Monetary Mischief and the Debt Trap

Robert Heller

"Monetary mischief" is a situation in which the current stance of monetary policy does not serve the long-term objectives of the nation. In this article, I argue that the Federal Reserve is causing monetary mischief in two ways.

First, the Federal Reserve is mistaken in declaring that 2 percent inflation constitutes price stability. In fact, the cumulative effect of such an inflation rate over time will be very significant and eventually result in a massive erosion of the value of the dollar.

Second, the Fed's long-lasting low interest rate policy, which was implemented through massive purchases of federal debt and mortgage-backed securities, has led the United States toward a "debt trap," in which the debt-to-GDP ratio rises above 100 percent and the interest rate on debt service is greater than the growth rate of GDP. In such a situation, debt service obligations grow more rapidly than the economy; eventually, the accumulated debt can no longer be serviced properly. In other words, the dynamics of the situation become unsustainable and a death spiral ensues.

I short, I believe that the Federal Reserve's policies on inflation and quantitative easing have resulted in severe financial dislocations that will cause future financial and economic instability.

Cato Journal, Vol. 37, No. 2 (Spring/Summer 2017).

Robert Heller is a former member of the Board of Governors of the Federal Reserve System and former president and CEO of VISA U.S.A. He thanks Herbert Grubel, Michael Keran, Frank McCormick, and Steve Stein for helpful comments.

The Fed's Congressional Mandate

It is appropriate to begin any discussion of central bank monetary policy with the mission statement given to the Fed by Congress. According to Section 2A of the Federal Reserve Act, "The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long-run growth of the monetary and credit aggregates commensurate with the economy's long-run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."

While it is somewhat incongruous that the three congressional mandates of maximum employment, stable prices, and moderate long-term interest rates are usually referred to as the "dual mandate," most observers agree that moderate long-term interest rates generally go hand-in-hand with stable prices. Hence, if the goal of price stability is achieved, it is likely that moderate long-term interest rates will also prevail. Consequently, instead of three separate goals, there are really only two independent ones.

But what about the other two objectives: maximum employment and stable prices? Former Fed chairs Paul Volcker and Alan Greenspan often argued that price stability is a precondition for the attainment of maximum growth and employment. Ben Bernanke (2006) also stated that he agreed with "the modern consensus that price stability, besides being desirable in itself, tends also to increase economic growth and stability." In economists' terms, then, price stability is a necessary condition for full employment and maximum economic growth. Price stability should therefore be the overarching goal of the Federal Reserve in its conduct of monetary policy (see Heller 2016: 266–67).

Does 2 Percent Inflation Constitute Price Stability?

During Alan Greenspan's tenure as chairman, the FOMC had a formal deliberation on the appropriate long-term inflation goal. This discussion took place on July 2, 1996; the inflation rate at that time was about 3 percent, as measured by the year-on-year increase in the consumer price index. Then-Governor Janet Yellen led off the debate by suggesting that the FOMC adopt a 2 percent inflation target (Board of Governors 1996: 45).

During that discussion, Chairman Greenspan defined price stability as "that state in which expected changes in the general price level do not effectively alter business or economic decisions." When pressed by Yellen to put a number on that, he replied: "I would say that number is zero, if inflation is properly measured" (ibid.: 51).

The discussion of the FOMC was wide-ranging, and not all participants clearly specified their preference. But if I read the transcript correctly, one-third of the speakers favored a zero percent inflation target—that is, actual price stability—just like Chairman Greenspan. Another third of the FOMC members favored moving as soon as practicable to a 2 percent inflation target. The remaining third wanted to "cap" inflation at the current level of 3 percent but move to a lower inflation rate over time.

Trying to form a consensus, Chairman Greenspan summarized that "we have all now agreed on 2 percent," leaving open the question of what inflation measure to use: the consumer price index, the personal consumption deflator, the GDP deflator, or possibly some other measure of inflation (ibid.: 63).

After concluding the discussion of the 2 percent inflation target, Greenspan cautioned that

> The question really is whether we as an institution can make the unilateral decision to do that . . . I think this is a very fundamental question for this society. We can go up to the Hill and testify in favor of it; we can make speeches and proselytize as much as we want. I think the type of choice is so fundamental to a society that in a democratic society we as unelected officials do not have the right to make that decision [ibid.: 67].

By this, Greenspan questioned whether the Federal Reserve actually had the right to take such an action, and wondered what the possible consequences might be.

