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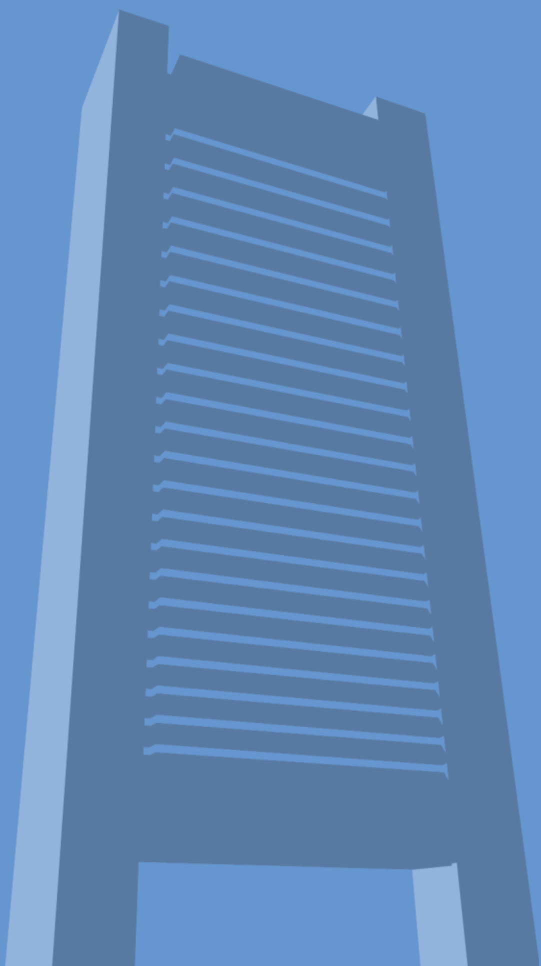

Changing Economic Relationships: Implications for Monetary Policy and Simple Monetary Policy Rules

Eric S. Rosengren
President & CEO
Federal Reserve Bank of Boston

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Chatham House
London, England

bostonfed.org

March Monetary Policy Statement

- Mentioned criteria for raising rates in the United States
  - “Further improvement in the labor market”
  - “Reasonably confident that inflation will move back to its 2 percent objective over the medium term”
- In essence, will we reach full employment and our inflation goal in a reasonable time frame?

Have the Conditions Been Met?

- At this time, I do not think that either condition has been met
  - In March, the U.S. economy created only 126,000 net new jobs, and the unemployment rate was unchanged at 5.5 percent
  - Core PCE inflation in the United States is 1.4 percent with no clear indication of when it will return to the Federal Reserve's stated inflation target of 2 percent

Forecasts by Monetary Policymakers

- In the U.S., the FOMC releases the quarterly projections of Fed Governors and Presidents, called the Summary of Economic Projections (SEP)
- Notable changes in the most recent SEP:
  - Lower forecasts for short-term rates at the end of 2015
  - Changes in longer-run expectations of FOMC participants
    - Striking reduction in the estimates of the unemployment rate that FOMC participants expect to see in the longer run
    - Reduction in the level of the federal funds rate that participants expect to see in the longer run

Relevance of these Changes in Expectations for Unemployment and the Federal Funds Rate in the Longer Run

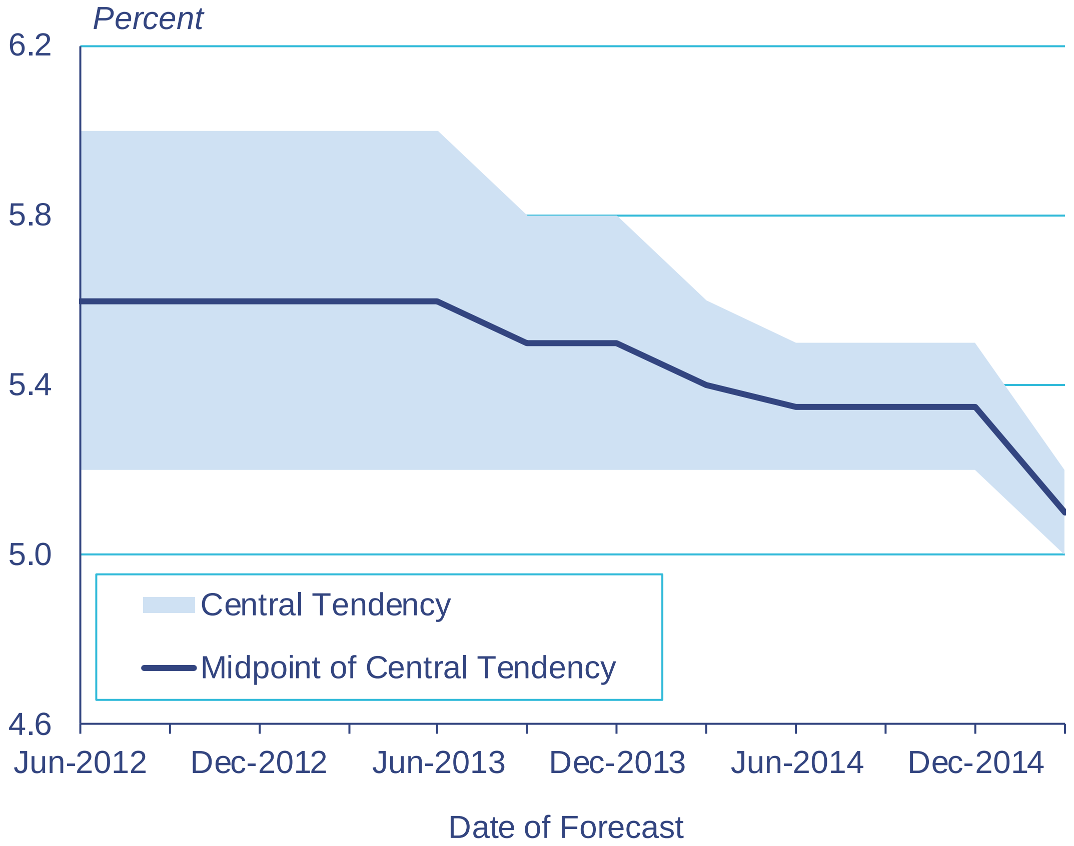
- Relevant to when and how much short-term interest rates should increase
- These measures are also relevant to the discussion of how best to utilize simple monetary policy rules, a topic discussed by members of Congress and Chair Yellen at recent hearings
- These key variables *can* change – and, according to SEP submissions, *have* changed significantly over the past three years. They are assumed to be constant in simple monetary rules

