

For release on delivery
9:00 a.m. EST
November 14, 2019

The Federal Reserve's Review of Its Monetary Policy Strategy,
Tools, and Communication Practices

Remarks by

Richard H. Clarida

Vice Chair

Board of Governors of the Federal Reserve System

at

"Fed Policy: A Shadow Review"
Cato Institute's 37th Annual Monetary Conference

Washington, D.C.

November 14, 2019

I am delighted to be at the Cato Institute today to participate in your annual monetary conference. The last time I had the privilege of speaking at this conference was in 2004. This year’s conference, “Fed Policy: A Shadow Review,” takes up the Federal Reserve’s 2019 review of our monetary policy strategy, tools, and communication practices. This topic is, of course, timely and one to which I and others have devoted much thought over the past year.¹

Motivation for the Review

Although I will have more to say about the review in a moment, let me state at the outset that we believe our existing framework, which has been in place since 2012, has served us well and has enabled us to achieve and sustain our statutorily assigned goals of maximum employment and price stability. However, we also believe now is a good time to step back and assess whether, and in what possible ways, we can refine our strategy, tools, and communication practices to achieve and maintain our goals as consistently and robustly as possible.²

With the U.S. economy operating at or close to maximum employment and price stability, now is an especially opportune time to conduct this review. The unemployment rate is near a 50-year low, and inflation is running close to our 2 percent objective. With this review, we hope to ensure that we are well positioned to continue to meet our statutory goals in coming years.

¹ These remarks represent my own views, which do not necessarily represent those of the Federal Reserve Board or the Federal Open Market Committee.

² Fuhrer and others (2018) explore the desirability of comprehensive reviews of the monetary policy framework. They argue that such reviews may help the Fed more effectively identify and implement needed changes to its framework.

The U.S. and foreign economies have changed in some important ways since the Global Financial Crisis. Perhaps most significantly, neutral interest rates appear to have fallen in the United States.³ A fall in neutral rates increases the likelihood that a central bank's policy rate will hit its effective lower bound (ELB) in future economic downturns. That development, in turn, could make it more difficult during downturns for monetary policy to support spending and employment and to keep inflation from falling too far below the central bank's objective—2 percent in the case of the Federal Reserve.⁴

Another key development in recent decades is that price inflation appears less responsive to resource slack. That is, the short-run price Phillips curve—if not the wage Phillips curve—appears to have flattened, implying a change in the dynamic relationship between inflation and employment.⁵ A flatter Phillips curve permits the Federal Reserve to support employment more aggressively during downturns—as was the case during and after the Great Recession—because a sustained inflation breakout is less likely when the Phillips curve is flatter.⁶ However, a flatter Phillips curve also increases the cost, in terms of lost economic output, of reversing unwelcome increases in longer-run inflation

³ For evidence of a fall in neutral rates of interest in the United States and abroad, see, among several contributions, King and Low (2014); Holston, Laubach, and Williams (2017); Rachel and Smith (2017); and Brand, Bielecki, and Penalver (2018).

⁴ For assessments of the risks that U.S. monetary policy will be constrained by the ELB and its implications for economic activity and inflation, see Kiley and Roberts (2017), Erceg and others (2018), Swanson (2018), and Chung and others (2019).

⁵ For evidence of a flattening of the slope of the Phillips curve in the United States and abroad, see, among others, Simon, Matheson, and Sandri (2013); Blanchard, Cerutti, and Summers (2015); and Bank for International Settlements (2017).

⁶ One potential contributor to the flattening of the Phillips curve is a change in the conduct of monetary policy since the 1980s toward greater stabilization of inflation and economic activity; for evidence of such a change, see Clarida, Galí, and Gertler (2000); Boivin and Giannoni (2006); and Boivin, Kiley, and Mishkin (2010). As discussed in Roberts (2006) and Bullard (2018), greater stabilization on the part of a central bank can lead to the estimation of flatter Phillips curves in reduced-form regressions. Similarly, the adoption of an explicit inflation objective, along with greater certainty regarding the conduct of monetary policy, can help anchor longer-term inflation expectations and stabilize actual inflation in response to shocks.

expectations. Thus, a flatter Phillips curve makes it all the more important that inflation expectations remain anchored at levels consistent with our 2 percent inflation objective.⁷ Based on the evidence I have reviewed, I judge that U.S. inflation expectations today do reside at the low end of a range I consider consistent with our price-stability mandate.

