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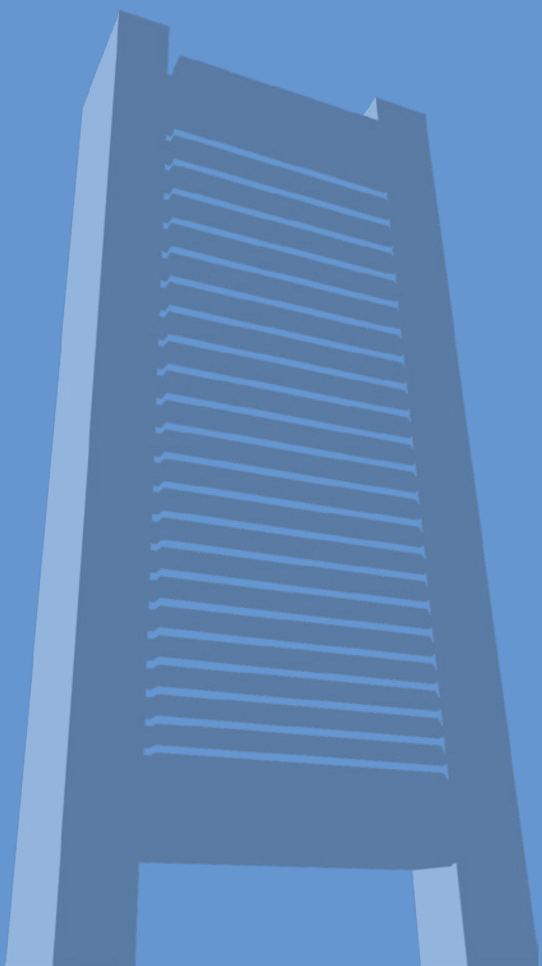

“Monetary Policy Normalization: Graceful Exit or Bumpy Ride?”

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Madison, Wisconsin

Economic Conditions Continue to Improve

- Monetary policy quite stable in 2014
  - New Chair and Vice Chair
  - End of bond purchase program and revised exit strategy
  - Moved from forward guidance tied to specific unemployment rate to a "patient" policy
- 2014 surprises
  - Unemployment fell more than expected
  - Inflation remains below target
  - U.S. stock market rose while long-term rates fell
- As "graceful exit or bumpy ride" in panel title implies, such good fortune cannot be automatically assumed in 2015

Is Policy Already Too Patient?

- Rate increases after previous recession, in June 2004, occurred with:
  - Unemployment at 5.6 percent
  - Inflation at 2.8 percent
- By that standard we have not been unusually patient yet
- Note that macro models predict little difference in outcomes from small adjustments in the timing of liftoff

My Comments Today Cover

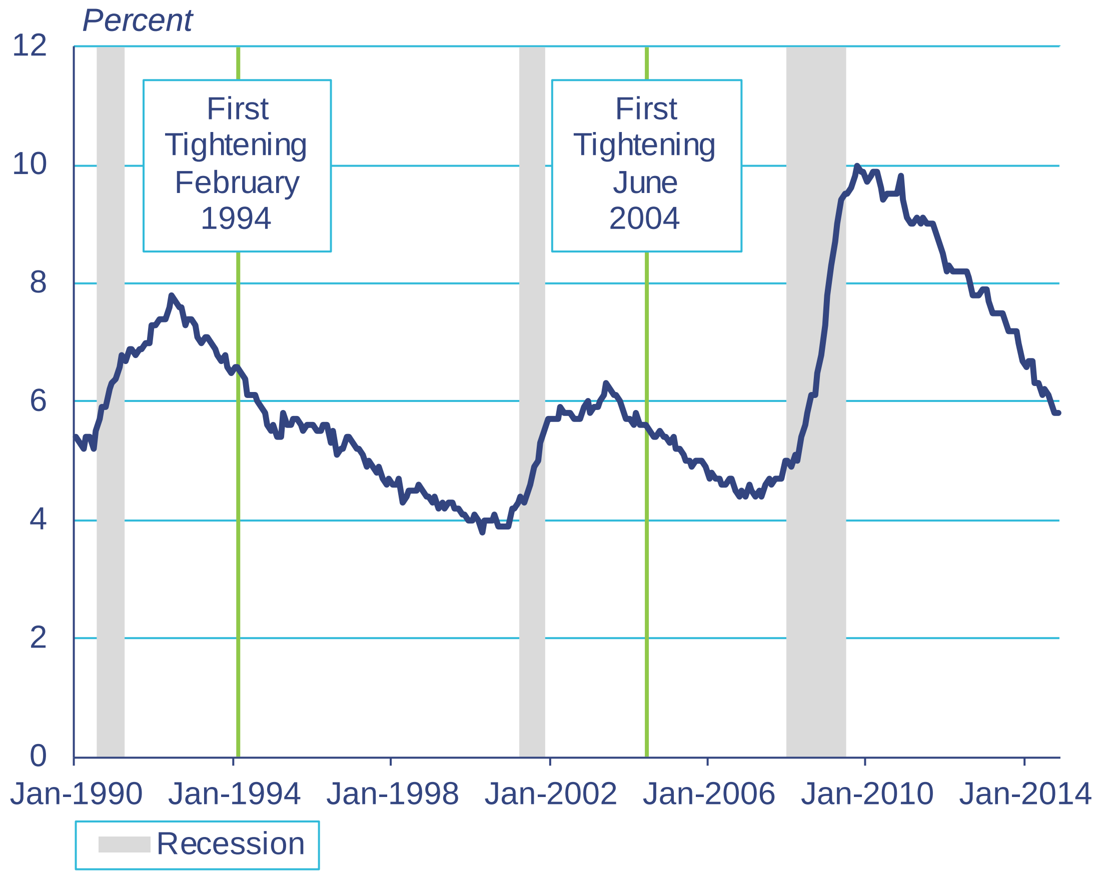
- Comparing current economic conditions to those at last two rate liftoffs in previous recoveries
- Differences this time that may complicate normalizing policy
- The impact of previous liftoffs
- What history portends – whether this time will be different