The following morning, Greenspan praised the FOMC: "The discussion we had yesterday was exceptionally interesting and important" (ibid.:72). But he also admonished the Committee members: "I will tell you if the 2 percent inflation figure gets out of this room, it is going to create more problems for us than I think any of you might anticipate" (ibid.). Thus, he expressed his grave concern that even an informal inflation target of 2 percent might raise a few Congressional eyebrows, as it might be seen as not being

in full compliance with the mandate for "price stability" as enunciated in the Federal Reserve Act.

Fifteen years later, under Chairman Bernanke, the FOMC announced a formal inflation target of 2 percent. Since then, the FOMC has consistently argued that this 2 percent inflation target conforms with the congressional mandate for price stability.

However, a 2 percent inflation rate means that the price level will double approximately every 35 years. This means that, over a normal lifespan of 70 years, the purchasing power of a dollar will decline to a mere 25 cents. It is highly questionable whether Congress had this in mind when it tasked the Fed with achieving "price stability." Defining 2 percent inflation as price stability may well constitute "monetary mischief" in the eyes of many impartial and fair-minded observers.

Moreover, there is little or no evidence that a 2 percent inflation rate will actually maximize employment or the growth potential of the economy. Some of the current FOMC members argue that 2 percent inflation will reduce the likelihood of undesirable deflation, but offer little evidence that some modest deflation is actually harmful. For instance, most observers probably agree that the modern technology sector is one of the most vibrant sectors of the U.S. economy. But this sector has also been experiencing considerable price decreases for many years without suffering ill consequences as a result.

Some observers, including some members of the FOMC, have argued that the Fed should actually increase its inflation target to as much as 4 percent (see Bernanke 2016). But if 4 percent is better than 2 percent, wouldn't 8 percent inflation be better still? Where does this argument stop? We only have to look at U.S. history—or that of other high inflation countries, such as Venezuela—to see convincing evidence that high inflation will inevitably result in a troubled economy.

A Fixed Inflation Target versus a Target Range

Instead of the fixed 2 percent inflation target, the Fed might have been better off specifying an inflation target range of 0 to 2 percent, with lower inflation rates within that range being preferable.[1]

[1]Indeed, an inflation target range was suggested by several of the participants in the FOMC debate of July 2, 1996. See Board of Governors (1996).

First of all, it is very hard to hit a fixed target like the specified 2 percent inflation target. Such a target also implies that policy will change soon after the threshold is crossed in either direction. Yet given the long and variable lags in monetary policy, such a strategy may introduce additional instability in the policymaking process and in the expectations of market participants. If instead a target range were specified, market participants could expect a steady policy as long as inflation is within the announced range.

Moreover, if the Fed had an inflation target range of 0 to 2 percent, the rationale for holding interest rates at near zero would have disappeared many years ago and the process of interest rate normalization might be completed by now. Such a policy stance would have avoided many of the undesirable and presumably unintended side effects of the unorthodox monetary policy measures that were actually pursued.

The Ineffectiveness of Quantitative Easing

Since 2008, the Fed has engaged in several episodes of unconventional monetary policy—generally referred to as quantitative easing, or QE—that involved massive purchases of U.S. Treasury obligations and mortgage-backed securities (MBS) to stimulate the economy. Most observers agree that, in the period right after the crash of 2008, these asset purchases provided much needed liquidity to financial markets and helped to avoid a market "freeze" or "lock up," which might have precipitated an even deeper recession. This liquidity injection followed the classical prescription of Walter Bagehot (1873), who argued that central banks should lend freely during periods of financial crisis.

While the initial liquidity injection was helpful in returning financial markets to stability, market liquidity was no longer an issue during the following episodes of QE2 and QE3. The first round of QE involved the purchase of over $1.8 trillion of Treasury securities, MBS, and other paper. At the end of QE1 in March 2010, depository institutions were holding about $1.1 trillion in excess reserves at the Fed.[2] The liquidity shortage had clearly ended.

Nevertheless, the Federal Reserve continued its quantitative easing policy. During the second round of QE in 2010–11, the Fed

[2]Figures from FRED Economic Data, Federal Reserve Bank of St. Louis.

bought another $600 billion of Treasury securities. Finally, QE3 involved the open-ended purchase of $40 billion of securities per month, which was later expanded to $85 billion per month. Eventually, the Fed ceased its QE program in October 2014, by which time its balance sheet had increased six-fold—from about $750 billion to $4.5 trillion—and depository institutions had accumulated excess reserves of $2.6 trillion.