A Robust U.S. Labor Market

For some time now, price stability in the United States has coincided with a historically low unemployment rate. This low unemployment rate, 3.6 percent in October, has been interpreted by many as suggesting that the labor market is currently operating beyond full employment. However, we cannot directly observe the level of the unemployment rate that is consistent with full employment and price stability, u^* , but must infer it from data via models. I myself believe that the range of plausible estimates of u^* extends to 4 percent and below and includes the current unemployment rate of 3.6 percent. As the unemployment rate has declined in recent years, labor force participation for people in their prime working years has increased significantly, with the October participation rate at a cycle high of 82.8 percent.⁸ Increased prime-age participation has provided employers with additional labor resources and has been one factor, along with a pickup in labor productivity, restraining inflationary pressures.

⁷ See Yellen (2015) for a discussion of inflation dynamics and monetary policy; see Erceg and others (2018) for a quantitative exploration of the monetary policy implications of a flat Phillips curve in an uncertain economic environment. Since the mid-1980s, movements in both realized inflation and measures of longer-term inflation expectations have been somewhat muted, complicating the task of extracting the precise role of inflation expectations as a determinant of realized inflation. Faust and Wright (2013) review the literature on inflation forecasting and present evidence in support of the conclusion that measures of inflation expectations help predict the trend in inflation. Cecchetti and others (2017) showed that while the level of realized inflation and four-quarter-ahead inflation expectations are positively correlated, changes in these variables have been largely uncorrelated since the mid-1980s. These authors suggest that, in a low and stable inflation environment, policymakers should pay attention to a wide array of other indicators in determining the implications of movements in realized inflation and measures of inflation expectations.

⁸ The box “The Labor Force Participation Rate for Prime-Age Individuals” in the Board’s July 2018 *Monetary Policy Report* contains a discussion of recent developments in labor force participation rates for prime-age individuals; see Board of Governors (2018, pp. 8–10).

Whether participation will continue to increase in a tight labor market remains to be seen. But I note that male prime-age participation still remains below levels seen in previous business cycle expansions.

Also, although the labor market is robust, there is no evidence that rising wages are putting excessive upward pressure on price inflation. Wages today are increasing broadly in line with productivity growth and underlying inflation. Also of note, and receiving less attention than it deserves, is the material increase in labor's share of national income that has occurred in recent years as the labor market has tightened. As I have written before, labor's share tends to rise as expansions endure and the labor market tightens.⁹ In recent cycles—and thus far in this cycle—this rise in labor's share has not put excessive upward pressure on price inflation.

Scope of the Review

The Federal Reserve Act instructs the Fed to conduct monetary policy “so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.”¹⁰ Our review this year takes this statutory mandate as given and also takes as given that inflation at a rate of 2 percent is most consistent over the longer run with the congressional mandate.

⁹ See Clarida (2016).

¹⁰ Even though the act lists three distinct goals, the Federal Reserve's mandate for monetary policy is commonly known as the “dual mandate.” The reason is that an economy in which people who want to work either have a job or are likely to find one fairly quickly and in which the price level (meaning a broad measure of the price of goods and services purchased by consumers) is stable creates the conditions needed for interest rates to settle at moderate levels. For a discussion, see Mishkin (2007). Quoted text from the Federal Reserve Act is in 12 U.S.C. § 225a (2000), <https://www.federalreserve.gov/aboutthefed/section2a.htm>.

Our existing monetary policy strategy is laid out in the Committee’s Statement on Longer-Run Goals and Monetary Policy Strategy.¹¹ First adopted in January 2012, the statement indicates that the Committee seeks to mitigate deviations of inflation from 2 percent and deviations of employment from assessments of its maximum level. In doing so, the Federal Open Market Committee (FOMC) recognizes that these assessments of maximum employment are necessarily uncertain and subject to revision.