Economic Conditions as Context for Monetary Policy Tightening

- Condition of economy relative to Fed's dual mandate
- Speed at which dual mandate goals will likely be obtained
- Likelihood the recovery is sustainable
- Past actions are an imperfect guide to likely future actions/normalization strategy – but indicate factors that should be considered

Figure 1: Civilian Unemployment Rate

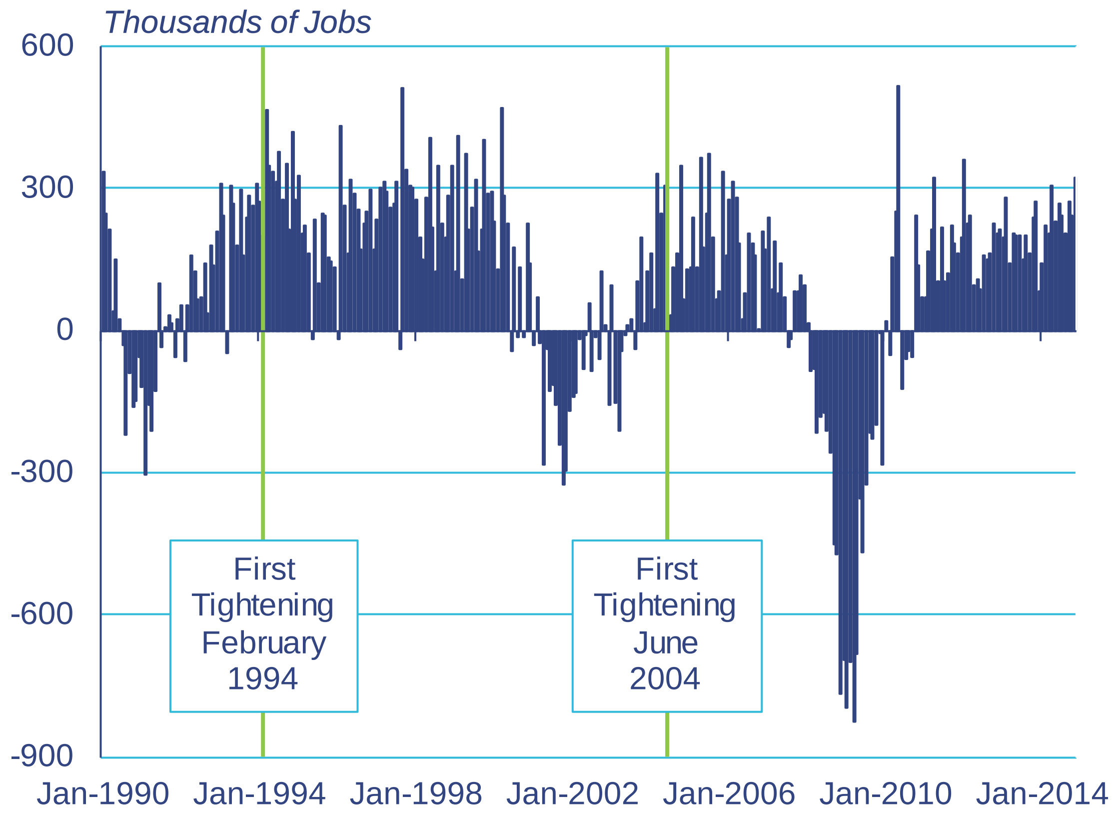
January 1990 - November 2014



Source: BLS, NBER, Haver Analytics

Figure 2: Payroll Employment Growth

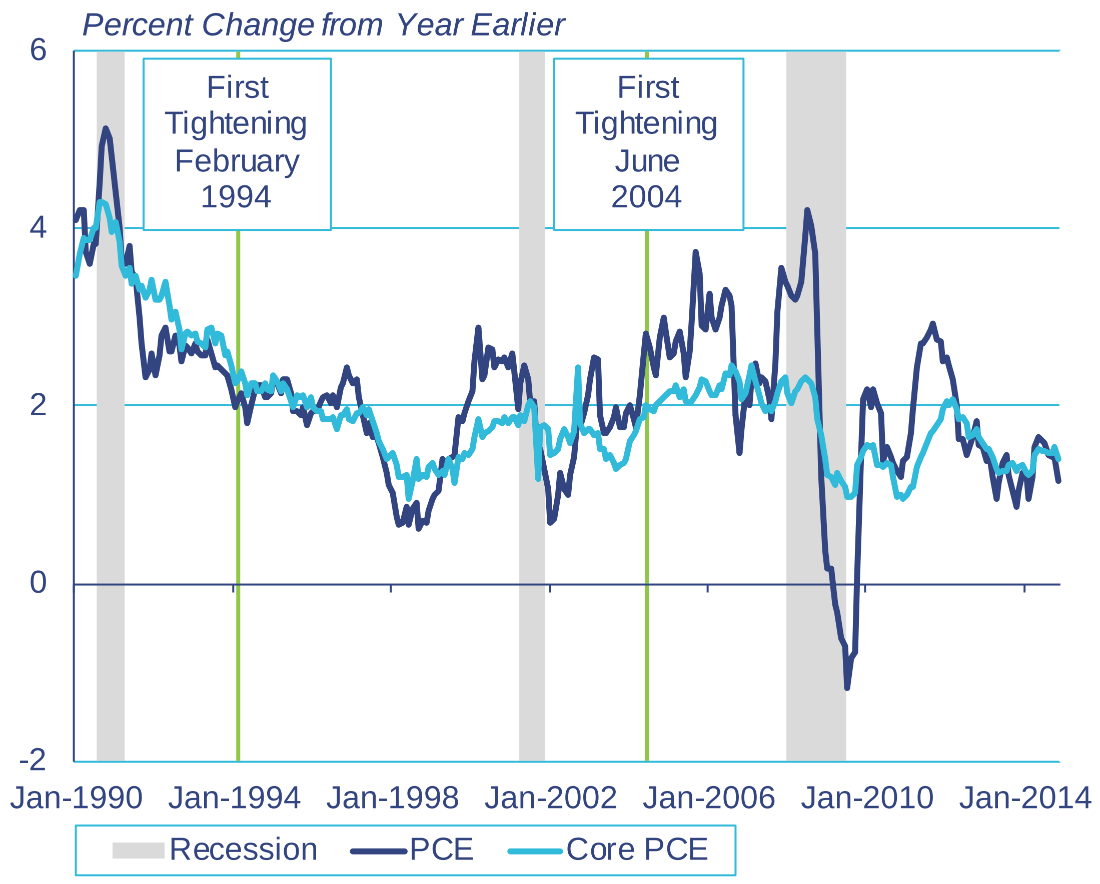
January 1990 - November 2014



Source: BLS, Haver Analytics

Figure 3: Inflation Rate: Change in Total and Core Personal Consumption Expenditure Price Indices