The Federal Reserve's Dual Mandate

- The inflation goal is quite explicit – a 2 percent annualized rate of inflation, as measured by the PCE price index
- Full employment, by contrast, has a more ambiguous target
  - "The maximum level of employment is largely determined by non-monetary factors that affect the structure and dynamics of the labor market"
  - "These factors may change over time and may not be directly measurable"

Figure 1: Longer-Run U.S. Unemployment Rate Projections of Federal Reserve Governors and Federal Reserve Bank Presidents

June 2012 - March 2015

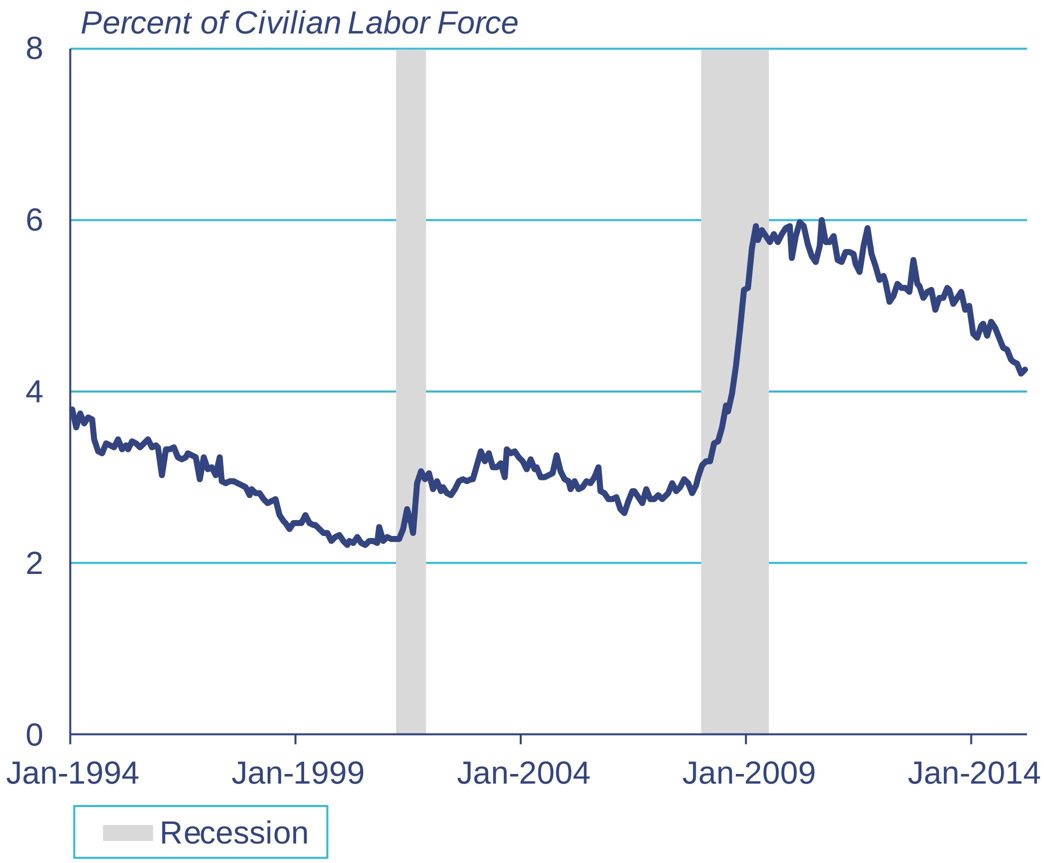


Note: The central tendency excludes the three highest and three lowest projections in each period.

Source: FOMC, Summary of Economic Projections (SEP)

Figure 2: Persons Employed Part Time for Economic Reasons in the U.S.