Those accumulated assets are still on the books of the Federal Reserve System because, rather than letting maturing securities "roll off," and thereby reduce the size of the Fed's balance sheet, the FOMC has instead chosen to continually roll them over. Consequently, the enormous excess-reserve overhang continues to present a future inflationary danger for the economy.

The obvious question is whether this enormous liquidity injection was effective in increasing economic growth in the United States, as it was intended to do. Sadly, there is strong evidence that QE had little, if any, effect on U.S. economic growth (see Taylor 2014: 62; Thornton 2014; and Fisher 2014). As a matter of fact, the current recovery has averaged less than 2 percent real growth per year, which makes it the slowest on record since the end of World War II.

Not only was the Fed's QE policy ineffective in raising GDP growth, but FOMC members themselves consistently overrated the effectiveness of QE in stimulating future GDP growth rates. In the years since 2008, committee members overestimated the growth rate of GDP for the coming year in 13 out of 14 forecasts made. During the same time period, all of the FOMC's two-year forecasts of GDP growth were too high. In many cases, these forecasts erred by more than 2 percentage points (Hilsenrath 2016, Goolsbee 2016). Comparing the midpoint of the central tendency of the two-year GDP growth forecasts made mid-year by FOMC members during the QE period (2009–13) with the actual GDP growth performance, we find forecast errors of more than 75 percent.[3] This is a rather large forecasting error by any standard.

While FOMC members' growth projections were rather exuberant during the QE period, this optimism was not validated by the

[3]See "Longer-Run FOMC Summary of Economic Projections for the Growth Rate of Real GDP," central tendency, various dates.

subsequent performance of the economy. After QE ended, the growth forecasts of the Committee members became more reasonable and were closer to the economy's actual performance. This shows that the FOMC itself was much too optimistic with regard to the effectiveness of the QE program. We may conclude that the QE experiment was singularly unsuccessful in raising the U.S. economy's growth rate, and that it left the Fed with a bloated balance sheet that will be difficult to unwind. So far, the Federal Reserve has not enunciated any concrete policy on to how it plans to unwind its swollen balance sheet and thereby remove the potential inflationary threat from the economy.

In sum, the QE experiment constitutes enormous "monetary mischief" that the Fed does not know how to undo and that embodies the potential for significant future price inflation.

Similar conclusions were reached in a study by the Bank for International Settlements with respect to the experience of other countries. Borio and Zabai (2016) conclude that, while QE had some influence on interest rates, its impact on GDP was generally only very modest and diminished over time.

The same study points out the increasingly large negative side effects of QE around the world. These include a decline in the profitability of banks, insurance companies, and pension funds. In addition, because of the low or negative returns on many financial instruments, more risk taking in financial markets has ensued.

The Unintended Consequences of Quantitative Easing

Both the growing federal debt and the portion of that debt financed by the Federal Reserve have significant unintended consequences for the U.S. financial system and the economy at large. Essentially, the Federal Reserve monetized via QE a good portion of U.S. federal and mortgage debt; this continues to represent a potential inflationary overhang. As already noted, the Federal Reserve has announced no firm strategy or plans for unwinding its swollen balance sheet.

While the ultimate effect of QE cannot be fully known until it is unwound, we can already discern numerous negative financial and economic consequences attributable to the expansion of the Federal Reserve's balance sheet in pursuit of a low interest rate policy.

Limited Room for Future Policy Stimulus

First, the current low-interest rate level does not allow the Fed to cut interest rates if a new recession appears on the horizon. If the Fed had normalized interest rates a few years ago—after the initial liquidity crisis had passed—short-term rates might now be in the neighborhood of 4 percent. The Fed would then have ample scope to cut rates should a new recession arise. Typically, the Fed cuts interest rates by several hundred basis points at the onset of a recession; clearly, this is not feasible now unless the Fed drives interest rates into negative territory. In other words, the Federal Reserve cannot avail itself of this important and well-established countercyclical monetary policy tool under current circumstances. It has lost its room to maneuver.

Financial Sector Imbalances

Some of the most severe unintended effects of low interest rates can be found in the financial sector, where banks, life insurance companies, and pension funds are experiencing very low earnings. It is important to look at these effects in somewhat greater detail, as they may have a significant impact on the future stability of the financial system.