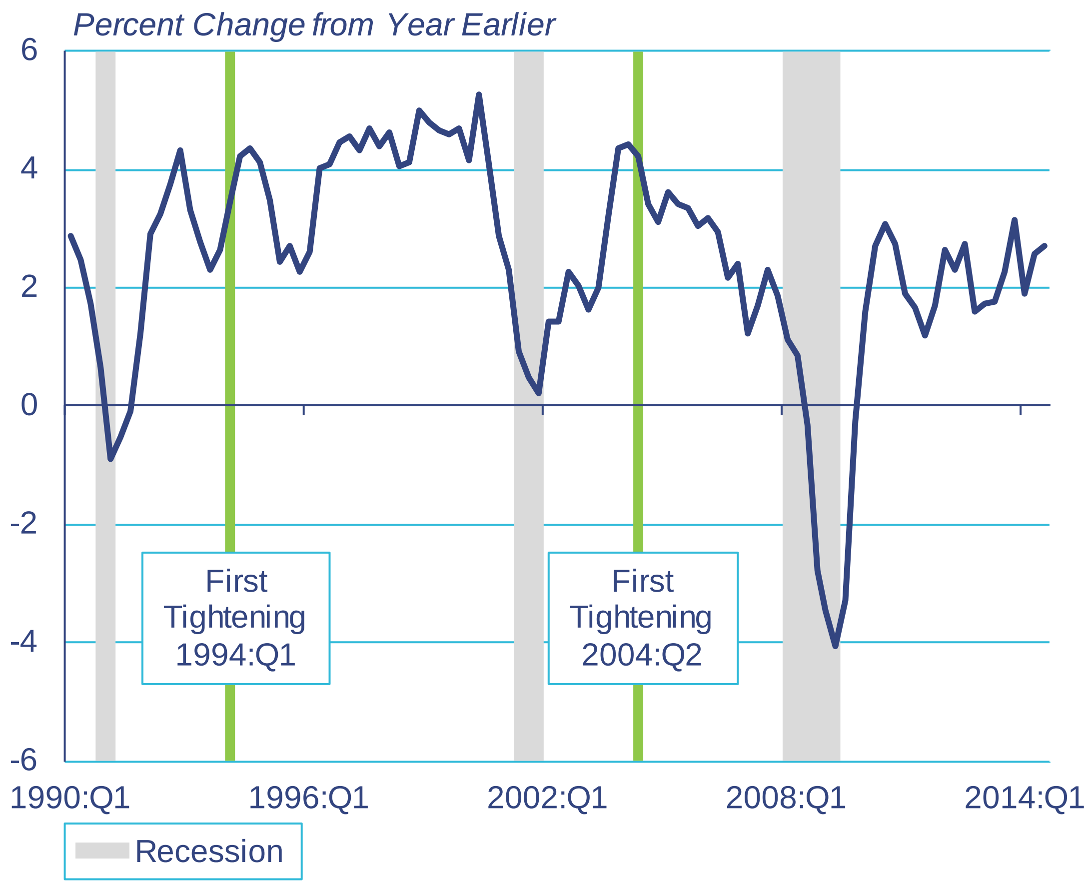
January 1990 - November 2014



Source: BEA, NBER, Haver Analytics

Figure 4: Growth in Real GDP

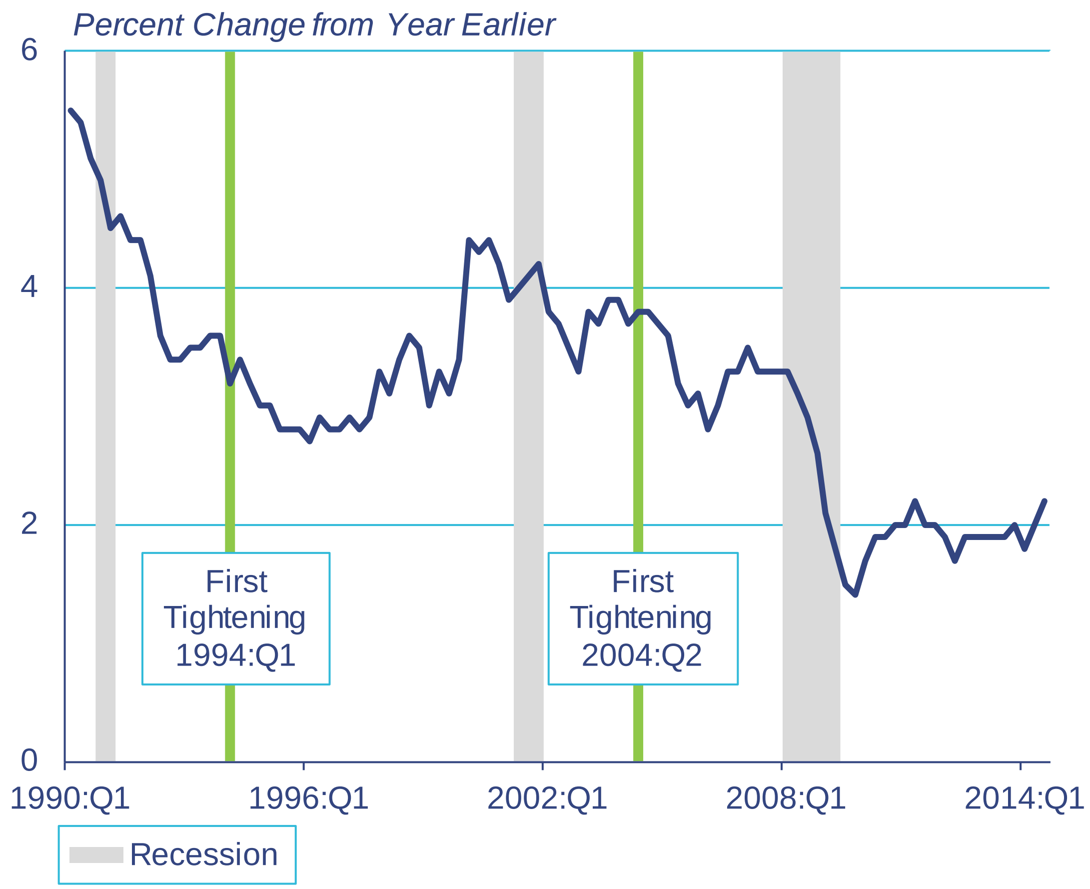
1990:Q1 - 2014:Q3



