

For release on delivery  
12:45 p.m. EDT  
September 12, 2018

What Do We Mean by Neutral and What Role Does It Play in Monetary Policy?

Remarks by

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at the

Detroit Economic Club

Detroit, Michigan

September 12, 2018

It is a pleasure to be in Detroit. I started my career working here in the Motor City, and I have followed the fortunes of this area with interest ever since. A few years ago, I visited some of Detroit's neighborhoods with our local officials at a time when damage from the crisis was still pervasive. While challenges remain in many of the city's neighborhoods, since that time the metropolitan area overall has seen signs of a rebound in business activity and investment, and the unemployment rate has continued to trend downward, recently falling to 4.3 percent.<sup>1</sup>

This is similar to the nation's economy more broadly. While challenges remain for many, aggregate growth is strong, and the economy is meeting our full employment and inflation objectives. Given the outlook, it comes as no surprise that the Federal Open Market Committee (FOMC) has been gradually raising interest rates from crisis-era lows and sees further gradual increases as likely to be appropriate in its most recent statement.<sup>2</sup> Before discussing the outlook, it might be useful to first explore some concepts that are important in informing the path of rates.

### **What Is the Neutral Rate of Interest?**

In thinking about how we should set the federal funds rate, many policymakers and economists find the concept of the neutral rate of interest to be a useful frame of reference. So, what does the neutral rate mean? Intuitively, I think of the nominal neutral interest rate as the level of the federal funds rate that keeps output growing around its potential rate in an environment of full employment and stable inflation.<sup>3</sup>

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<sup>1</sup> I am grateful to John Roberts of the Federal Reserve Board for his assistance in preparing this text. These remarks represent my own views, which do not necessarily represent those of the Federal Reserve Board or the Federal Open Market Committee.

<sup>2</sup> See Board of Governors (2018a).

<sup>3</sup> The closely related concept of the natural rate of interest--the rate of interest at which investment and savings are equilibrated at full employment--is originally attributed to Swedish economist Knut Wicksell.

Focusing first on the “shorter-run” neutral rate, this does not stay fixed, but rather fluctuates along with important changes in economic conditions. For instance, legislation that increases the budget deficit through tax cuts and spending increases can be expected to generate tailwinds to domestic demand and thus to push up the shorter-run neutral interest rate. Heightened risk appetite among investors similarly can be expected to push up the shorter-run neutral rate. Conversely, many of the forces that contributed to the financial crisis--such as fear and uncertainty on the part of businesses and households--can be expected to lower the neutral rate of interest, as can declines in foreign demand for U.S. exports.

In many circumstances, monetary policy can help keep the economy on its sustainable path at full employment by adjusting the policy rate to reflect movements in the shorter-run neutral rate. In this context, the appropriate reference for assessing the stance of monetary policy is the gap between the policy rate and the nominal shorter-run neutral rate.

So far, I have been focusing on the shorter-run neutral rate of interest that is responsive to headwinds or tailwinds to demand. The longer-run equilibrium rate is a related concept. The underlying concept of the “longer run” generally refers to the output growing at its longer-run trend, after transitory forces reflecting headwinds or tailwinds have played out, in an environment of full employment and inflation running at the FOMC objective.<sup>4</sup>

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The natural rate and the neutral rate are closely related concepts whose technical differences matter for economic theory and estimation, but less for the intuitive discussion here.

<sup>4</sup> See Brainard (2015).

The longer-run federal funds rate estimated by FOMC participants in their Summary of Economic Projections (SEP) meets the definition of a longer-run equilibrium rate of interest.<sup>5</sup> It is worth highlighting that the longer-run federal funds rate is the only neutral interest rate reported in the FOMC projections. But the shorter-run neutral rate, rather than the longer-run federal funds rate, is the relevant benchmark for assessing the near-term path of monetary policy in the presence of headwinds or tailwinds.