One of my former professors at the University of California at Berkeley, Hyman Minsky, always warned that "every expansion creates the seeds of its own destruction," and that "stability itself is destabilizing." Economists now talk of a "Minsky moment"—a situation in which "debt levels reach breaking-point and asset prices across the board start plunging" (The Economist 2016a). Given the near-zero interest rate environment of the last eight years, such a Minsky moment may well be approaching.

Banks and similar financial institutions have experienced greatly reduced net interest rate margins due to the artificial flatness of the yield curve. From a high of 4.9 percent at the beginning of 1994, and 3.8 percent in Q1 2010, margins have now declined to a mere 3.0 percent for all U.S. banks.[4]

Traditional maturity transformation is the bread and butter of these institutions, and their ability to earn traditional margins has

[4]Figures from FRED Economic Data, Federal Reserve Bank of St. Louis.

been severely impaired. Higher margins would have incentivized them to increase lending to their customers. This would have stimulated consumption, investment, employment, and economic growth. Improved earnings would have also allowed banks and other financial institutions to increase their capital base more rapidly, thereby enhancing their safety.

The low interest rate environment has also resulted in a virtual cessation in the chartering of new banks. New bank formation has declined from several hundred per year to a mere trickle in the years since the institution of the Fed's low interest rate policy. Only three new banks were chartered in the years 2011–15 (Gruenberg 2016).

Studies by the Federal Reserve have shown that 75 to 80 percent of the decline in new bank formation can be attributed to the low interest rate policy pursued by the Fed (McCord, Prescott, and Sablik 2015; Adams and Gramlich 2016). The market entry of new banks would not only have increased the volume of lending but would also have stimulated competition among an ever shrinking number of banks.

The more stringent and burdensome regulatory environment imposed by the Dodd-Frank Act of 2010 has also had a negative effect on new bank formation. Obviously, it is difficult to clearly disentangle the relative importance of low interest rate policy and contemporaneous regulatory changes, but it is clear that the combined effect has been devastating to the banking industry. Overall, the number of FDIC-insured commercial banks declined by an astounding 27 percent from 7,076 in 2008 to 5,170 in 2016 (FDIC 2016).

Pension funds and life insurance companies are also experiencing the negative impact of the low interest rate environment. In calculating the amounts that they can offer to pay to beneficiaries, many pension funds and life insurance companies still assume that they will earn rather healthy returns on their investment portfolios. For instance, the giant CalPERS pension fund assumes a rate of return on assets of 7.5 percent per year, but earned only a paltry 0.6 percent return for the last fiscal year (2015–16). If these shortfalls persist, CalPERS will have to turn eventually to the taxpayers to make up the difference (CalPERS 2016, Gittelsohn 2016).

According to the Center for Retirement Research at Boston College, the approximately 4,000 state and local pension funds in the United States are 72 percent funded at interest rates of 7 to 7.5 percent. At a 4 percent rate, however, the funding percentage drops to

42 percent. As The Economist (2016b) notes, this implies a collective shortfall in funding of more than $4 trillion.

The situation is even more dire in several European countries as well as in Japan, where returns on governmental obligations are actually negative. By their extreme negative interest rate polices, some foreign central banks have managed to turn income-earning assets into liabilities. According to Whittall and Goldfarb (2016), about $13 trillion worth of debt worldwide now trades at negative interest rates.

When interest rates rise, which they inevitably will, pension funds, life insurance companies, and regular savers will face another problem: the face value of the bonds in their portfolios will decline. This difficulty will be particularly acute for long-dated bonds and will exacerbate the low earnings problem experienced at the present time.

The current low interest rate environment will have boxed all financial institutions holding long-term bonds into a corner: they will be caught in a gigantic debt trap of their own. A powerful "Minsky moment," which will threaten the stability of the financial system as well as the economic security of the population, may soon be upon us.

Income Inequality

Stock market valuations have benefitted substantially from the low-interest rate policies of central banks, as investors chased yield in the stock market. The low-interest environment helped to boost the Dow Jones Index by more than 250 percent since the end of the Great Recession.

During the QE program, the growth rate of the stock market indices tracked closely the growth rate of the Federal Reserve asset purchases. As Warsh (2016) notes, it is telling that more than 50 percent of all the changes in the value of the S&P 500 occurred on days of FOMC meetings.