Source: BEA, NBER, Haver Analytics

Figure 5: Employment Cost Index for Total Compensation for Civilian Workers

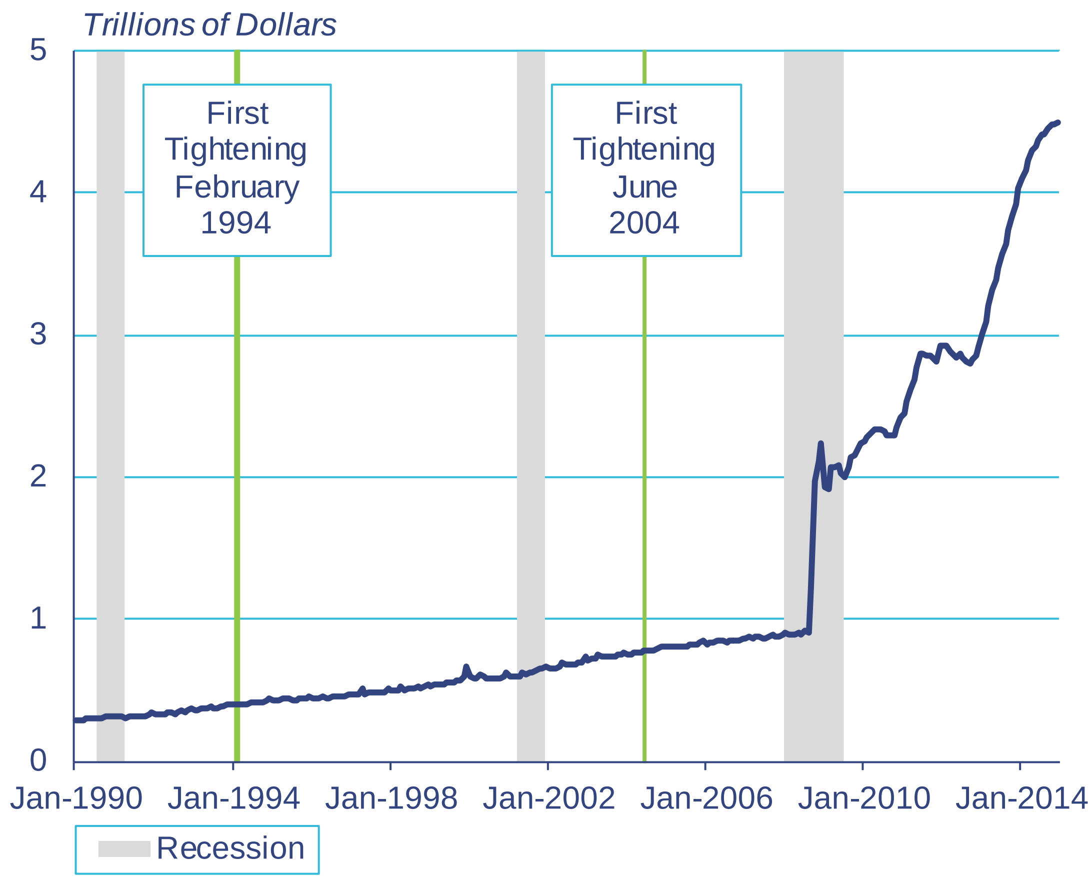
1990:Q1 - 2014:Q3