January 1994 - March 2015

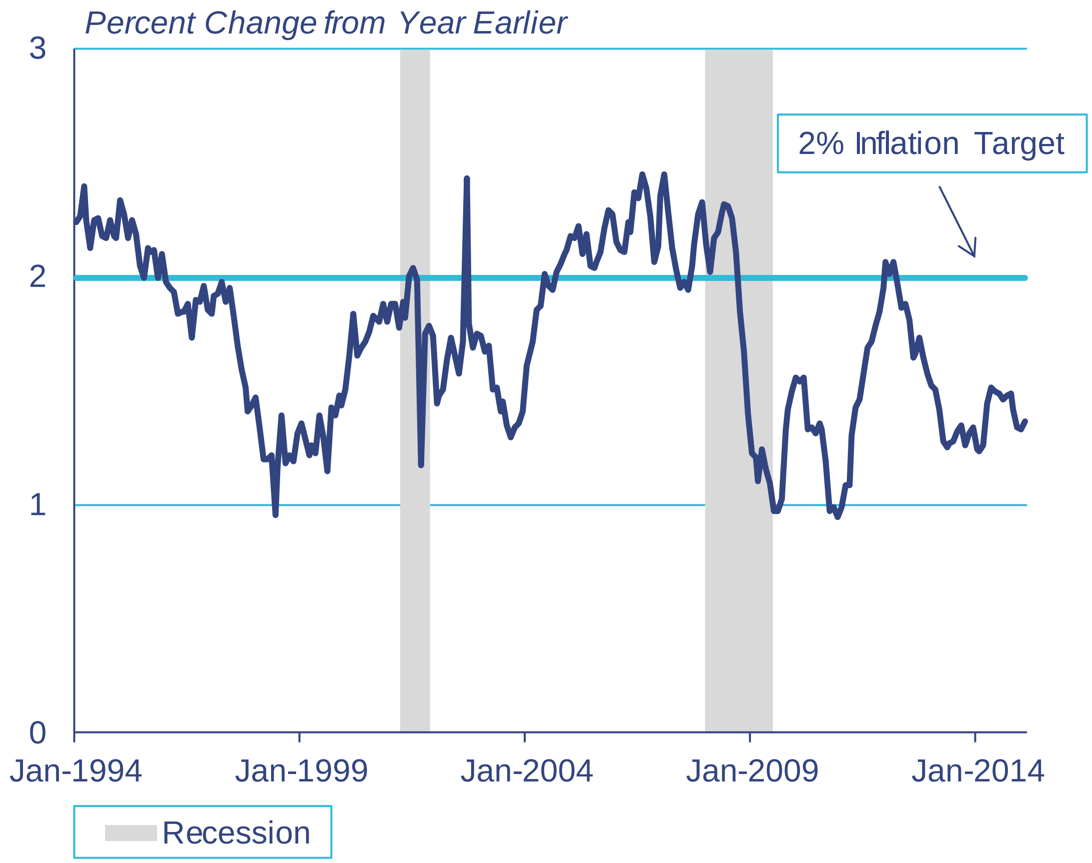


Note: "Refers to those who worked 1 to 34 hours during the reference week for an economic reason such as slack work or unfavorable business conditions, inability to find full-time work, or seasonal declines in demand."

Source: BLS, NBER, Haver Analytics

Figure 3: U.S. Inflation Rate: Change in Core Personal Consumption Expenditures Price Index