As a practical matter, our current strategy shares many elements with the policy framework known as “flexible inflation targeting.”¹² However, the Fed’s mandate is much more explicit about the role of employment than that of most flexible inflation-targeting central banks, and our statement reflects this by stating that when the two sides of the mandate are in conflict, neither one takes precedence over the other.

The review of our current framework is wide ranging, and we are not prejudging where it will take us, but events of the past decade highlight three broad questions that we will seek to answer with our review.

Three Questions

The first question is, “Can the Federal Reserve best meet its statutory objectives with its existing monetary policy strategy, or should it consider strategies that aim to reverse past misses of the inflation objective?”

Under our current approach as well as the approaches of many central banks around the world, persistent inflation shortfalls of the target are treated as “bygones.” Central banks are generally believed to have effective tools for preventing persistent

¹¹ The statement is available on the Board’s website at https://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf.

¹² For a discussion of this terminology and references, see English, López-Salido, and Tetlow (2015) and Clinton and others (2015).

inflation overshoots, but the ELB on interest rates makes persistent undershoots more of a challenge. Persistent inflation shortfalls carry the risk that longer-term inflation expectations become anchored below the stated inflation goal.¹³

In part because of that concern, some economists have advocated “makeup” strategies under which policymakers seek to undo past inflation deviations from target. These strategies include targeting average inflation and price-level targeting, in which policymakers seek to stabilize the price level around a constant growth path.¹⁴ Other makeup strategies seek to reverse shortfalls in policy accommodation at the ELB by keeping the policy rate lower for longer than otherwise would be the case.¹⁵ In many models that incorporate the ELB, these makeup strategies lead to better average performance on both legs of the dual mandate.¹⁶

¹³ These risks could be exacerbated if households and businesses expect monetary policy to be insufficiently accommodative because of proximity to the ELB. For related discussions, see Reifschneider and Williams (2000); Adam and Billi (2007); Nakov (2008); and Hills, Nakata, and Schmidt (2016).

¹⁴ Eggertsson and Woodford (2003) provide an early discussion of how optimal monetary policy at the ELB entails a commitment to reflate the price level during the subsequent economic expansion. Nessén and Vestin (2005) discuss the relationship between average inflation targeting and price-level targeting. There is a dearth of empirical evidence on strategies seeking to make up for inflation deviations. Central banks that pursue an inflation goal generally seek to achieve a specific rate of inflation by some time horizon—typically a couple of years ahead or over the “medium run”—without regard to past inflation deviations. One exception is the Reserve Bank of Australia, whose inflation goal is specified as a range of “2–3 per cent, on average, over the medium term” and thus might embed some notion of history dependence. However, Ruge-Murcia (2014) argues that the drift in the price level in Australia is comparable with the drifts observed in economies with purely forward-looking specification of the inflation goal. The only known historical example of price-level targeting occurred in Sweden from 1931 to 1933 when the country abandoned the gold standard and attempted instead to maintain its price level. The temporary adoption of price-level targeting is credited with helping Sweden avoid deflation, an outcome that contrasted with that in countries that stayed on the gold standard. See Berg and Jonung (1999).

See Bernanke (2017) for a discussion of a temporary price-level targeting strategy. See Hebden and López-Salido (2018) for a quantitative assessment of that and other strategies. See also Kiley and Roberts (2017) for a strategy in which policymakers aim for inflation higher than 2 percent during economic expansions to compensate for below-target realizations of inflation during economic downturns.

¹⁵ See Reifschneider and Williams (2000) for a strategy in which a central bank following a Taylor rule makes up for shortfalls in policy accommodation during ELB episodes by subsequently keeping the policy rate lower than otherwise. The box “Complexities of Monetary Policy Rules” in the Board’s July 2018 *Monetary Policy Report* contains an application of such a modified rule; see Board of Governors (2018, pp. 37–41).

¹⁶ See English, López-Salido, and Tetlow (2015) for applications of flexible price-level targeting and nominal income-targeting strategies to a quantitative model of the U.S. economy.

The success of makeup strategies relies on households and firms believing in advance that the makeup will, in fact, be delivered when the time comes—for example, that a persistent inflation shortfall will be met by future inflation above 2 percent. As is well known from the research literature, makeup strategies, in general, are not time consistent because when the time comes to push inflation above 2 percent, conditions at that time will not justify that action. Thus, one of the most important questions we seek to answer in our review is whether the Fed could, in practice, attain the benefits of makeup strategies that are possible in theoretical models.