Source: BLS, NBER, Haver Analytics

Figure 6: Federal Reserve System Assets

January 1990 - December 2014



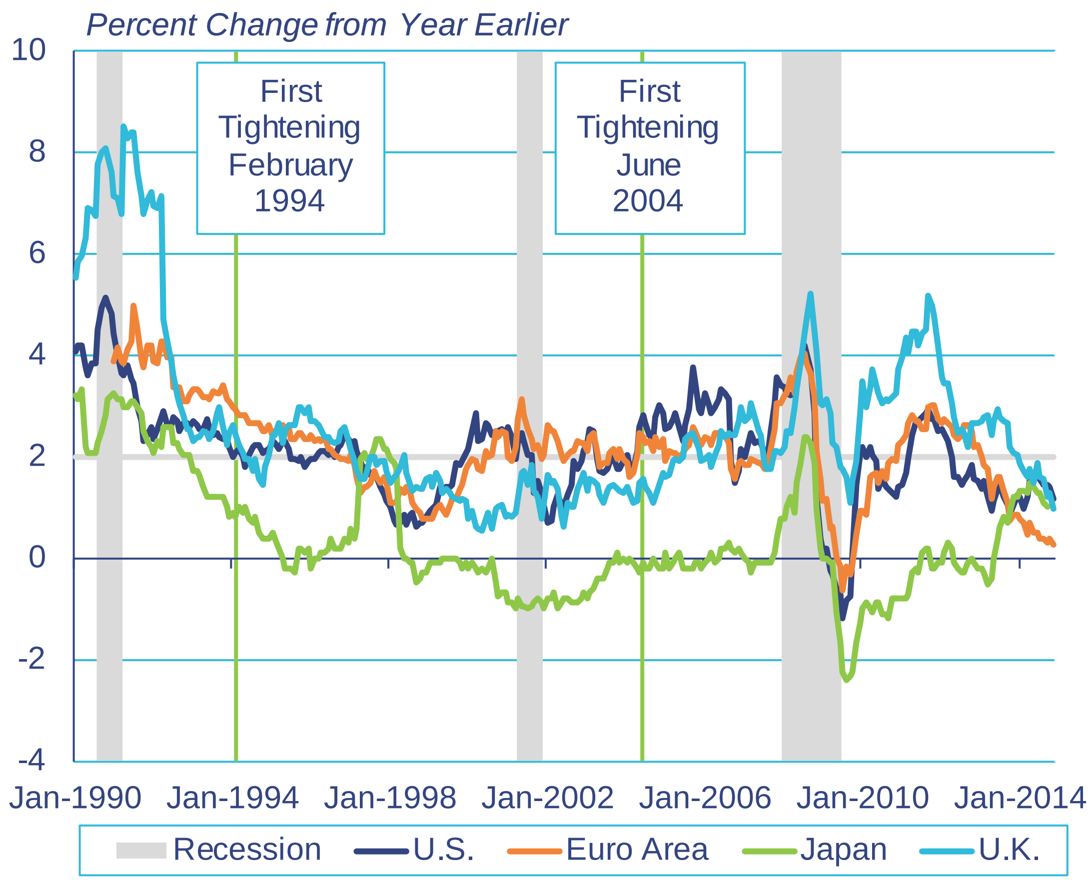
Source: Federal Reserve Board, NBER, Haver Analytics