Obviously, most of the stock market gains driven by QE accrued to people at the upper end of the income and wealth spectrum, as stockholders saw their assets appreciate significantly. At the same time, as the Fed drove interest rates down, bond holders benefitted from the appreciation in the market value in their portfolio.

Given that the wealth distribution in the United States is highly skewed, most of the profits that resulted from the stock and bond market gains accrued to the wealthiest Americans, and thereby

exacerbated the existing income and wealth inequalities. Clearly, this was an unintended consequence of the low interest rate policy of the Fed, but it contributed to the increasingly uneven income and wealth distribution decried by many observers. It may be hoped that a "trickle down" effect will eventually benefit the people at the lower end of the income and wealth distribution as well.

The Federal Debt Trap

As interest rates will inevitably rise in the future, governments at all levels —federal, state, and local—will face a debt trap when interest rates exceed the growth rate of their revenues.

The total federal government debt was $18.1 trillion at the end of 2015. Of this total, $13.1 trillion was held by the public, while the rest was held by the Federal Reserve and other governmental entities. When compared to a 2015 GDP of $17.9 trillion, the gross debt-to-GDP ratio is now over 100 percent. The net debt ratio is 74 percent (Council of Economic Advisers 2016).

Because of the current low interest rate environment, the federal government made net interest payments of "only" $223 billion in 2015, which amounted to a rather modest 1.7 percent of GDP. As nominal GDP growth of 3.7 percent was higher than that, we are still in a situation where the growth in the annual interest paid on the debt is lower than the dollar growth of GDP. That is, we have not yet fully entered the debt trap; the interest-to-GDP ratio is not yet unstable. But the day of reckoning is rapidly approaching.

There are two dangers looming on the horizon, both of which may lead the United States into the debt trap with dynamically increasing debt burdens. First, if the federal budget continues on its currently projected path, the Congressional Budget Office (CBO) estimates that annual federal deficits will increase from about 3 percent to 5 percent of GDP over the coming decade. Under these circumstances, about $10 trillion would be added to the federal debt over the next 10 years (CBO 2016). A higher debt level will result in higher interest payments by the government. Second, as interest rates are normalized, federal interest payments will also increase inexorably.

As a result of these two forces, the CBO projects that over the next decade the ratio of the federal debt held by the public to GDP will reach 86 percent, while the total debt will exceed GDP. The CBO

warns that federal spending on interest payments will increase substantially; productivity and wages will be lower; and the probability of a financial crisis will increase.

Three decades from now, the CBO projects that the debt held by the public will be equal to 155 percent of GDP. That is a level comparable to that of Greece and Portugal at the present time. Just like these countries, the United States will have fully entered the debt trap, where the debt level will inexorably rise, creating an unstable situation. This is the situation that we are perilously close to finding ourselves confronted with.

In this scenario, the government may lose its capacity to borrow and may not be able to fulfill its existing debt service obligations except by printing money—thereby precipitating a highly inflationary spiral. Financial turmoil and an economic crisis may well result. While these problems are difficult to solve from an economic perspective, political consequences may further exacerbate the problems. The broader political and security implications may be calamitous.

What Should Be Done?

What policy actions should be taken now to correct the situation that the United States find itself in? First of all, the Federal Reserve should increase interest rates as rapidly as possible to "normal" levels. This would be appropriate for today's near-full employment situation. It would also give the Fed additional room to maneuver should a new recession confront the country. Feldstein (2016) offers a similar analysis.

Second, the Fed should let Treasury and mortgage-backed securities "roll off" its balance sheet as they mature. This will not upset financial markets and will allow for a gradual reduction in the size of the Fed's balance sheet, thereby helping to lower the amount of excess reserves held by banks.

Third, the Fed should stop paying interest on those excess reserves. Such a shift would give banks an additional incentive to lend out these funds, which was surely the purpose of the reserve expansion in the first place.

Fourth, the federal government should take actions to sharply reduce the federal deficit, just as was done in the late 1990s at the peak of that cyclical expansion. There is no economic theory that

would advocate the running of substantial deficits near the peak of the economic cycle.

The deficit should be reduced by curtailing expenses on both entitlement programs and discretionary spending. In addition, sensible tax reform that simplifies the tax structure and reduces excessively high marginal corporate rates while eliminating loopholes would help to reduce the deficit. Such a policy would also stimulate greater economic growth that would enhance tax revenues. Regulatory reform that eliminates unnecessary restrictions could give an additional impetus to economic growth (O'Keefe 2016).