The next question the review is considering is, “Are existing monetary policy tools adequate to achieve and maintain maximum employment and price stability, or should the toolkit be expanded? And, if so, how?” The FOMC’s primary monetary policy tool is its target range for the federal funds rate. In December 2008, the FOMC cut that target to just above zero in response to financial turmoil and deteriorating economic conditions. Because the U.S. economy required additional support after the ELB was reached, the FOMC deployed two additional tools in the years following the crisis: balance sheet policies and forward guidance about the likely path of the federal funds rate.¹⁷

In addition to assessing the efficacy of these existing tools, the review is examining additional tools for easing policy when the ELB is binding. During the crisis and its aftermath, the Federal Reserve considered some of the tools deployed by other

¹⁷ As an illustration of the shortfall in policy support created by a binding ELB during the Global Financial Crisis, the simple policy rules considered in a January 2017 speech by then-Chair Janet Yellen prescribed setting the federal funds rate between negative 1-1/2 and negative 9 percent; see Yellen (2017). In addition to using these two additional monetary policy tools, the Federal Reserve implemented a number of other measures to stabilize the financial system, increase household and business confidence, and more generally support the economic recovery. These supplementary measures included the setting up of several credit facilities and the introduction of stress tests for systemically important financial institutions.

central banks but ultimately found them wanting in the U.S. context. But the review is reassessing the case for these and other tools in light of more recent experience in other countries.

The third question the review is considering is, “How can the FOMC’s communication of its policy framework and implementation be improved?” Our communication practices have evolved considerably since 1994, when the Federal Reserve released the first statement after an FOMC meeting. Over the past decade or so, the FOMC has enhanced its communication both to promote public understanding of its policy goals, strategy, and actions and to foster democratic accountability. These enhancements include the Statement on Longer-Run Goals and Monetary Policy Strategy; postmeeting press conferences; various statements about the principles and strategy guiding the Committee’s normalization of monetary policy following the financial crisis; and quarterly summaries of individual FOMC participants’ economic projections, assessments about the appropriate path of the federal funds rate, and judgments of the uncertainty and balance of risks around their projections.¹⁸

As part of the review, we are assessing the Committee’s current and past communications and additional forms of communication that could be helpful. For example, there might be ways to improve communication about the coordination of policy tools or the interplay between monetary policy and financial stability.

¹⁸ Starting in 1979, the Federal Reserve published a summary of individual economic projections from various Board members, FOMC members, or FOMC participants in the semiannual *Monetary Policy Report*. With the introduction of the Summary of Economic Projections (SEP) in 2007, the FOMC increased the frequency of the releases of policymaker projections, expanded the set of economic variables included, and extended the forecast horizon. Because the SEP includes individual contributions of projections and assessments from all FOMC participants, it captures a broader range of views than those of FOMC members. For a discussion and data, see Bernanke (2007) and Romer (2010).

Activities and Timeline for the Review

Let me turn now to our review process itself.¹⁹ An important piece of this review has been a series of 14 *Fed Listens* events, hosted by the Board and the Reserve Banks from late February until mid-October. We heard from a broad range of interested individuals and groups, including business and labor leaders, community development professionals, and academics. At a research conference at the Federal Reserve Bank of Chicago in early June, we heard from prominent academic economists as well as national and community leaders. Our *Fed Listens* events have provided us with a valuable perspective on the labor market that could not otherwise be gleaned from aggregate statistics; these events have also offered insights into how the monetary levers we pull and push affect communities, credit availability, and small businesses.

Last summer, the FOMC began to assess what we have learned at the *Fed Listens* events and to receive briefings from System staff on topics relevant to the review.²⁰ At our July meeting, FOMC participants agreed that our current framework for monetary policy has served the Committee and the U.S. economy well over the past decade. FOMC participants noted that the Committee's experience with forward guidance and asset purchases has improved its understanding of how these tools operate. As a result, the Committee could proceed more confidently in using these tools in the future if economic circumstances warranted. However, overall, we judged that forward guidance and balance sheet tools, while helpful, did not eliminate the risk of returning to the ELB.