Complications for Normalization of Monetary Policy This Time

- Unusual to be so far below inflation target – and likely to remain below given the positive supply shock provided by oil
- Unusual for compensation to be so subdued when considering normalization
- Need to normalize an unusually enlarged Fed balance sheet as well as short-term interest rates

Figure 7: Measures of Inflation Targeted by Central Banks

January 1990 - November 2014

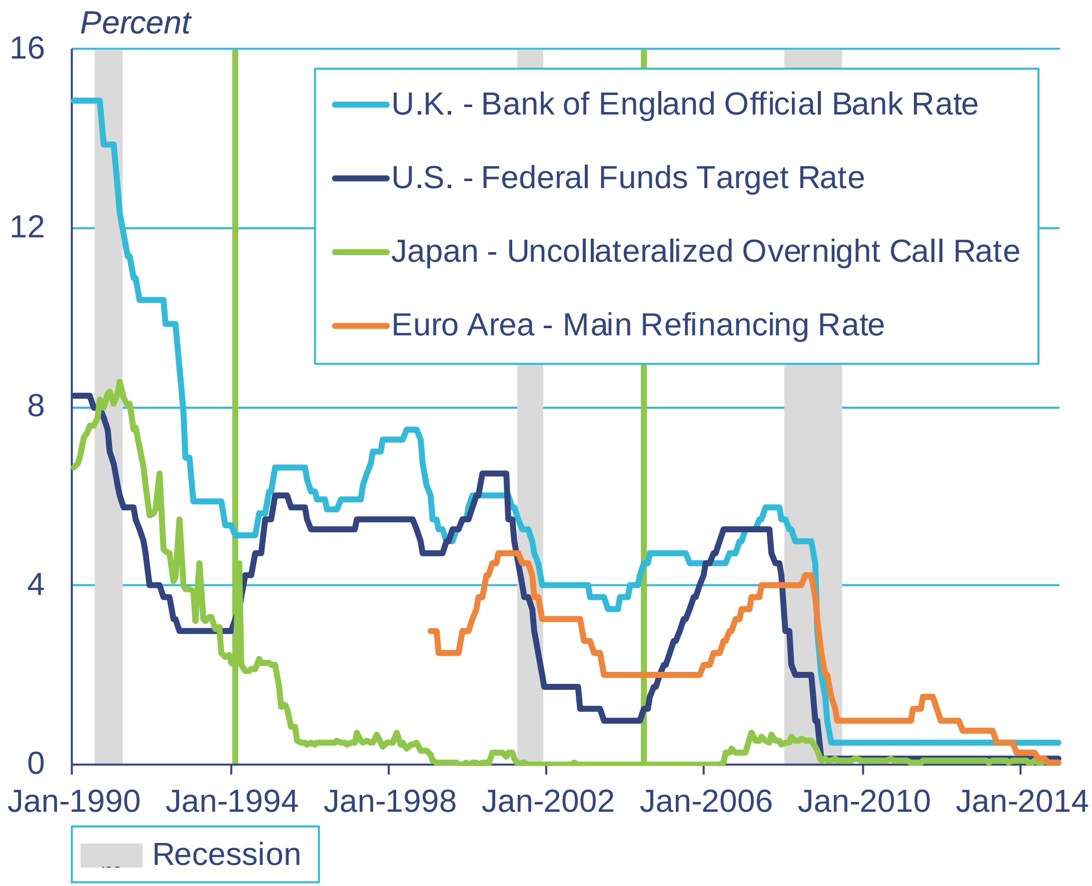


Note: The U.S. series is the PCE. The Euro Area and U.K. series are Harmonized Indices of Consumer Prices. Japan's series is the CPI, All Items less Fresh Food, adjusted for Japan's April 2014 consumption tax increase.

Source: BEA, Eurostat, Japan's Ministry of Internal Affairs and Communications, Bank of Japan, ONS, Haver Analytics

Figure 8: Overnight/Policy Rates for the Euro Area, Japan, the U.K. and the U.S.

