Recent Inflation Developments and Challenges for Research and Monetary Policymaking

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* The views expressed here are my own and not necessarily those of the Federal Reserve System or my colleagues on the Federal Open Market Committee.
Figure 1. Headline inflation

Source: U.S. Bureau of Economic Analysis, ECB, Eurostat via Haver Analytics
Monthly data: Last obs. March 2016
Figure 2. Core inflation

U.S. PCE price index ex. Food & Energy
Euro area HICP ex. Food & Energy
U.K. CPI ex. Food, Energy, Alcohol & Tobacco

Year-over-year percentage change

Source: U.S. Bureau of Economic Analysis, ECB, and Eurostat via Haver Analytics
Monthly data: Last obs. March 2016
Figure 3. Other measures of underlying inflation in the U.S.

Source: Federal Reserve Bank of Cleveland and Federal Reserve Bank of Dallas via Haver Analytics
Monthly data: Last obs. March 2016
Figure 4. Trend inflation estimates

Source: Federal Reserve Bank of Cleveland
Quarterly data: Last obs. 2015Q4
Figure 5. Longer-term inflation expectations: Surveys of professional forecasters

Source: Federal Reserve Bank of Philadelphia via Haver Analytics, ECB, Bank of England
Quarterly data: Last obs. 2016Q1
Figure 6. Longer-term inflation expectations: Surveys of households

Source: University of Michigan, Bank of England/GfK
Quarterly data for U.K.: Last obs. 2016Q1
Figure 7. Five-year, five-year forward inflation compensation based on swaps

Source: Bloomberg
Monthly data: Last obs. March 2016
Figure 8. Ten-year inflation risk premia

Source: FRB Cleveland and FRB San Francisco
Monthly data for FRB Cleveland: Last obs. April 2016
Daily data for FRB San Francisco: Last obs. April 7, 2016
Figure 9. Five-year, five-year forward inflation expectations

Source: FRB Cleveland and FRB San Francisco
Monthly data for FRB Cleveland: Last obs. April 2016
Daily data for FRB San Francisco: Last obs. April 19, 2016
Figure 10. The Phillips curve models

- The traditional Phillips curve
  \[ \pi_t = -\gamma u_t + \epsilon_t \]

- The expectations-augmented Phillips curve
  \[ \pi_t = \beta E_t(\pi_{t+1}) - \gamma(u_t - u^*) + \epsilon_t \]

- The New Keynesian Phillips curve
  \[ \pi_t = \beta E_t(\pi_{t+1}) + \lambda mc_t + \epsilon_t \]
  \[ = \beta E_t(\pi_{t+1}) + \kappa(y_t - y_t^{efficient}) + \epsilon_t \]
Figure 11. Confidence intervals around inflation forecasts


ECB Staff Projection, March 2016
Figure 12. FOMC’s Summary of Economic Projections: PCE Inflation

Source: FOMC Summary of Economic Projections, March 2016
Figure 13. Actual and expected inflation in Japan

Note: The data for the 5-year price change and for the 12-month price change are monthly; the Consensus Forecasts data, which are plotted starting in April 1991, are semiannual through April 2014 and quarterly thereafter.

Source: Ministry of Internal Affairs and Communications (Japan); Consensus Economics (London); Haver Analytics.

Source: Janet L. Yellen, “Inflation Dynamics and Monetary Policy,” The Philip Gamble Memorial Lecture, University of Massachusetts, Amherst, MA, September 24, 2015
Figure 14. Research on inflation expectations

- Inflation expectations formation
  - Do inflation expectations lead or lag inflation?
  - Inflation expectations of firms vs. households, vs. professional forecasters

- Firms’ pricing behavior
  - Micro data
  - Financial constraints

- Multiple equilibria

- Learning models