¹⁹ Information about the review and the events associated with it are available on the Board's website at <https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications.htm>.

²⁰ See Board of Governors (2019).

At our September meeting, we discussed makeup strategies in the context of a lower neutral policy interest rate, a reduction in conventional policy space, and a higher likelihood that future economic downturns will involve a return to the ELB. We generally agreed that our current monetary policy framework is flexible enough to allow the Committee to choose the policy actions that best support our dual-mandate objectives in a wide variety of economic circumstances.

Our discussions will continue at future meetings. In particular, we have not yet begun to consider potential changes to communication practices, including the Committee's consensus Statement on Longer-Run Goals and Monetary Policy Strategy. The statement has helped articulate and clarify the Federal Reserve's approach to monetary policy, and we have agreed that any changes we might make to our strategy would likely call for some modification of this consensus statement.

We will continue to report on our discussions in the minutes of our meetings and share our conclusions when we finish the review, likely around the middle of next year.

Concluding Thoughts

The economy is constantly evolving, bringing with it new policy challenges. So it makes sense for us to remain open minded as we assess current practices and consider ideas that could potentially enhance our ability to deliver on the goals the Congress has assigned us. For this reason, my colleagues and I do not want to preempt or to predict our ultimate findings. What I can say is that any refinements or more material changes to our framework that we might make will be aimed solely at enhancing our ability to achieve and sustain our dual-mandate objectives in the world we live in today.

Thank you very much for your time and attention. I trust that today's conference will provide stimulating discussion of issues that are central to our review.

References

- Adam, Klaus, and Roberto M. Billi (2007). “Discretionary Monetary Policy and the Zero Lower Bound on Nominal Interest Rates,” *Journal of Monetary Economics*, vol. 54 (April), pp. 728–52.
- Bank for International Settlements (2017). *87th Annual Report*. Basel, Switzerland: BIS, June, <https://www.bis.org/publ/arpdf/ar2017e.pdf>.
- Berg, Claes, and Lars Jonung (1999). “Pioneering Price Level Targeting: The Swedish Experience 1931–1937,” *Journal of Monetary Economics*, vol. 43 (June), pp. 525–51.
- Bernanke, Ben S. (2007). “Federal Reserve Communications,” speech delivered at the Cato Institute 25th Annual Monetary Conference, Washington, November 14, <https://www.federalreserve.gov/newsevents/speech/bernanke20071114a.htm>.
- (2017). “Temporary Price-Level Targeting: An Alternative Framework for Monetary Policy,” *Ben Bernanke’s Blog*, October 12, <https://www.brookings.edu/blog/ben-bernanke/2017/10/12/temporary-price-level-targeting-an-alternative-framework-for-monetary-policy>.
- Blanchard, Olivier, Eugenio Cerutti, and Lawrence Summers (2015). “Inflation and Activity—Two Explorations and their Monetary Policy Implications,” IMF Working Paper WP/5/230. Washington: International Monetary Fund, November, <https://www.imf.org/external/pubs/ft/wp/2015/wp15230.pdf>.
- Board of Governors of the Federal Reserve System (2018). *Monetary Policy Report*. Washington: Board of Governors, July, <https://www.federalreserve.gov/monetarypolicy/2018-07-mpr-summary.htm>.
- (2019). “Minutes of the Federal Open Market Committee, July 30–31, 2019,” press release, August 21, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20190821a.htm>.
- Boivin, Jean, and Marc P. Giannoni (2006). “Has Monetary Policy Become More Effective?” *Review of Economics and Statistics*, vol. 88 (August), pp. 445–62.
- Boivin, Jean, Michael T. Kiley, and Frederic S. Mishkin (2010). “How Has the Monetary Transmission Mechanism Evolved over Time?” in Benjamin M. Friedman and Michael Woodford, eds., *Handbook of Monetary Economics*, vol. 3. Amsterdam: Elsevier, pp. 369–422.
- Brand, Claus, Marcin Bielecki, and Adrian Penalver (2018). “The Natural Rate of Interest: Estimates, Drivers, and Challenges to Monetary Policy,” Occasional Paper Series 217. Frankfurt: European Central Bank, December, <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op217.en.pdf?57d8cac4d66960cceb5c2a59dd46cd>.

