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MONETARY POLICY AFTER THE CRISIS AND ALTERNATIVE SYSTEMS FOR MACROECONOMIC STABILITY

by Chris Kuiper

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Abstract
This policy essay examines how the Federal Reserve's monetary policy contributed to the most recent financial crisis of 2007–2008 and how policy decisions since the aftermath of the crisis may be encouraging further monetary distortions. Viewed through the lens of the Mises-Hayek business cycle theory, the Federal Reserve may be again undertaking actions that could cause unsustainable misallocation of resources or, at the very least, distortions in critical price signals. This paper concludes by considering alternative institutions and policies that might replace our current discretionary monetary regime. A free-banking system, it argues, would harness the power of the market process to prevent future imbalances by using microeconomic incentives that result in macroeconomic stability.

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1 Introduction

The 2007–2008 financial crisis, stock market crash, and ensuing recession have caused untold harm to the American people. Described by many as the greatest financial crisis since the Great Depression, it brought on incredible financial and economic harm as well as the stress and emotional harm that come with unemployment and the vaporization of trillions of dollars of wealth from investment and retirement accounts. This is, of course, what makes the event so important to study. In order to prevent another crisis of this magnitude, we must understand what went wrong.

In what follows, I focus on one set of policies that contributed to the financial crisis: the Federal Reserve's (the Fed's) monetary policy. I briefly review the business cycle theory proposed by Ludwig von Mises and extended by Friedrich A. Hayek in section 1. In section 2, I show how the Mises-Hayek theory explains why there was an unsustainable boom and inevitable bust in 2008. In section 3, I consider the actions of the Fed since the height of the crisis to determine whether monetary distortions are occurring today. In section 4, I examine alternative institutions and policies that might replace our current discretionary monetary regime. I argue that a free-banking system would harness the power of the market process to prevent imbalances and unsustainable booms and busts caused by monetary distortions.

2 Central Bank Interventions as Cause of Boom and Bust Cycles

The modern formulation of the theory of economic and financial cycles has a long and rich history. The theory of economic cycles that result from excess credit creation began with Ludwig von Mises in his 1912 publication *The Theory of Money and Credit.* Having been expanded on by Hayek ([1929] 1966, [1931] 2008), it is often referred to as the Austrian Business Cycle Theory. However, central to this theory is the notion of an equilibrium or "natural" interest rate, a concept that goes back to Swedish economist Knut Wicksell (1898), who was influenced by earlier works by Austrian economist Eugen von Böhm-Bawerk (1890, 1891).

Wicksell made a distinction between the real equilibrium rate of return on capital, or the natural rate, and the market rate that actually prevails. The latter is affected by central bank rate targets and market expectations about future policy rates, as well as by market supply and demand for financial assets and the risk premia attached to them. The natural rate reflects only real factors, not monetary factors; it is the rate that balances savings and investment and coordinates intertemporal economic activity.

The Mises-Hayek explanation for business cycles begins with excess credit, which is brought about by central bank actions. By expanding the supply of credit, the central bank artificially pushes down market interest rates below the natural rate (or holds the market rate down when the natural rate rises because of new investment demand). Ordinarily, interest rates are reliable price signals that indicate the price of borrowing money or the opportunity cost of lending money on the basis of people's time preferences. Undistorted interest rates convey useful and necessary information to prospective borrowers and lenders or savers.[1]

[1] There are of course many interest rates, not just one, and the central bank only explicitly targets the interbank lending rate (i.e., the federal funds rate). As such, we should not state that the central bank directly "controls"

When interest rates are driven or held too low by the central bank or are below what they would have been absent central bank intervention, it falsely signals to investors and businesses that savings have increased and therefore credit is cheap and abundant. This in turn prompts or enables the businesses to undertake additional projects or expand existing projects. At the same time, the too-low interest rates signal to consumers an artificially low opportunity cost of consuming rather than saving; consumers will then spend more in the present than if the market rate were tracking the natural rate. With both investors and consumers spending more in the present, an economic boom is created (Garrison 2000).