Conclusion

In this article, I have argued that the Federal Reserve's inflation target of 2 percent is not in conformity with the Congressional mandate for price stability. Furthermore, I have shown that the quantitative easing policies used to implement the Fed's low interest rate policy have been ineffective in raising economic growth. Together, these twin policies have had many unintended consequences that may well precipitate future instability in the financial sector. As such, they offer a good example of the "monetary mischief" that policymakers have engaged in over the last few years. Unless corrective actions are taken soon, the federal government will face a debt trap as it is confronted with increasing deficits and rising interest payments. Entering this debt trap might result in a fiscal and financial crisis of major proportions, which would also have broader economic, political, and security repercussions.

References

Adams, R. M., and Gramlich, J. (2016) "Where Are All the New Banks? The Role of Regulatory Burden in New Bank Formation." *Review of Industrial Organization* 48 (2): 181–208.

Bagehot, W. (1873) *Lombard Street: A Description of the Money Market.* London: Henry S. King and Co.

Bernanke, B. S. (2006) "The Benefits of Price Stability." Speech at the 75th Anniversary of the Woodrow Wilson School of Public and International Affairs, Princeton University (February 24).

_____ (2016) "Modifying the Fed's Policy Framework: Does a Higher Inflation Target Beat Negative Interest Rates?" Brookings Institution (September 13).

Board of Governors of the Federal Reserve System (1996) "Transcripts of the FOMC meeting of July 2." Available at: www.federalreserve.gov/monetarypolicy/files/FOMC19960703meeting.pdf.

Borio, C., and Zabai, A. (2016) "Unconventional Monetary Policies: A Reappraisal." Bank for International Settlements Working Paper No. 570 (July).

CalPERS (2016) "Preliminary 2015-16 Fiscal Year Investment Returns" (July 16).

Congressional Budget Office (2016) "Updated Budget Projections: 2016 to 2026" (March 24).

Council of Economic Advisers (2016) "Economic Report of the President." Available at obamawhitehouse.archives.gov/blog/2016/02/22/2016-economic-report-president.

FDIC (2016) "Statistics at a Glance." Washington: Federal Deposit Insurance Corporation (September).

Feldstein, M. (2016) "Why the Fed Should Raise Rates Now." *Wall Street Journal* (October 7).

Fisher, R. W. (2014) "R.I.P. QE3 . . . Or Will It?" Shadow Open Market Committee (November 3).

Gittelsohn, J. (2016) "Calpers Earns 0.6% as Long-Term Returns Trail Fund's Target." Bloomberg (July 18).

Goolsbee, A. (2016) "On the Fed's Broken Forecasting Model." *Value Walk* (June 27).

Gruenberg, M. J. (2016) "De Novo Banks and Industrial Loan Companies." Statement by the FDIC chairman to the U.S. House of Representatives, Committee on Oversight and Government Reform (July 13).

Heller, R. (2015) *The Unlikely Governor.* Belvedere, Calif.: Maybridge Press.

Hilsenrath, J. (2016) "The Great Unraveling: Years of Fed Missteps Fueled Disillusion with the Economy and Washington." *Wall Street Journal* (August 26).

McCord, R.; Prescott, E. S.; and Sablik, T. (2015) "Explaining the Decline in the Number of Banks since the Great Recession." Federal Reserve Bank of Richmond *Economic Brief* (March).

O'Keefe, B. (2016) "The Red Tape Conundrum." *Fortune* (November 1).

Taylor, J. (2014) "The Role of Policy in the Great Recession and the Weak Recovery." *American Economic Review: Papers and Proceedings* 104 (5): 61–66.

The Economist (2016a) "Minsky's Moment." *The Economist* (July 30).

_____ (2016b) "The Low-Rate World." *The Economist* (September 24).

Thornton, D. L. (2014) "Has QE Been Effective?" Federal Reserve Bank of St. Louis *Economic Synopses* No. 32014 (February 10).

Warsh, K. (2016) "The Federal Reserve Needs New Thinking." *Wall Street Journal* (August 25).

Whittall, C., and Goldfarb, S. (2016) "Black Hole of Negative Rates Is Dragging Down Yields Everywhere." *Wall Street Journal* (July 10).