- Bullard, James (2018). “The Case of the Disappearing Phillips Curve,” speech delivered at the 2018 ECB Forum on Central Banking, Sintra, Portugal, June 19, https://www.stlouisfed.org/%7e/media/files/pdfs/bullard/remarks/2018/bullard_ec_b_sintra_june_19_2018.pdf?la=en.
- Cecchetti, Stephen G., Michael E. Feroli, Peter Hooper, Anil K. Kashyap, and Kermit L. Schoenholtz (2017). *Deflating Inflation Expectations: The Implications of Inflation’s Simple Dynamics*, report prepared for the 2017 U.S. Monetary Policy Forum, sponsored by the Initiative on Global Markets at the University of Chicago Booth School of Business, held in New York, March 3, <https://research.chicagobooth.edu/%7E/media/806fc2ded9644b5da99518d2b07cc637.pdf>.
- Chung, Hess, Etienne Gagnon, Taisuke Nakata, Matthias Paustian, Bernd Schlusche, James Trevino, Diego Vilán, and Wei Zheng (2019). “Monetary Policy Options at the Effective Lower Bound: Assessing the Federal Reserve’s Current Policy Toolkit,” Finance and Economics Discussion Series 2019-003. Washington: Board of Governors of the Federal Reserve System, January, <https://dx.doi.org/10.17016/FEDS.2019.003>.
- Clarida, Richard H. (2016). “Good News for the Fed,” *International Economy*, Spring, pp. 44–45 and 75–76.
- Clarida, Richard, Jordi Galí, and Mark Gertler (2000). “Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory,” *Quarterly Journal of Economics*, vol. 115 (February), pp. 147–80.
- Clinton, Kevin, Charles Freedman, Michel Juillard, Ondra Kamenik, Douglas Laxton, and Hou Wang (2015). “Inflation-Forecast Targeting: Applying the Principle of Transparency,” IMF Working Paper WP/15/132. Washington: International Monetary Fund, June, <https://www.imf.org/external/pubs/ft/wp/2015/wp15132.pdf>.
- Eggertsson, Gauti B., and Michael Woodford (2003). “The Zero Bound on Interest Rates and Optimal Monetary Policy,” *Brookings Papers on Economic Activity*, no. 1, pp. 139–235, https://www.brookings.edu/wp-content/uploads/2003/01/2003a_bpea_eggertsson.pdf.
- English, William B., David López-Salido, and Robert Tetlow (2015). “The Federal Reserve’s Framework for Monetary Policy: Recent Changes and New Questions,” *IMF Economic Review*, vol. 63 (May), pp. 22–70.
- Erceg, Christopher, James Hebden, Michael Kiley, David López-Salido, and Robert Tetlow (2018). “Some Implications of Uncertainty and Misperception for Monetary Policy,” Finance and Economics Discussion Series 2018-059. Washington: Board of Governors of the Federal Reserve System, August, <https://dx.doi.org/10.17016/FEDS.2018.059>.