Once it is realized that the price signals were false and that saving is not sufficient to allow completion of all the undertaken investment, the boom will reverse, turning into a bust. The central bank's intervention and manipulation of a key price component causes a distortion in the capital market, not unlike how all price interventions necessarily cause distortions in some form or another. The capital market distortion leads to a misallocation of resources, which eventually must be liquidated and reorganized. The liquidation and reorganization of resources results in recessionary conditions in which production slows as capital and labor are reallocated.

3 Too Low for Too Long: The Federal Reserve and the 2008 Crisis

The theory that artificially suppressed interest rates and excess credit creation engender a boom that must eventually bust explains, at least in part, the financial crisis that began in late 2007 and continued through 2008 (Boettke and Horwitz 2009; Boettke and Luther 2010; Cachanosky and Salter 2016). Granted, the financial crisis was an extremely complex event involving a complex economy, an intricate financial system, and a host of institutions, all of

interest rates. However, the central bank can influence rates, at least in the short run, through monetary policy and its effect on the expectations of market participants.

which played roles in the crisis. The debate over which institutions, policies, and actors "caused" the financial crisis will continue well into the future, and it is likely that no single policy or actor caused the entire crisis.

Nevertheless, as will be subsequently shown, the financial crisis played out in a manner consistent with the Mises-Hayek theory previously explored in brief. At the beginning of 2001, the federal funds target rate was 6.5 percent (Board of Governors of the Federal Reserve System 2016a). The Federal Reserve quickly lowered the target rate through the 2001 recession, bringing it down to 1.75 percent by the end of the year. The Fed continued to cut the interest rate target twice more, even as a recovery began. By mid-2002 it had reduced the target rate to a mere 1 percent and held it there for two years, through mid-2004, before gradually raising rates by quarter percentage points.

The ultra-low interest rates made credit cheap for producers, investors, and consumers. Those participants acted rationally by borrowing more and undertaking more projects than had previously appeared to be profitable. But the rates did not reflect true preferences. Credit was not cheap because more people were saving and looking to consume more in the future; credit was cheap because of Federal Reserve policies.

The theory of the boom-bust cycle instigated by artificially low interest rates and excess credit focuses on the natural, or equilibrium, interest rate. This theory hinges on the idea that the misallocation of resources occurs because central banks artificially suppress the market interest rate below the natural rate. In other words, if market rates were not suppressed below the natural, or market clearing level, no misallocation would occur.

Unfortunately, because the natural rate is unobservable, it is impossible to point to a natural rate and compare it to the market rate to show that the market rate was artificially

suppressed below the natural rate. Therefore, how can we know the Federal Reserve did indeed push market rates below the natural rate?

Borio and Disyatat (2011) offer one technique to judge *ex post* whether this occurred. Consider that the natural rate is the rate that balances savings and investment and thereby coordinates people's time preferences with firms' production plans. Thus, if market rates are at or near the natural rate, we should see general coordination. However, it is clear that in the lead-up to 2008 there was a gap—or a large enough discrepancy between the natural and market rates, as evidenced by the buildup of imbalances and the boom and bust. In other words, if the natural rate is by definition an equilibrium rate, then the obvious dis-equilibrium experienced during the run-up and crash of 2008 is evidence that the market rate was not closely following the natural rate.

Borio and Disyatat go on to ask what kind of developments we would observe if the market and natural rate continued to diverge. According to Wicksell, we should see the imbalance result in inflation; but inflation, in terms of a rise in consumer prices, was tame during the recent credit crisis. The authors note that others, such as Hayek, argued the distortion would be observable in relative prices.

A distortion is clearly evident when one looks back at the crisis and the massive asset bubble in housing and related housing credit. As Borio and Disyatat state, "It is hard to imagine that goods markets can be in full equilibrium, and hence growth sustainable, in the presence of such credit booms. If anything, the subsequent full-blown financial crisis suggests that the unusually rapid credit expansion was a sign that market rates were below the natural rate" (2011, 22).