### **Estimating the Neutral Rate of Interest**

Similar to other equilibrium macroeconomic concepts such as potential gross domestic product (GDP) and the natural rate of unemployment, the shorter- and longer-run levels of the neutral rate are not directly observable, so they must be estimated or inferred from the movements of variables that are observed, such as market interest rates, inflation, the unemployment rate, and GDP.<sup>6</sup> In recent years, considerable work has derived estimates of the longer-run equilibrium rate, in some cases using statistical techniques that can be thought of as capturing the highly persistent component of the neutral rate. The central tendency of those estimates suggests that the longer-run trend rate is in the range of 2.5 to 3.5 percent in nominal terms.<sup>7</sup> This range lines up well with the most recent median estimate of the longer-run federal funds rate in the FOMC SEP,

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<sup>5</sup> As defined in the FOMC SEP, “Longer-run projections represent each participant’s assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy.” See the most recent SEP, an addendum to the minutes of the June 2018 FOMC meeting, available in a July 5, 2018, press release on the Board’s website at <https://www.federalreserve.gov/newsevents/pressreleases/monetary20180705a.htm>.

<sup>6</sup> See Powell (2018).

<sup>7</sup> See Kiley (2015); Johansen and Mertens (2016); Holston, Laubach, and Williams (2017); Laubach and Williams (2003) (current estimates available on the Federal Reserve Bank of New York’s website at [https://www.newyorkfed.org/medialibrary/media/research/economists/williams/data/Laubach\\_Williams\\_current\\_estimates.xlsx](https://www.newyorkfed.org/medialibrary/media/research/economists/williams/data/Laubach_Williams_current_estimates.xlsx)); Lewis and Vazquez-Grande (2017); and Lubik and Matthes (2015).

which is just below 3 percent. By these estimates, the longer-run neutral rate has fallen considerably from the estimated range in earlier decades of 4 to 5 percent.<sup>8</sup>

Turning to the shorter-run neutral rate, although the estimates are model dependent and uncertain, we can make some general inferences about its recent evolution that are largely independent of the details of specific models.<sup>9</sup> Estimates suggest the shorter-run neutral rate tends to be cyclical, falling in recessions and rising during expansions, and our current expansion appears to be no exception.<sup>10</sup>

Last year, the unemployment rate returned to pre-crisis levels, which required real interest rates that were below zero for nearly 10 years.<sup>11</sup> This year, the unemployment rate has fallen further, and job market gains have gathered strength, at the same time that the federal funds rate has increased. This combination suggests that the short-run neutral interest rate likely has also increased. If, instead, the neutral rate had remained constant as the federal funds rate increased, we would have expected to see labor market gains slow. That inference is consistent with the formal model estimates, which indicate that the shorter-run neutral rate has gone up as the expansion has advanced. This is also suggested by the observation that overall financial conditions, as measured by a variety of indexes, have remained quite accommodative during a period when the federal funds rate has been moving higher.

In the latest FOMC SEP median path, by the end of next year, the federal funds rate is projected to rise to a level that exceeds the longer-run federal funds rate during a

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<sup>8</sup> A variety of hypotheses have been advanced to explain this decline, including slower labor force growth, slower productivity growth, and an increase in savings propensities. See Kiley (2015) and Brainard (2015).

<sup>9</sup> Estimates of real natural rates of interest based on dynamic stochastic general equilibrium models include Del Negro and others (2015) and Edge, Kiley, and Laforge (2008).

<sup>10</sup> See, for example, Cúrdia (2015) and Del Negro and others (2015).

<sup>11</sup> See Yellen (2015, 2016, 2017).

time when real GDP growth is projected to exceed its longer-run pace and unemployment continues to fall. The shift from headwinds to tailwinds may be expected to push the shorter-run neutral rate above its longer-run trend in the next year or two, just as it fell below the longer-run equilibrium rate following the financial crisis. Notably, the sizable fiscal stimulus in the pipeline is likely to continue to bolster the short-run neutral rate over the next two years. The relatively rich level of current asset valuations relative to historical levels is another factor that could push the short-run neutral rate above its longer-run value. As was noted in the recent FOMC minutes, corporate credit spreads are very narrow, and equity valuations are elevated relative to historical patterns, even after taking into account the low level of interest rates.<sup>12</sup> Business and consumer confidence is high, which is also consistent with a higher shorter-run neutral rate of interest.