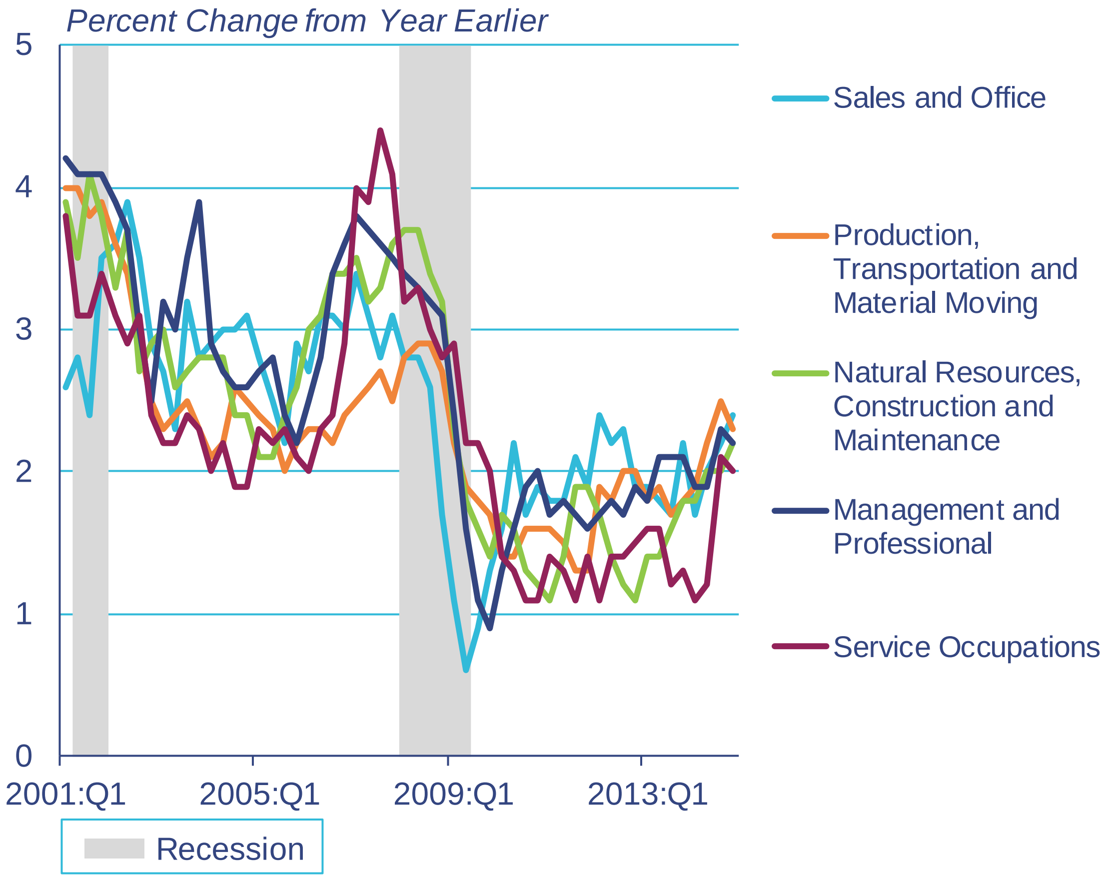
January 1994 - February 2015



Source: BEA, NBER, Haver Analytics

Figure 4: U.S. Employment Cost Index for Wages and Salaries for Private Industry Workers by Occupational Group