- Faust, Jon, and Jonathan H. Wright (2013). “Forecasting Inflation,” in Graham Elliott, Clive Grander, and Allan Timmermann, eds., *Handbook of Economic Forecasting*, vol. 2A. Amsterdam: Elsevier, pp. 2–56.
- Fuhrer, Jeffrey, Giovanni Olivei, Eric Rosengren, and Geoffrey Tootell (2018). “Should the Fed Regularly Evaluate Its Monetary Policy Framework? (PDF)” paper presented at the Brookings Papers on Economic Activity Conference, Fall, held at the Brookings Institution, Washington, September 13–14, https://www.brookings.edu/wp-content/uploads/2018/09/BPEA_Fall2018_Should-the-Fed-Regularly-Evaluate-its-Monetary-Policy-Framework.pdf.
- Hebden, James, and David López-Salido (2018). “From Taylor’s Rule to Bernanke’s Temporary Price Level Targeting,” Finance and Economics Discussion Series 2018-051. Washington: Board of Governors of the Federal Reserve System, July, <https://dx.doi.org/10.17016/FEDS.2018.051>.
- Hills, Timothy S., Taisuke Nakata, and Sebastian Schmidt (2016). “The Risky Steady State and the Interest Rate Lower Bound,” Finance and Economics Discussion Series 2016-009. Washington: Board of Governors of the Federal Reserve System, January, <https://dx.doi.org/10.17016/FEDS.2016.009>.
- Holston, Kathryn, Thomas Laubach, and John C. Williams (2017). “Measuring the Natural Rate of Interest: International Trends and Determinants,” *Journal of International Economics*, vol. 108, Supplement 1 (May), pp. S59–75.
- Kiley, Michael T., and John M. Roberts (2017). “Monetary Policy in a Low Interest Rate World,” *Brookings Papers on Economic Activity*, Spring, pp. 317–96, <https://www.brookings.edu/wp-content/uploads/2017/08/kileytextsp17bpea.pdf>.
- King, Mervyn, and David Low (2014). “Measuring the ‘World’ Real Interest Rate,” NBER Working Paper Series 19887. Cambridge, Mass.: National Bureau of Economic Research, February.
- Mishkin, Frederic S. (2007). “Monetary Policy and the Dual Mandate,” speech delivered at Bridgewater College, Bridgewater, Va., April 10, <https://www.federalreserve.gov/newsevents/speech/mishkin20070410a.htm>.
- Nakov, Anton (2008). “Optimal and Simple Monetary Policy Rules with Zero Floor on the Nominal Interest Rate,” *International Journal of Central Banking*, vol. 4 (June), pp. 73–127, <https://www.ijcb.org/journal/ijcb08q2a3.pdf>.
- Nessén, Marianne, and David Vestin (2005). “Average Inflation Targeting,” *Journal of Money, Credit and Banking*, vol. 37 (October), pp. 837–63.
- Rachel, Lukasz, and Thomas D. Smith (2017). “Are Low Real Interest Rates Here to Stay?” *International Journal of Central Banking*, vol. 13 (September), pp. 1–42, <https://www.ijcb.org/journal/ijcb17q3a1.pdf>.

- Reifschneider, David L., and John C. Williams (2000). “Three Lessons for Monetary Policy in a Low-Inflation Era,” *Journal of Money, Credit and Banking*, vol. 32 (November), pp. 936–66.
- Roberts, John M. (2006). “Monetary Policy and Inflation Dynamics,” *International Journal of Central Banking*, vol. 2 (September), pp. 193–230.
- Romer, David (2010). “A New Data Set on Monetary Policy: The Economic Forecasts of Individual Members of the FOMC,” *Journal of Money, Credit and Banking*, vol. 42 (August), pp. 951–57.
- Ruge-Murcia, Francisco (2014). “Do Inflation-Targeting Central Banks Implicitly Target the Price Level?” *International Journal of Central Banking*, vol. 10 (June), pp. 301–26, <https://www.ijcb.org/journal/ijcb14q2a12.pdf>.
- Simon, John, Troy Matheson, and Damiano Sandri (2013). “The Dog That Didn’t Bark: Has Inflation Been Muzzled or Was it Just Sleeping?” in *World Economic Outlook: Hopes, Realities, Risks*. Washington: International Monetary Fund, April, pp. 79–95, <https://www.imf.org/external/pubs/ft/weo/2013/01/pdf/c3.pdf>.
- Swanson, Eric T. (2018). “The Federal Reserve Is Not Very Constrained by the Lower Bound on Nominal Interest Rates,” NBER Working Paper Series 25123. Cambridge, Mass.: National Bureau of Economic Research, October.
- Yellen, Janet (2015). “Inflation Dynamics and Monetary Policy,” speech delivered at the Philip Gamble Memorial Lecture, University of Massachusetts, Amherst, September 24, <https://www.federalreserve.gov/newsevents/speech/yellen20150924a.htm>.
- (2017). “The Economic Outlook and the Conduct of Monetary Policy,” speech delivered at the Stanford Institute for Economic Policy Research, Stanford University, Stanford, Calif., January 19, <https://www.federalreserve.gov/newsevents/speech/yellen20170119a.htm>.