### **The Outlook**

Having provided some context for how we might assess policy, I will turn to some observations on the outlook. By any measure, overall growth in the second quarter was strong. Real GDP increased at a 4-1/4 percent annual rate, a very rapid pace nine years into the expansion. Looking ahead, it seems likely that growth will remain solid. Confidence is high, private domestic demand momentum is solid, and recent fiscal stimulus will continue to work its way through the economy, at least for the next year or so.

The labor market is also strong. So far this year, payroll gains have averaged more than 200,000 per month, a step-up from the 2017 pace and well above estimates of the pace necessary to absorb new entrants into the labor force. Among prime-age

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<sup>12</sup> See Board of Governors (2018b).

workers, the employment-to-population ratio is 79.3 percent, up almost 1 percentage point over the past year. These developments are heartening, suggesting the tight labor market is providing employment opportunities to more Americans. Nonetheless, this is still about 1 percentage point below its previous cyclical peak, suggesting there may be some room for further gains.

In another encouraging development, wage gains in the August report reached their highest level since the depth of the financial crisis, although wage growth remains moderate by historical standards. While a variety of wage measures have accelerated over the past year and there is anecdotal evidence of worker shortages in some sectors and regions, there is no evidence of rapid acceleration in the aggregate wage indicators.

At 3.9 percent, the August unemployment rate was about 1/2 percentage point lower than the previous year. If unemployment continues to decline at the same rate as we have seen over the past year, we will soon see unemployment rates not seen since the 1960s. Historically, the few periods when resource utilization has been at similarly tight levels have tended to see elevated risks of either accelerating inflation or financial imbalances.<sup>13</sup> For instance, the inflation process may change in unexpected ways.

So far, the data on inflation remain encouraging, providing little signal of an outbreak of inflation to the upside, on the one hand, and some reassurance that underlying trend inflation may be moving closer to 2 percent, on the other. Core personal consumption expenditures (PCE) prices have increased 2 percent over the past 12 months, consistent with the FOMC's objective. Survey measures of inflation expectations remain stable in the lower end of the historical ranges, while market-based

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<sup>13</sup> See Brainard (2018).

measures of inflation compensation remain stable at levels above the lows seen in 2016. With various measures of underlying trend inflation having come in below our 2 percent objective over a sustained period, it is important to sustainably achieve inflation around 2 percent to prevent an erosion of underlying trend inflation the next time the economy faces a downturn and the federal funds rate hits its lower limit.<sup>14</sup>

The past few times unemployment fell to levels as low as those projected over the next year, signs of overheating showed up in financial-sector imbalances rather than in accelerating inflation. The Federal Reserve's assessment suggests that financial vulnerabilities are building, which might be expected after a long period of economic expansion and very low interest rates. Rising risks are notable in the corporate sector, where low spreads and loosening credit terms are mirrored by rising indebtedness among corporations that could be vulnerable to downgrades in the event of unexpected adverse developments. Leveraged lending is again on the rise; spreads on leveraged loans and the securitized products backed by those loans are low, and the Board's Senior Loan Officer Opinion Survey on Bank Lending Practices suggests that underwriting standards for leveraged loans may be declining to levels not seen since 2005.

While tightening resource utilization and loose financial conditions present upside risks, recent foreign developments present downside risks. Trade policy has introduced uncertainty. Growth in Europe and Japan has moderated from its strong pace of last year, and political risks have reemerged in countries such as Italy. China is contending with deleveraging and deceleration as well as a challenging trade environment. As U.S. growth has pulled away from foreign growth, in part reflecting fiscal policy divergence,

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<sup>14</sup> See Brainard (2017).



expectations of monetary policy divergence strengthened, contributing to upward pressure on the dollar earlier this year. The resulting currency adjustments are compounding challenges faced by some emerging market economies, along with a complicated and unpredictable trade environment and gradually increasing interest rates. Although capital flow reversals have been contained to several notably vulnerable countries so far, I am attentive to the risk that a pullback from emerging markets could broaden.