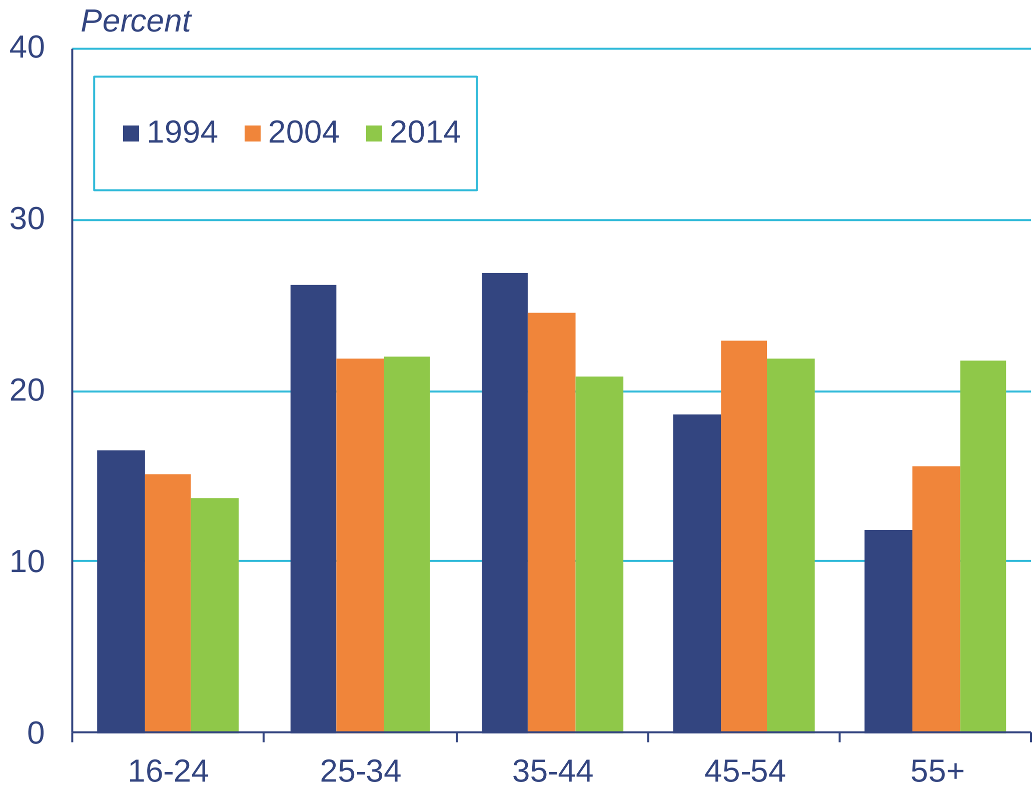
2001:Q1 - 2014:Q4



Source: BLS, NBER, Haver Analytics

Figure 5: Age Distribution of the U.S. Civilian Labor Force

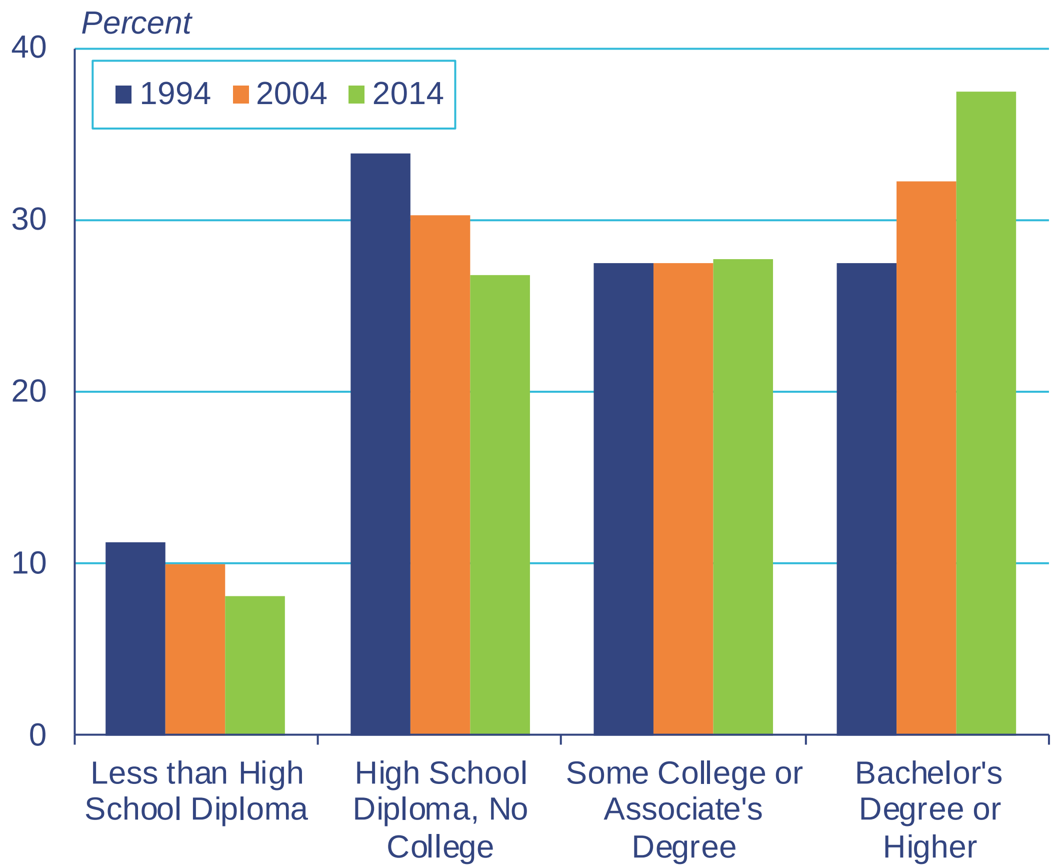
1994, 2004, and 2014



Source: BLS, Haver Analytics

Figure 6: U.S. Civilian Labor Force, Age 25 Years and Older, by Educational Attainment

1994, 2004, and 2014



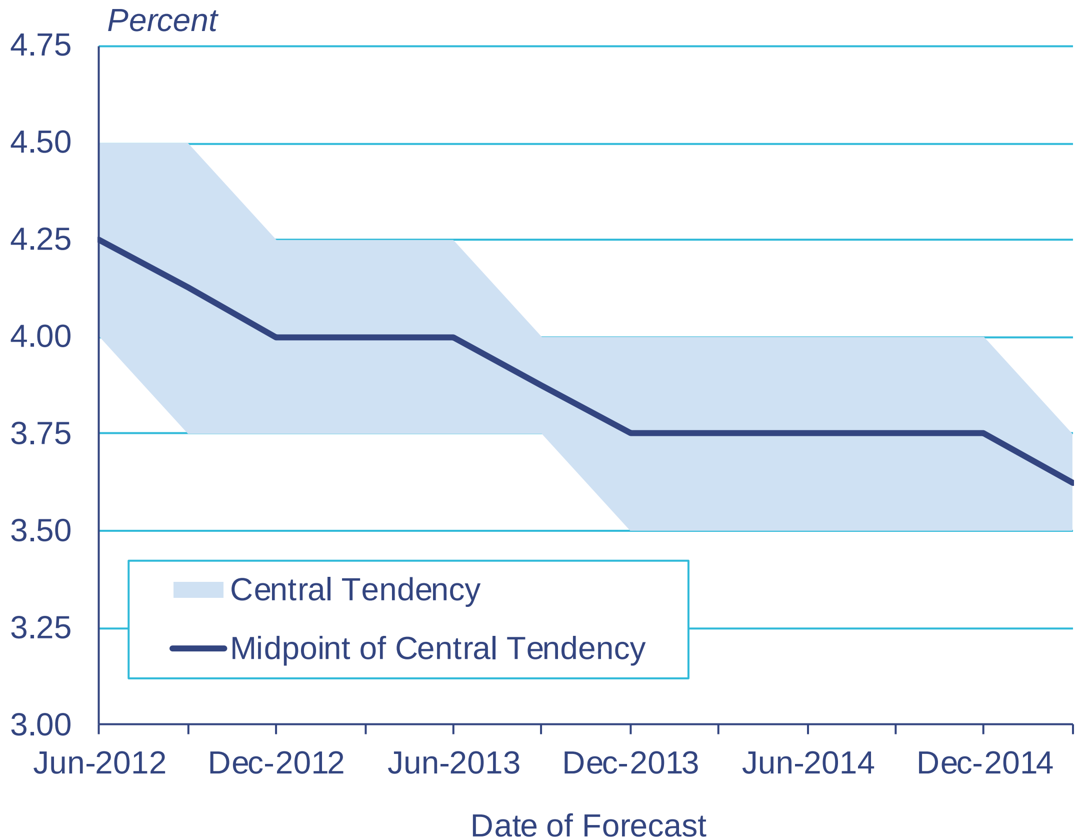
Source: BLS, Haver Analytics

Implications

- The unemployment rate that is consistent with full employment appears to have declined
- Estimates of full employment can and do change
- SEP suggests many policymakers are reacting to data and indicating a lower estimate of full employment
- Simple rules that assume the full employment level of unemployment is constant could provide misleading guideposts for setting monetary policy

Figure 7: Longer-Run U.S. Federal Funds Rate Projections of Federal Reserve Governors and Federal Reserve Bank Presidents

