FOMC Long-Run Projection

Taylor Rule: \( r_t = 2.0 + \pi_t + 0.5(\pi_t - 2) + 1.0(y_t - y_t^*) \)
- CBO Gap
- Alt Gap

History
Market Expectations

Taylor Rules use core inflation. Alternative gap based on alternative potential output shown above.
Monetary Policy At The Zero Lower Bound

What to do when can’t cut current 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 ($tp$)

\[ r_{t}^{10} \approx \frac{1}{10} E_{t} \left[ r_{t}^{1} + r_{t+1}^{1} + r_{t+2}^{1} \ldots + r_{t+10}^{1} \right] + tp_{t}^{10} \]

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

- Option 1: Lower expectations of average future 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”
September 2012: “…the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens….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.
December 2012: “Economic conditions likely to warrant exceptionally low level of the funds rate at least as long as the unemployment rate remains above 6-1/2 percent, inflation between one and two years ahead is projected to be no more than a half of a percentage point above the Committee’s 2 percent long-run goal, and longer-term inflation expectations continue to be well-anchored.”
Policymaker’s Optimization Problem

Loss Function in \((\pi, y)\):
\[
L = (\pi - \pi^*)^2 + \lambda (y - y^*)^2
\]

Assume \(\pi^* = 2\%\) and \(\lambda = 0.25\)

Okun’s Law (in levels):
\[
(u - u^n) = 0.5 (y - y^*)
\]

Loss Function in \((\pi, u)\):
\[
L = (\pi - 2)^2 + (u - u^n)^2
\]

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

\(\pi\) - Actual inflation rate

\(\pi^*\) - Inflation target

\(y\) – Output

\(y^*\) - Potential output

\(u\) - Unemployment rate

\(u^n\) - NAIRU
A Policy Loss Function

Loss Function

\[ L = (\pi - \pi^*)^2 + (u - u^n)^2 \]

Source: Charles Evans, “A Mainstream Case for Monetary Accommodation,” Boston, April 13, 2013
Some Optimal Control Monetary Policies

Source: English, Lopez-Salido, and Tetlow (2013)

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

Federal funds rate

Inertial Taylor rule
Optimal (commitment)
Optimal (discretion)

Core PCE inflation (4Q)

Civilian unemployment rate

Output gap
Taylor Rule:

\[ r_t = 2.0 + \pi_t + 0.5(\pi_t - 2) + 1.0(y_t - y_t^*) \]

Source: Interest rate forecasts are from the September 18, 2013 FOMC Summary of Economic Projections; market expectations from OIS futures, September 19, 2013
Option 2: Large Scale Asset Purchases (LSAP)

- LSAP I (11/08): $600 billion agency debt/MBS
- LSAP Ia (3/09): $850 billion agency debt/MBS; $300 billion Treas.
- LSAP II (11/10): $600 billion Treas.
- MEP (9/11): Exchange $400 billion short-term for $400 billion long-term Treas.
- MEP extension (6/12): Extend MEP through end of 2012
- LSAP III (9/12): $40 billion per month MBS, no fixed end date -- "until labor market outlook improved substantially"
- LSAP IIIa (12/12): $40 billion per month MBS and $45 billion per month long-term Treas; no fixed end date
Wide range of estimates: $500 billion LSAP ≈ 20-25 bps on 10-year Treasury
Long-Term Rates Down Significantly

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

08-Nov-2013W
Empirical Facts about Term Premia

Chart 2. Decomposition of 10-Year Treasury Yield

Monthly

- 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.

Structure of the Fed and FOMC Meetings
Federal Reserve Districts

[Map showing the Federal Reserve Districts of the United States with numbers 1 through 12 corresponding to different districts.]
Nice Marble

Board of Governors

Chicago Fed
The Federal Reserve Board of Governors*

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

**Not voting pending Treasury confirmation.
Presidents of the District Reserve Banks

* 2013 voting FOMC member

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
FOMC Meetings
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)
Short-Run Monetary Non-Neutrality

- Evidence from Christiano, Eichenbaum, and Evans (2005)

![Graphs showing growth rate of money, output, consumption, and inflation (APR)]
International Trade – Exchange Rates

**Broad Trade-Weighted Dollar**
(Index, Jan-97=100)

**Major Foreign Currency Exchange Rates**
(Exchange rates expressed as Foreign Currency/USD)

08-Nov-2013
Inflation Expectations

**TIPS Inflation Compensation (percent)**

- 5-10yr ahead

**University of Michigan Median Inflation (percent)**

- 5 to 10 Year
- 1-Year

**Dates:**
- 12-Nov-2013
- Nov-2013
Labor Market

Private Nonfarm Payroll Employment
(change, thousands)

Monthly Change
3-month average

Oct-2013

Unemployment and Participation Rates
(percent)

Unemployment Rate (percent of labor force)

Participation Rate (percent of population 16 and over)

Oct-2013

2005 '06 '07 '08 '09 '10 '11 '12 '13

0

300

600

-300

-600

-900

2005 '06 '07 '08 '09 '10 '11 '12 '13

0

60

120

180

240

300

360

420

480

540

600

0

2

4

6

8

10

12

14

2005 '06 '07 '08 '09 '10 '11 '12 '13

0

30

60

90

120

150

180

210

240

270

300

330

360

390

420

450

480

510

540

570

600

63
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)
Residential Investment Gradually Improving

**Housing Starts**
(millions of units, annual rate)

**Home Price Indexes**
(Q1-2000=100)

- 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)

**Nonresidential Private Construction**
(Bils. $, 3-month MA)
Economic Activity Indicators: A Summary

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

GDP Forecasts

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<td>Q1</td>
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Survey of Professional Forecasters

Survey of Professional Forecasters

Macroeconomic Advisers
Federal + State and Local Purchases Weak

Government Contributions to Real GDP Growth (percent)

Q3-2013
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)

- QE 1
- Swap lines
- Jackson Hole QE 2
- Debt limit showdown
- MEP
- QE 3
- JEC

2008 '09 '10 '11 '12 '13

0.75 1.50 2.25 3.00 3.75 4.50

15-Nov-2013
FG and FOMC “Appropriate” Policy Rates

Source: Interest rate forecasts are from the September 18, 2013 FOMC Summary of Economic Projections; market expectations from OIS futures, September 19, 2013
Optimal Control vs. Taylor Rules

Federal Funds Rate
(percent)

Taylor Rules:
\[ R_t = 2.0 + \pi_t + 0.5(\pi_t - 2) + \lambda (y_t - y_t^*) \]
\[ \lambda = 1.0 \quad \lambda = 0.5 \]

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

Source: Janet L. Yellen, “Perspectives on Monetary Policy,” Boston, June 6, 2012
Forecasts Under Alternative Policy Rules

Unemployment Rate
(percent)

PCE Inflation
(4-quarter percent change)

Remittances etc. Carpenter et al. (2013)
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