John B. Taylor, of the famed "Taylor Rule," has also suggested a method for knowing that the Federal Reserve set interest rates below the natural level. The Taylor Rule is a monetary rule that states where the Federal Reserve should set the nominal interest rate target, given the current inflation rate and GDP output gap and the Fed's respective goals for these metrics (Taylor 1993).

Taylor shows that from 2002 through 2004, the Fed's interest rate decisions were well below what the Taylor Rule prescribed, resulting in too-loose monetary policy that led up to the housing boom (Taylor 2009b). To be sure, the Taylor Rule is by no means perfect, nor do I endorse it as a prescription here. For example, one flaw of the rule is that it requires an assumed natural or neutral rate (which we know is unobservable and, we can presume, constantly changing) as well as an estimate of potential output.

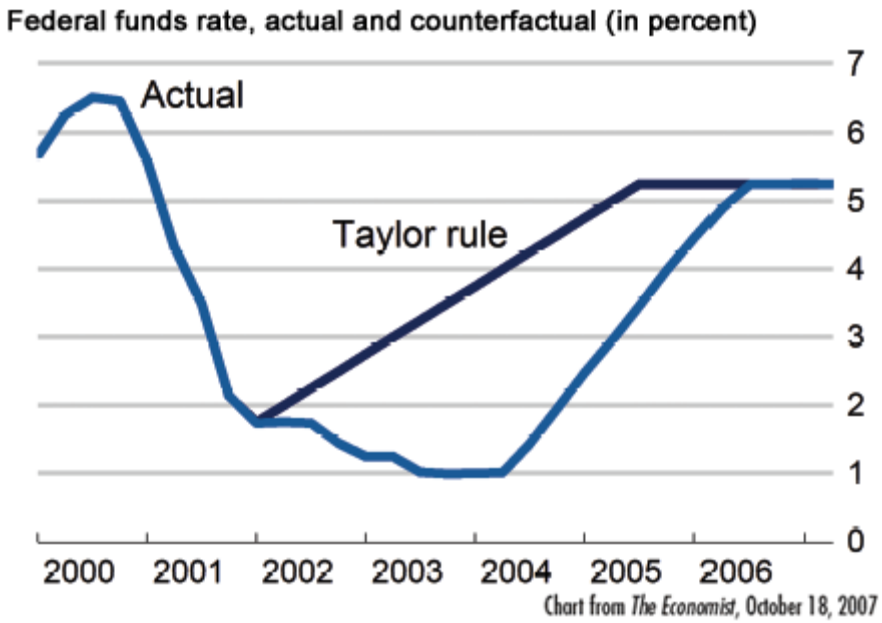

Figure 1: Actual Federal Funds Rate vs. the Taylor Rule (%)

Source: "Fast and Loose: How the Fed made the subprime bust worse." The Economist, October 18, 2007. https://www.economist.com/node/9972453.

However, Taylor's general point is still salient. Taylor argues that the rule was generally followed over the previous 20 years of good economic performance, but from 2002 through 2005, the Federal Reserve clearly deviated from historical precedent (see figure 1). The rule therefore "provides an empirical measure that monetary policy was easy during this period" (Taylor 2009a, 3).

This gives some empirical support to the notion that market interest rates were too low and monetary policy was too easy or loose. Even though we do not know the natural rate of interest, by observing resulting imbalances as well as comparing the policy to historical policy actions, we can reasonably see how monetary policy was likely too easy.

An illustration may assist this point: Suppose we do not have the tools to observe how many calories a person burns in a day, but we do have the ability to measure the calories the person consumes. We also know that if calories consumed equals calories burned, the body is in "equilibrium," and no weight will be gained or lost. Given this, we can deduce whether the person is consuming too many calories by looking for weight gain. If the person gains weight, we can safely assume that calories consumed has increased (all else being equal, of course). This is similar to Borio and Disyatat's point that the observation of financial imbalances means market rates were not at equilibrium rates.