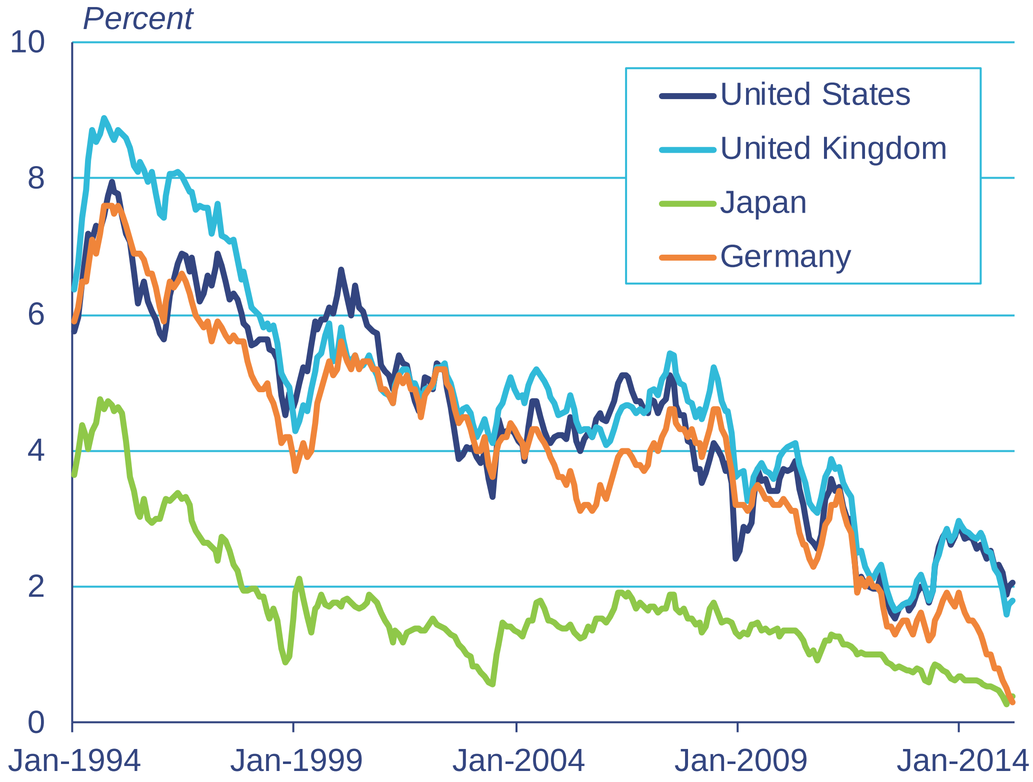
June 2012 - March 2015



Source: FOMC, Summary of Economic Projections (SEP)

Figure 8: Ten-Year Government Bond Yields

January 1994 - March 2015

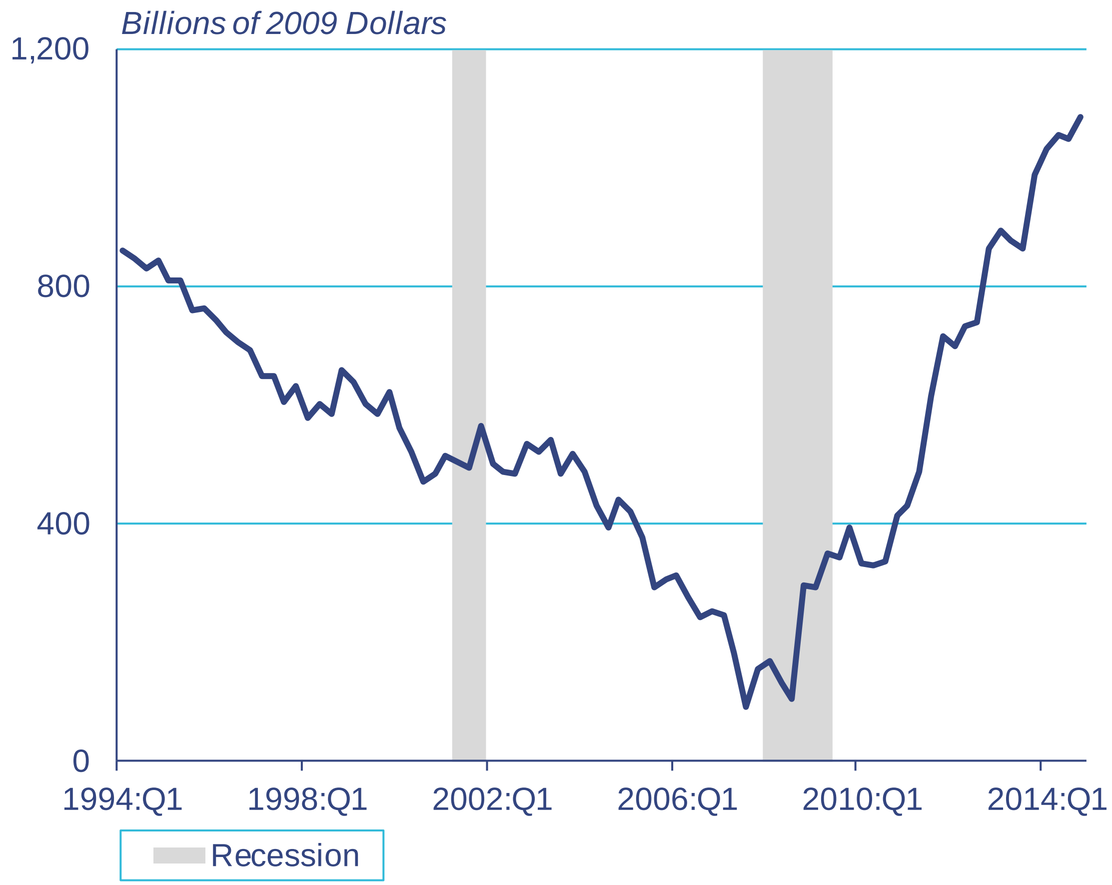


Note: Germany's bond yield is the yield on federal government securities with a residual maturity of 9 to 10 years.