January 1990 - December 2014

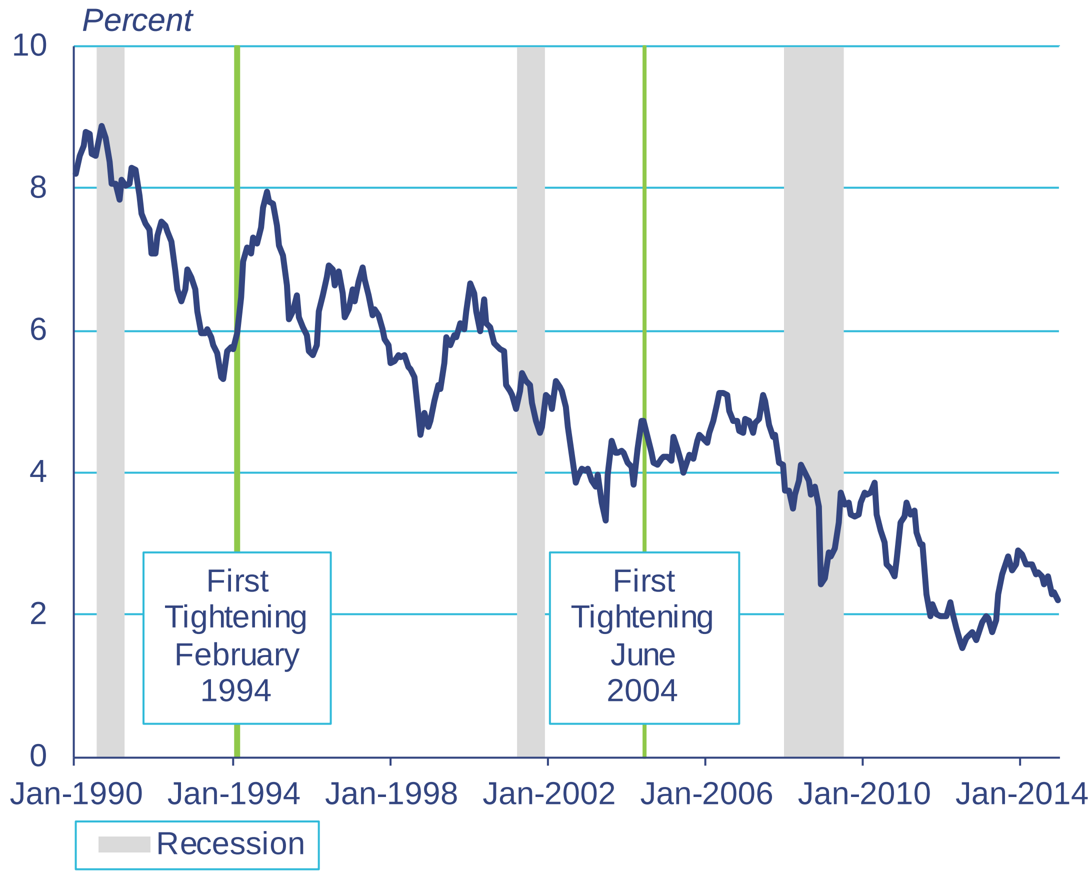


Note: Rates are as of end of period.

Source: European Central Bank, Bank of Japan, Bank of England, Federal Reserve Board, Haver Analytics

Figure 9: Ten-Year U.S. Treasury Yield

January 1990 - December 2014



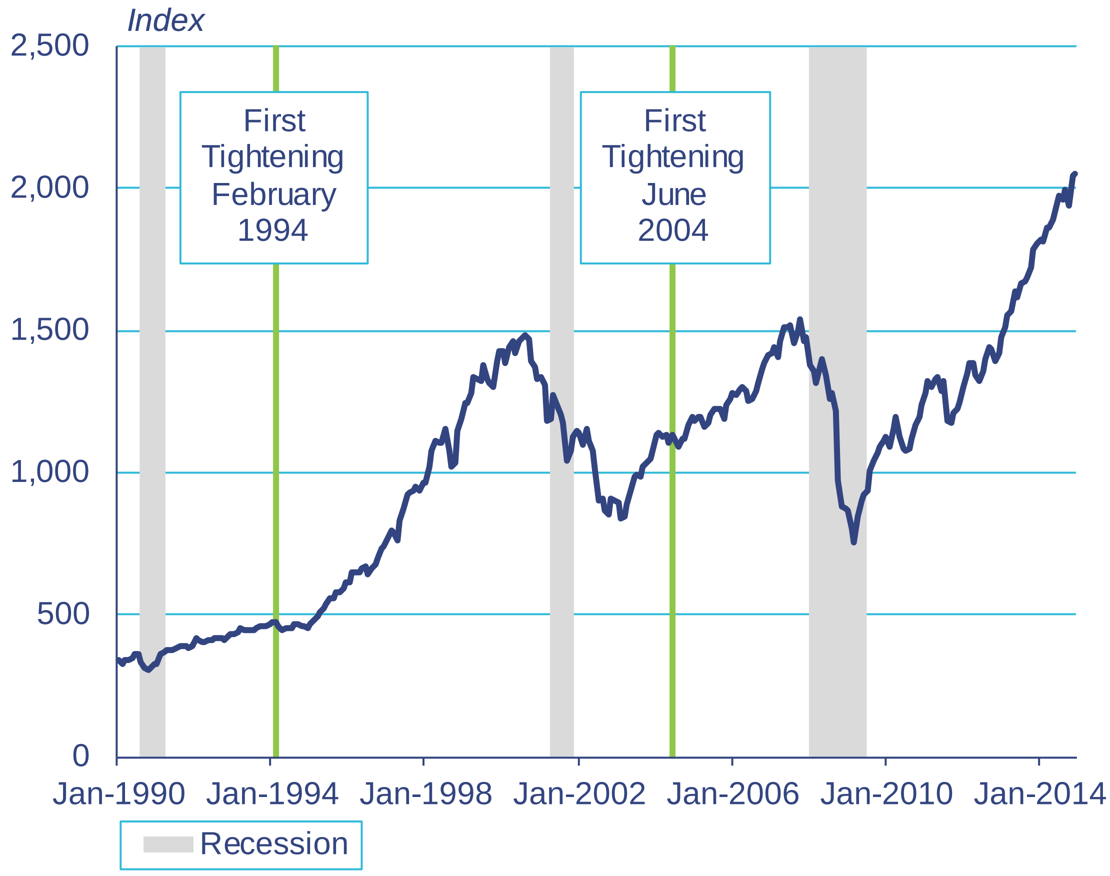
Source: U.S. Treasury, NBER, Haver Analytics