Relatedly, we could compare the trend of a person's calorie intake over time with the person's weight, and we might observe that taking in 2,000 calories per day keeps the weight stable. We could therefore safely assume that *deviating from this historical trend* and increasing caloric intake would logically increase weight. This is similar to Taylor's point that the Federal Reserve clearly deviated, starting in 2002, from its historical trend and fueled the excesses of the housing bubble.

Another tool to analyze monetary policy is the growth of the money supply itself. While there are numerous measures to analyze this, depending on what is included as "money," one of the more popular measures is the M2 money supply. As previously noted, the Federal Reserve started aggressive monetary easing policies with the 2001 recession, as can be seen in the lowering of the federal funds target. This was necessarily accompanied by an increase in the money supply. The year-over-year growth in the M2 monetary aggregate hit a high of over 10 percent by the end of 2001 before slowly descending to a low of over 3 percent by 2005 (Board of Governors of the Federal Reserve System 2016b).

In addition, Lawrence H. White outlines another measure that can be used to judge whether the Fed expanded more than it should have. He starts with the premise that to make central bank policy as neutral as possible toward the financial market, the Fed should aim for stability (zero growth) in the volume of nominal expenditure (White 2009, 117). Using the equation of exchange, $MV = Py$, this implies that the Fed should not offset growth in real output (y) due to productivity with injections of money (M), but should instead let prices (P) naturally fall.

The second-best option would be to have nominal expenditure grow in a predictable, low, and steady manner. Using the dollar volume of final sales to domestic purchasers as a measure of nominal expenditure, White notes that that metric has been anything but predictable, low, and steady. From the start of 2001 through the end of 2002, it was a positive, but moderate, growth of 3.5 percent per year. By 2003 the growth rate jumped to 6.5 percent. Despite this, the Fed continued to keep its target interest rate at 1 percent before its first rate increase in mid-2004. The easy money polices then showed up as nominal expenditures and climbed to 7.1 percent (White 2009, 117–18).

There is a growing body of literature that explores how the central bank contributed to the financial crisis through easy money policies, or specifically by driving a wedge between the market and natural rates of interest, but it is beyond the scope of this paper to review it in its entirety. However, meta-studies reviewing all of the current literature on this topic have found nearly a dozen studies and published works that either point explicitly to the Mises-Hayek theory of the trade cycle and the divergence from the natural rate or tell a similar story without explicitly referencing that theory (Cachanosky and Salter 2016).

The importance of reviewing this literature is to recognize that the Mises-Hayek theory of the business cycle is gaining recognition and momentum, along with the notion of a central bank as an institution that may cause these financial imbalances and contribute to the boom-bust cycle. This recognition comes not only from scholars familiar with the work of Mises and Hayek, but even from popular and mainstream outlets such as the Bank of International Settlements. Central banks need to be evaluated on their performance, and the notion that they can perpetuate or cause a boom-bust cycle must be addressed. Once this is done, alternative systems can then be compared and discussed.

4 Central Bank Interventions Post-crisis

Following the crisis, the Federal Reserve took massive and unprecedented steps in targeting ultra-low interest rates and supplying the economy with additional credit. There were massive injections of base money during the height of the credit crisis, about which much could be (and has been) written. For the purpose of this paper, however, I limit my attention to central bank actions *after* the crisis, when many considered the economy stabilized.

Even though it has been more than seven years since the height of the crisis, the Federal Reserve has continued to keep its target interest rate near zero, making the real target rate negative (see figure 2). Furthermore, it has supplied additional credit and has sought to lower other interest rates (such as that of long-term government bonds) through programs of "quantitative easing." If such policies contributed to the last financial crisis, then this raises the question of whether the actions taken by the Fed since the crisis will contribute to financial imbalances and make future booms and busts unnecessarily severe.