Source: U.S. Treasury, Bank of England, Deutsche Bundesbank, Japan's Ministry of Finance, Haver Analytics

Figure 9: Checkable Deposits and Currency of U.S. Households and Nonprofit Organizations

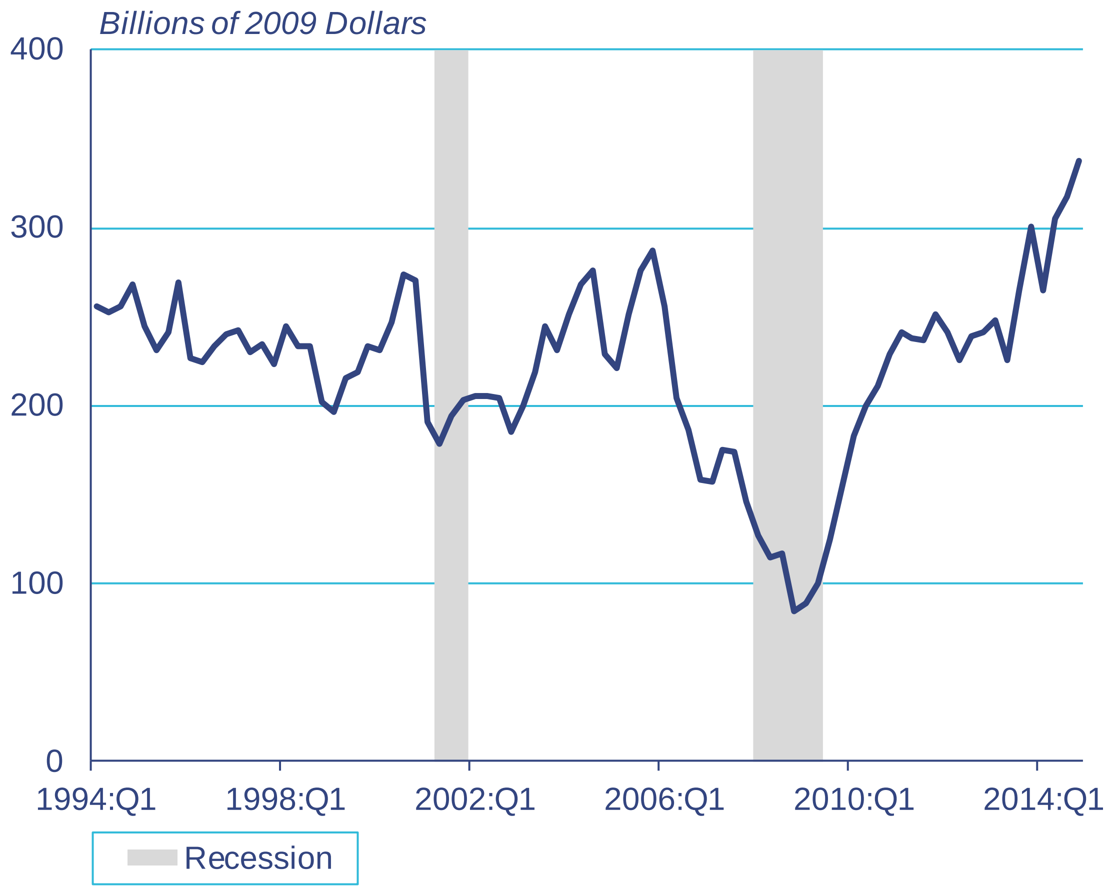
1994:Q1 - 2014:Q4



Source: Federal Reserve Board, NBER, Haver Analytics

Figure 10: Checkable Deposits and Currency of U.S. Nonfinancial Corporate Businesses