Unusual Factors

- Long-term interest rates are unusually low by historical standards
- Low inflation and large central bank balance sheets have resulted in low long rates in many developed countries compared to historical averages
- A 10-year U.S. Treasury rate around 2 percent seems low assuming a 2 percent inflation rate – a negative real after tax return for 10 years
- Thus some adjustment in long-term rates seems likely during normalization

Figure 10: S&P 500 Composite Stock Price Index

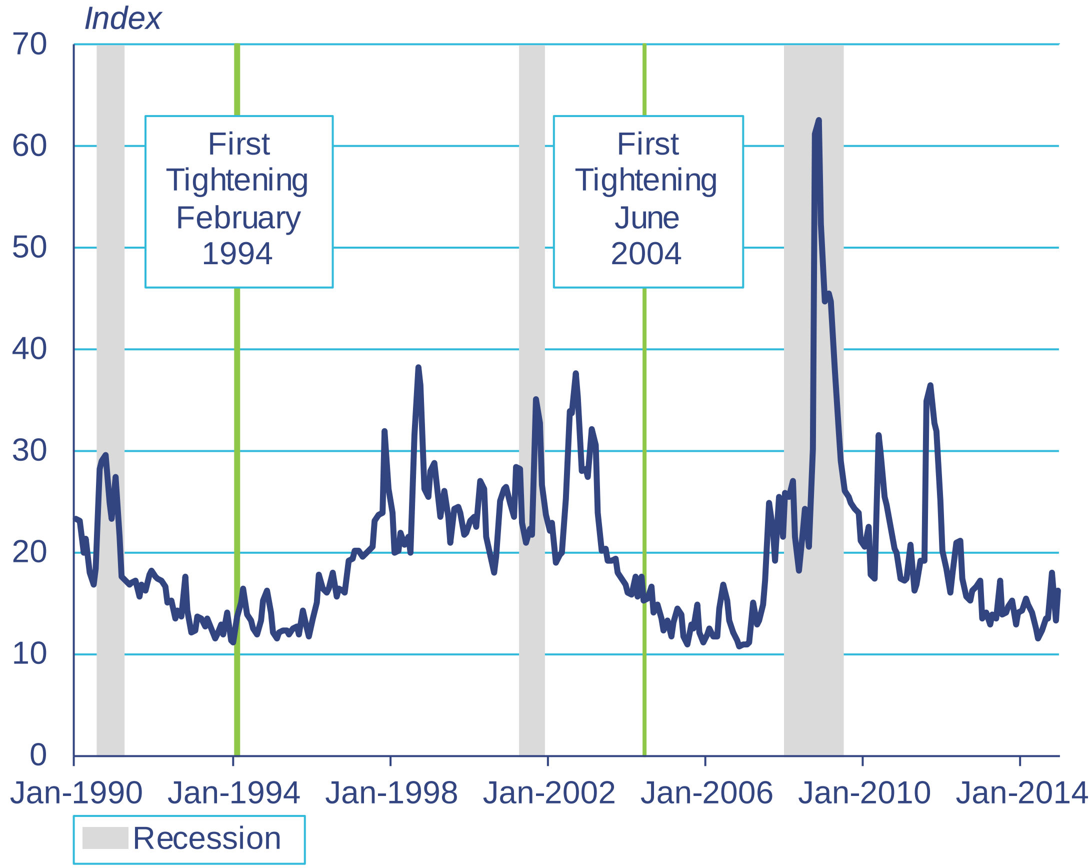
January 1990 - December 2014



Source: S&P, NBER, Haver Analytics

Figure 11: CBOE Market Volatility Index (VIX)

January 1990 - December 2014



Source: CBOE, WSJ, NBER, Haver Analytics

Unusual Conditions Complicate Normalization of Rates

- Short-term and long-term rates are unusually low by historical standards – here and abroad
- Central bank balance sheets are large here and in many other developed economies
- Different inflation experiences will cause divergence in monetary policy
  - Low inflation countries will continue to ease
  - Countries near their inflation target will begin to tighten
- In sum, more complexity than 1994 and 2004, but discussion of policy normalization is a welcome change

Reasons for Some Optimism

- Past two tightening cycles have had low stock price volatility
- Low inflation in most developed countries will allow tightening cycle to be more patient
- Low wages and productivity may imply that interest rates do not return to pre-crisis levels
- More transparent monetary policy communication may reduce uncertainty
- While normalization will be complicated, it is welcome that normalization discussions are now appropriate