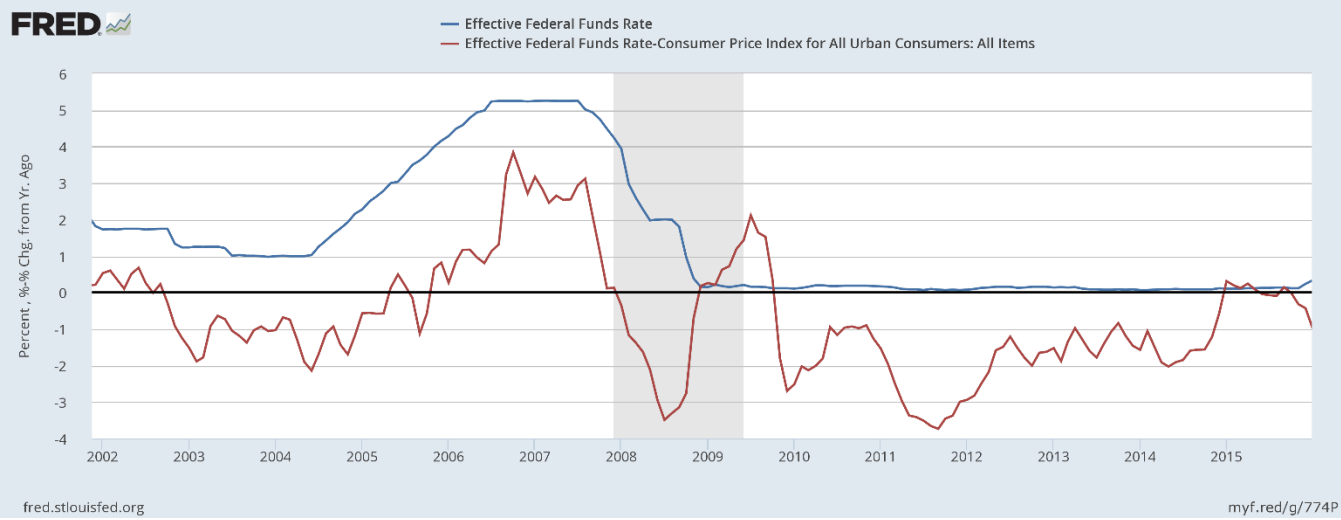

Figure 2: Real vs. Effective Federal Funds Rate

Sources: Bureau of Labor Statistics 2016, Board of Governors 2016; myf.red/g/774P.
Note: Y-axis label refers to a percent change from one year ago. This lag is employed to eliminate seasonal patterns from a series that has not been seasonally adjusted.

As previously discussed, there is no easy or definitive way to know if a central bank is holding market interest rates too low—that is, below the natural rate. However, a few empirical observations suggest there may be growing financial imbalances due to these unprecedented policies.

According to Wicksell, the imbalances would manifest themselves in higher prices or inflation. Today's consumer price inflation measures remain relatively tame, averaging around

1–2 percent since the crisis. Yet consumer price inflation remained low through the development of the last housing boom as well. Instead, as Hayek observed, we do not necessarily need to see aggregate price levels increasing in order for relative prices to be distorted ([1929] 1966, 124–25).

Financial assets are one area in which relative prices are being distorted. For example, the stock market is currently bid up to nearly unprecedented valuation levels. One straightforward and reliable way to observe the valuation of equity markets is to look at the price-to-earnings ratio. This can be done for either an individual security or for a market index as an aggregate. As of data through September 2016, the S&P 500 stock market index was trading at a price-to-