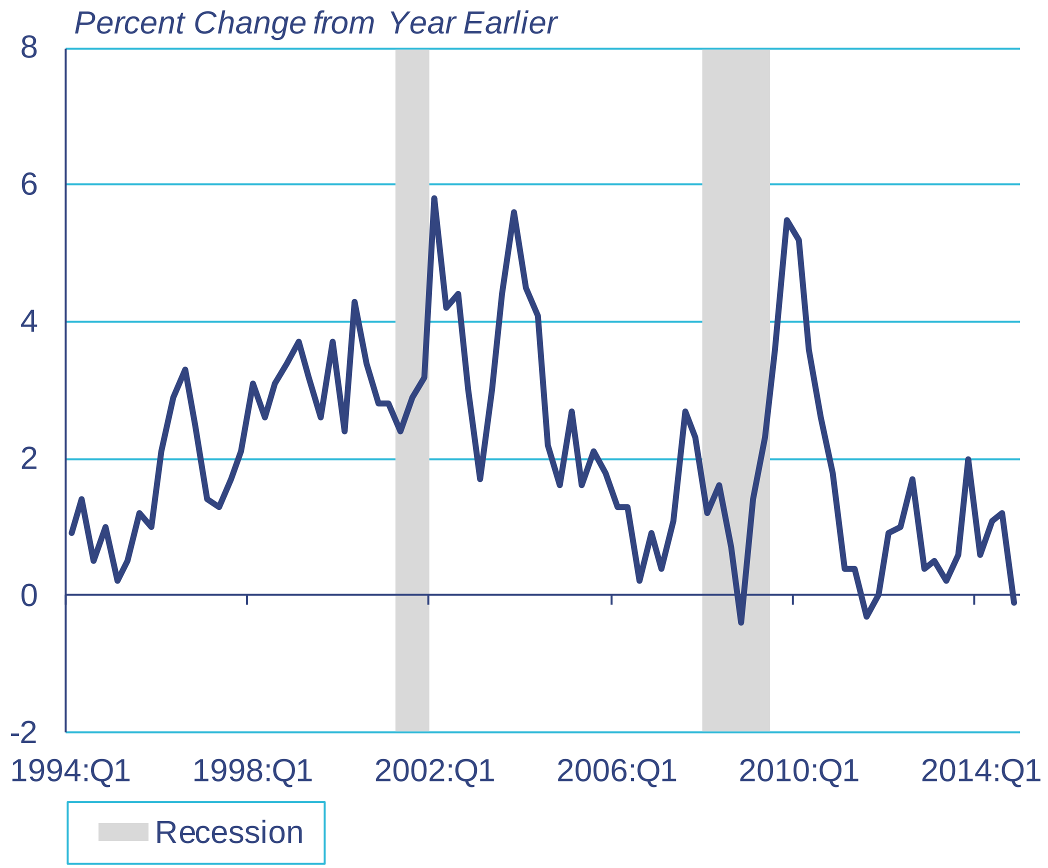
1994:Q1 - 2014:Q4



Source: Federal Reserve Board, NBER, Haver Analytics

Figure 11: U.S. Productivity: Real Output Per Hour, Nonfarm Business, All Persons

1994:Q1 - 2014:Q4



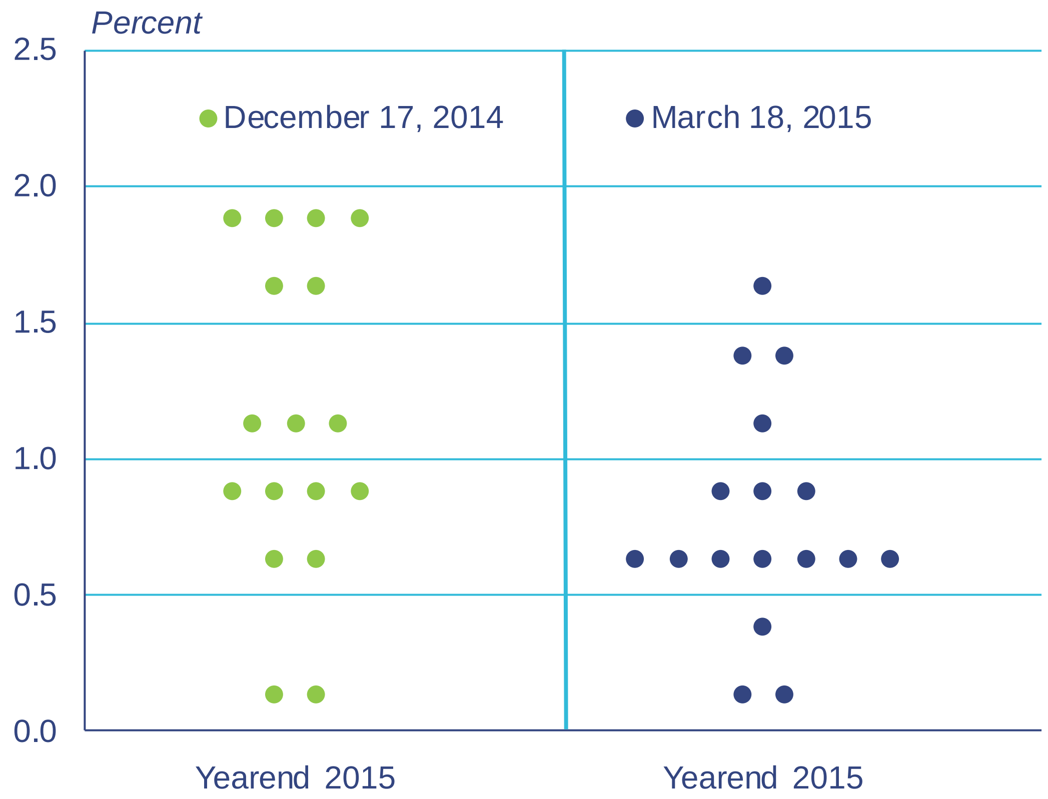
Source: BLS, NBER, Haver Analytics

Implications of Lower Longer-Run, or Equilibrium, Federal Funds Rates

- Rates do not need to rise as much to return to "normalized" interest rates
- Less room to lower interest rates in the event of economic weakness before hitting the zero bound – which has implications for the inflation target
- Real interest rate may change in both the intermediate and longer runs – further rationale for looking beyond simple monetary rules

Figure 12: U.S. Federal Funds Rate Projections for Yearend 2015 of Federal Reserve Governors and Federal Reserve Bank Presidents

December 17, 2014 and March 18, 2015



Source: FOMC, Summary of Economic Projections (SEP)

Concluding Observations

- Simple rules are too simple to set policy
  - Variables assumed not to change, can and do change
  - Simple policy rules have implied tighter policy for some time, even though we have not reached full employment or the inflation target
- While not effective to set policy, they can be useful benchmarks
- Monetary policy requires judgment – we face uncertainties in estimating all of the economic relationships that operate in our complex economies