### **The Path of Policy**

What are the implications for policy? Over the next year or two, barring unexpected developments, continued gradual increases in the federal funds rate are likely to be appropriate to sustain full employment and inflation near its objective. With government stimulus in the pipeline providing tailwinds to demand over the next two years, it appears reasonable to expect the shorter-run neutral rate to rise somewhat higher than the longer-run neutral rate. Further out, the policy path will depend on how the economy evolves.

These developments raise the prospect that, at some point, the Committee's setting of the federal funds rate will exceed current estimates of the longer-run federal funds rate. Indeed, the median projection in the SEP has this property. This raises the possibility of a flattening or inversion of the yield curve in the event that term premiums do not rise from their currently very low levels.<sup>15</sup>

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<sup>15</sup> The standard expectations hypothesis model decomposes longer-term interest rates into a component that represents the influence of expectations of future short-term interest rates and a "term premium." Most estimates of the term premium, which are model-based, suggest that term premiums have been very low recently, and some suggest that term premiums are roughly zero across the yield curve. If term premiums remain low and stable, the component associated with expectations of future short-term interest rates will dominate movements in long-term interest rates.

Like many of you, I am attentive to the historical observation that inversions of the yield curve between the 3-month and 10-year Treasury rates have had a relatively reliable track record of preceding recessions in the United States.<sup>16</sup> But unlike these historical episodes, today the current 10-year yield is very low at around 3 percent, which is well below the average of 6-1/4 percent during the decades before the crisis.

Part of the reason the 10-year Treasury yield is unusually low is that market expectations of interest rates in the longer run are themselves quite low, as discussed earlier. Another important reason the 10-year Treasury yield is very low is that the term premium has fallen to levels that are very low by historical standards. According to one estimate from Federal Reserve staff, the term premium has been slightly negative until very recently and remains very low.<sup>17</sup> By contrast, it was close to 100 basis points when the spread between the 3-month and 10-year Treasury yields was at its peak of 325 basis points in early 2010. This may temper somewhat the conclusions that we can draw from historical yield curve relationships characterized by a substantially higher term premium. If the term premium remains very low, any given amount of monetary policy tightening will lead to an inversion sooner so that even a modest tightening that might not have led to an inversion historically could do so today.

One reason the term premium may be lower than in the past is the changed correlation between stock and bond returns, likely associated with changes in expected inflation outcomes.<sup>18</sup> The other driver of the low level of the term premium globally is

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<sup>16</sup> See Estrella and Mishkin (1997); Johansson and Meldrum (2018); and Favara and others (2016) for more recent analysis.

<sup>17</sup> See Kim and Wright (2005). The latest update is available on the Board's website at <https://www.federalreserve.gov/econresdata/researchdata/feds200533.xls>.

<sup>18</sup> See Chen, Engstrom, and Grishchenko (2016).

the asset purchases of central banks in several major economies.<sup>19</sup> In this case, if the term premium rises as the effect of asset purchase programs diminishes, the effect may be to forestall an inversion of the long-dated yield curve.

It is worth highlighting that the flattening yield curve suggested by the SEP median is associated with a policy path calibrated to sustain full employment and inflation around target. So, while I will keep a close watch on the yield curve as an important signal on financial conditions, I will want to interpret yield curve movements as one of several considerations informing appropriate policy.

Indeed, the possibility that the projected policy path may have unintended consequences is one of the compelling reasons for raising interest rates gradually. The gradual pace of interest rate increases anticipated in the SEP median path should give us some time to assess the effects of our policies as we proceed.

While the information available to us today suggests that a gradual path is appropriate, we would not hesitate to act decisively if circumstances were to change. If, for example, underlying inflation were to move abruptly and unexpectedly higher, it might be appropriate to depart from the gradual path. Stable inflation expectations is one of the key achievements of central banks in the past several decades, and we would defend it vigorously.