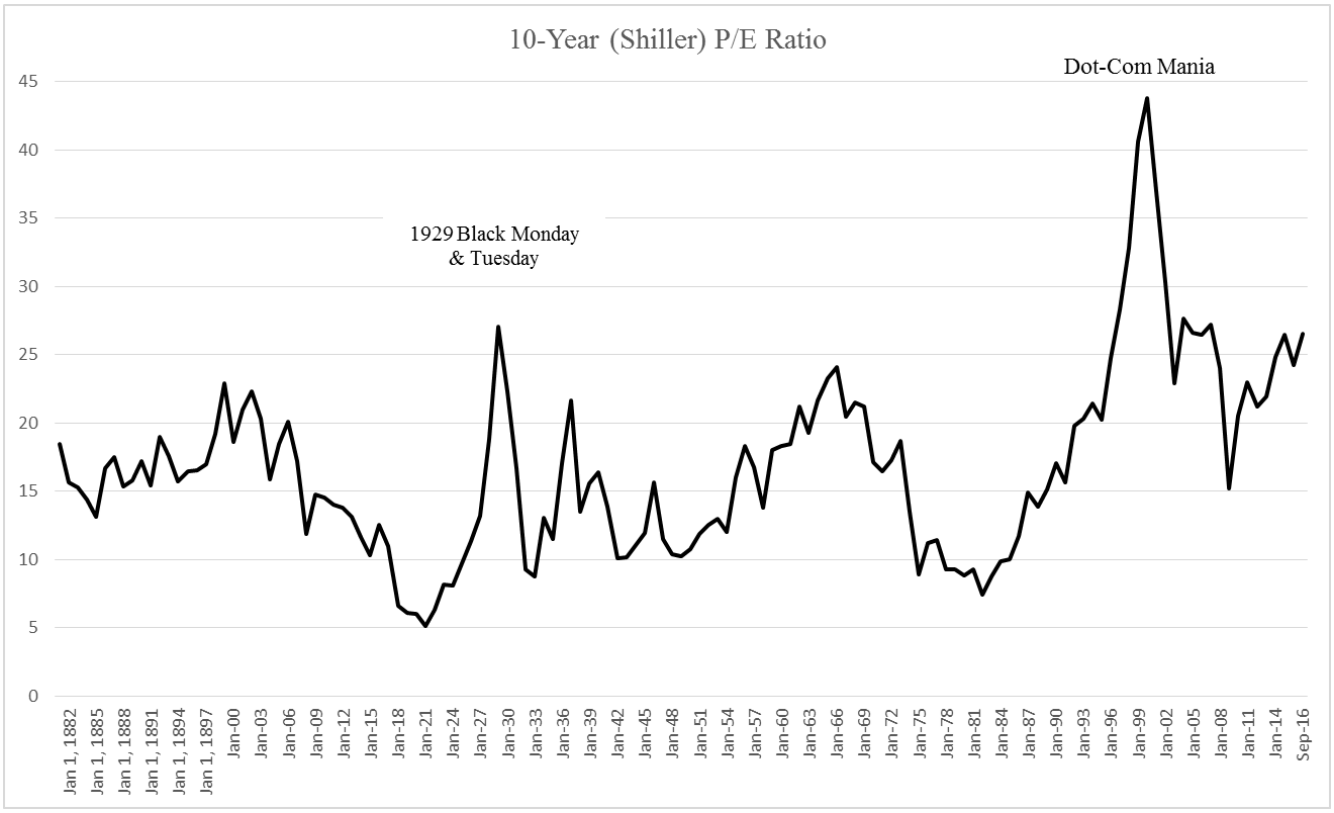

Figure 3: 10-Year (Shiller) P/E Ratio over Time

Source: Robert Shiller, "Online Data—Robert Shiller," accessed September 10, 2016, http://www.econ.yale.edu/~shiller/data.htm.'

earnings ratio of nearly 27,[2] meaning investors are willing to pay $27 for every $1 in annual earnings that a company generates. This ratio has been higher only twice in more than 140 years of S&P 500 history: during the dot-com boom of 2000–2001 and over a two-month period in 1929 before Black Monday and the Great Depression.[3]

The link between Federal Reserve policy and the stock market is not direct, yet there is an uncanny match between the size of the Federal Reserve's balance sheet and the level of the S&P 500 stock market since 2009. Investors are forward-looking. As the Federal Reserve announces or signals additional easy money, investors rationally bid up equity prices. Additional evidence can be seen in the performance of the stock market during times of quantitative easing compared to times when quantitative easing is not in force. Although correlation is not necessarily causation, the fact that the quantitative easing policies were repeatedly "turned off" and then "turned on" again provides more evidence that market participants were indeed reacting to these programs.