## **Conclusion**

Our challenge is to sustain full employment and inflation at 2 percent, which is likely to warrant continued gradual increases in the federal funds rate. With fiscal stimulus in the pipeline and financial conditions supportive of growth, the shorter-run

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<sup>19</sup> See, for example, Li and Wei (2013); Curcuru, De Pooter, and Eckerd (2018); and Curcuru and others (2018).

neutral interest rate is likely to move up somewhat further, and it may well surpass the longer-run equilibrium rate for some period. Beyond the near term, how much the neutral rate is likely to rise and whether it flattens or moderates further out will depend on a variety of developments--such as whether fiscal stimulus is extended or expires, whether foreign and trade risks grow or recede, and whether financial system vulnerabilities extend. As such, the gradual pace of rate increases implicit in the SEP's median policy path incorporates a degree of caution, which is appropriate, in my view.

## References

- Board of Governors of the Federal Reserve System (2018a). “Federal Reserve Issues FOMC Statement,” press release, August 1, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20180801a.htm>.
- (2018b). “Minutes of the Federal Open Market Committee, July 31-August 1, 2018,” press release, August 22, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20180822a.htm>.
- Brainard, Lael (2015). “Normalizing Monetary Policy When the Neutral Interest Rate Is Low,” speech delivered at the Stanford Institute for Economic Policy Research, Stanford, Calif., December 1, <https://www.federalreserve.gov/newsevents/speech/brainard20151201a.htm>.
- (2017). “Understanding the Disconnect between Employment and Inflation with a Low Neutral Rate,” speech delivered at the Economic Club of New York, New York, September 5, <https://www.federalreserve.gov/newsevents/speech/brainard20170905a.htm>.
- (2018). “Navigating Monetary Policy as Headwinds Shift to Tailwinds,” speech delivered at the Money Marketmakers of New York University, New York, March 6, <https://www.federalreserve.gov/newsevents/speech/brainard20180306a.htm>.
- Chen, Andrew, Eric Engstrom, and Olesya Grishchenko (2016). “Has the Inflation Risk Premium Fallen? Is It Now Negative?” FEDS Notes. Washington: Board of Governors of the Federal Reserve System, April 4, <https://www.federalreserve.gov/econresdata/notes/feds-notes/2016/has-the-inflation-risk-premium-fallen-is-it-now-negative-20160404.html>.
- Curcuru, Stephanie E., Michiel De Pooter, and George Eckerd (2018). “Measuring Monetary Policy Spillovers between U.S. and German Bond Yields,” International Finance Discussion Papers 1226. Washington: Board of Governors of the Federal Reserve System, April, <https://www.federalreserve.gov/econres/ifdp/files/ifdp1226.pdf>.
- Curcuru, Stephanie E., Steven B. Kamin, Canlin Li, and Marius Rodriguez (2018). “International Spillovers of Monetary Policy: Conventional Policy vs. Quantitative Easing,” International Finance Discussion Papers 1234. Washington: Board of Governors of the Federal Reserve System, August, <https://www.federalreserve.gov/econres/ifdp/files/ifdp1234.pdf>.
- Cúrdia, Vasco (2015). “Why So Slow? A Gradual Return for Interest Rates,” FRBSF Economic Letter 2015-32. San Francisco: Federal Reserve Bank of San Francisco, October, <https://www.frbsf.org/economic->

[research/publications/economic-letter/2015/october/gradual-return-to-normal-natural-rate-of-interest.](#)

- Del Negro, Marco, Marc Giannoni, Matthew Cocci, Sara Shahanaghi, and Micah Smith. (2015). “Why Are Interest Rates So Low?” *Liberty Street Economics*, Federal Reserve Bank of New York, May 20, <http://libertystreeteconomics.newyorkfed.org/2015/05/why-are-interest-rates-so-low.html/>
- Edge, Rochelle M., Michael T. Kiley, and Jean-Philippe Laforte (2008). “Natural Rate Measures in an Estimated DSGE Model of the U.S. Economy,” *Journal of Economic Dynamics and Control*, vol. 32 (August), pp. 2515-35.
- Estrella, Arturo, and Frederic S. Mishkin (1997). “The Predictive Power of the Term Structure of Interest Rates in Europe and the United States: Implications for the European Central Bank,” *European Economic Review*, vol. 41 (July), pp. 1375-401.
- Favara, Giovanni, Simon Gilchrist, Kurt F. Lewis, and Egon Zakrajšek (2016). “Recession Risk and the Excess Bond Premium,” FEDS Notes. Washington: Board of Governors of the Federal Reserve System, April 8, <https://www.federalreserve.gov/econresdata/notes/feds-notes/2016/recession-risk-and-the-excess-bond-premium-20160408.html>.
- 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 (May), pp. S59-75.
- Johannsen, Benjamin K., and Elmar Mertens (2016). “The Expected Real Interest Rate in the Long Run: Time Series Evidence with the Effective Lower Bound,” FEDS Notes. Washington: Board of Governors of the Federal Reserve System, February 9, <https://www.federalreserve.gov/econresdata/notes/feds-notes/2016/the-expected-real-interest-rate-in-the-long-run-time-series-evidence-with-the-effective-lower-bound-20160209.html>.
- Johansson, Peter, and Andrew Meldrum (2018). “Predicting Recession Probabilities Using the Slope of the Yield Curve,” FEDS Notes. Washington: Board of Governors of the Federal Reserve System, March 1, <https://www.federalreserve.gov/econres/notes/feds-notes/predicting-recession-probabilities-using-the-slope-of-the-yield-curve-20180301.htm>.
- Kiley, Michael T. (2015). “What Can the Data Tell Us about the Equilibrium Real Interest Rate?” Finance and Economics Discussion Series 2015-077. Washington: Board of Governors of the Federal Reserve System, September, <https://www.federalreserve.gov/econresdata/feds/2015/files/2015077pap.pdf>.

- Kim, Don H., and Jonathan H. Wright (2005). "An Arbitrage-Free Three-Factor Term Structure Model and the Recent Behavior of Long-Term Yields and Distant-Horizon Forward Rates," Finance and Economics Discussion Series 2005-33. Washington: Board of Governors of the Federal Reserve System, September (revised December 2011),  
<https://www.federalreserve.gov/pubs/feds/2005/200533/200533pap.pdf>.
- Laubach, Thomas and John C. Williams (2003). "Measuring the Natural Rate of Interest," *Review of Economics and Statistics* 85(4), 1063-1070.
- Lewis, Kurt F., and Francisco Vazquez-Grande (2017). "Measuring the Natural Rate of Interest: A Note on Transitory Shocks," Finance and Economics Discussion Series 2017-059. Washington: Board of Governors of the Federal Reserve System, <https://dx.doi.org/10.17016/FEDS.2017.059r1>.
- Li, Canlin, and Min Wei (2013). "Term Structure Modeling with Supply Factors and the Federal Reserve's Large-Scale Asset Purchase Programs," *International Journal of Central Banking*, vol. 9 (March), pp. 3-39,  
<https://www.ijcb.org/journal/ijcb13q1a1.pdf>.
- Lubik, Thomas A. and Christian Matthes (2015). "Calculating the Natural Rate of Interest: A Comparison of Two Alternative Approaches," Richmond Fed Economic Brief, Federal Reserve Bank of Richmond, Oct, pages 1-6.
- Powell, Jerome H. (2018). "Monetary Policy in a Changing Economy," speech delivered at "Changing Market Structure and Implications for Monetary Policy," a symposium sponsored by the Federal Reserve Bank of Kansas City, held in Jackson Hole, Wyo., August 24,  
<https://www.federalreserve.gov/newsevents/speech/powell20180824a.htm>.
- Wolters Kluwer (2018). *Blue Chip Economic Indicators*, vol. 43 (September 10).
- Yellen, Janet L. (2015). "The Outlook for the Economy," speech delivered to Providence Chamber of Commerce, Providence, Rhode Island, May 22,  
<https://www.federalreserve.gov/newsevents/speech/files/yellen20150522a.pdf>.
- (2016). "The Outlook, Uncertainty, and Monetary Policy," speech delivered to The Economic Club of New York, March 29,  
<https://www.federalreserve.gov/newsevents/speech/yellen20160329a.htm>.
- (2017). "Statement," testimony before the Committee on Banking, Housing, and Urban Affairs, February 14,  
<https://www.federalreserve.gov/newsevents/testimony/files/yellen20170214a.pdf>.