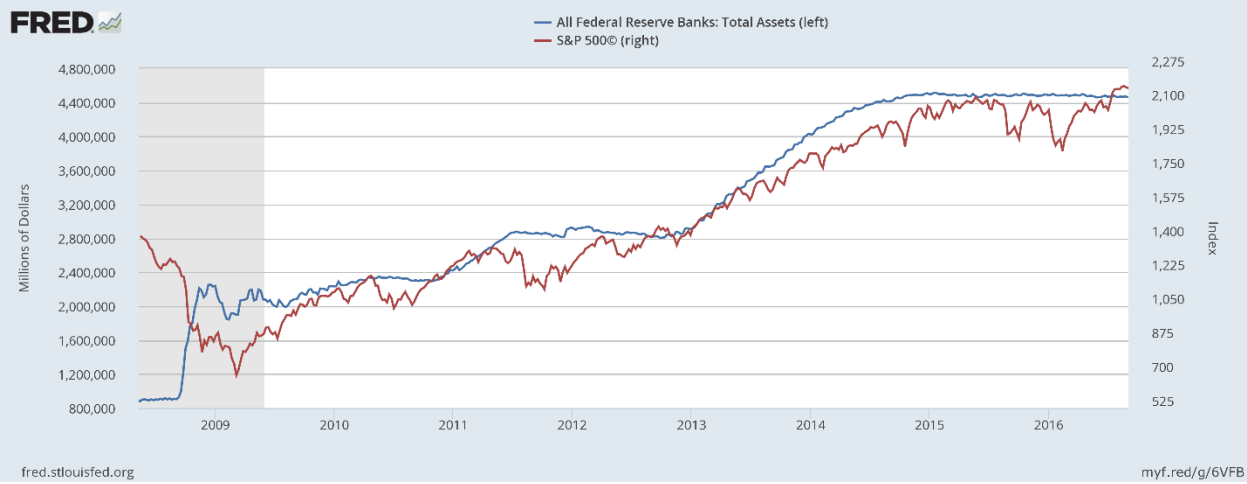

Figure 4: S&P 500 Compared to Federal Reserve Balance Sheet

Sources: Board of Governors 2016, S&P Dow Jones Indices 2016; myf.red/g/6VFB

[2] This is averaged over a rolling 10-year period to filter out noise and short-term fluctuations.
[3] Robert Shiller, "Online Data—Robert Shiller," accessed September 10, 2016, http://www.econ.yale.edu/~shiller/data.htm.

Bonds are currently valued at extremely high levels as well. In the past, price levels of stocks and bonds have moved inversely to one another as investors shift into bonds during downturns for safety and then move into stocks as the economy improves, businesses demand more capital, and investors are willing to take on more risk. Never before in history have stocks been so expensive (based on a price-to-earnings ratio above 20) while bonds have *concurrently* been expensive (based on the 10-year treasury yield below 2.5 percent) (Short, accessed May 2, 2016). This suggests excess credit and money is flowing into any and all readily available financial assets, despite extreme valuations. This situation is not unlike money flowing into all housing-related assets despite extreme valuations.

Figure 5 plots the 10-year treasury yield (x-axis) against the price-to-earnings (P/E) ratio (y-axis), showing the relationship between stock and bond valuations on a monthly basis since January 1, 1881. As can be seen, the majority of the data points are clustered around the median P/E ratio of 16 and a bond yield of slightly under 4 percent. It can also be observed that there is generally a historical linear relationship between stock and bond prices: as the P/E ratio goes up (stocks get more expensive), bond yields also go up (bonds get less expensive). This is concurrent with investor behavior whereby when sentiment turns more positive (risk seeking), stocks go up and bonds go down, and of course vice-versa. The times that deviate from this linear trend and "push out" from the linear relationship are after market crashes (when stocks became incredibly cheap in the 1920s and 1930s) as well as during the stagflation era. Our particular focus is on how, since January 2010, stocks and bonds have concurrently become expensive. As can be seen in the figure, they are indeed pushing into new territory in the upper left quadrant of the graph.

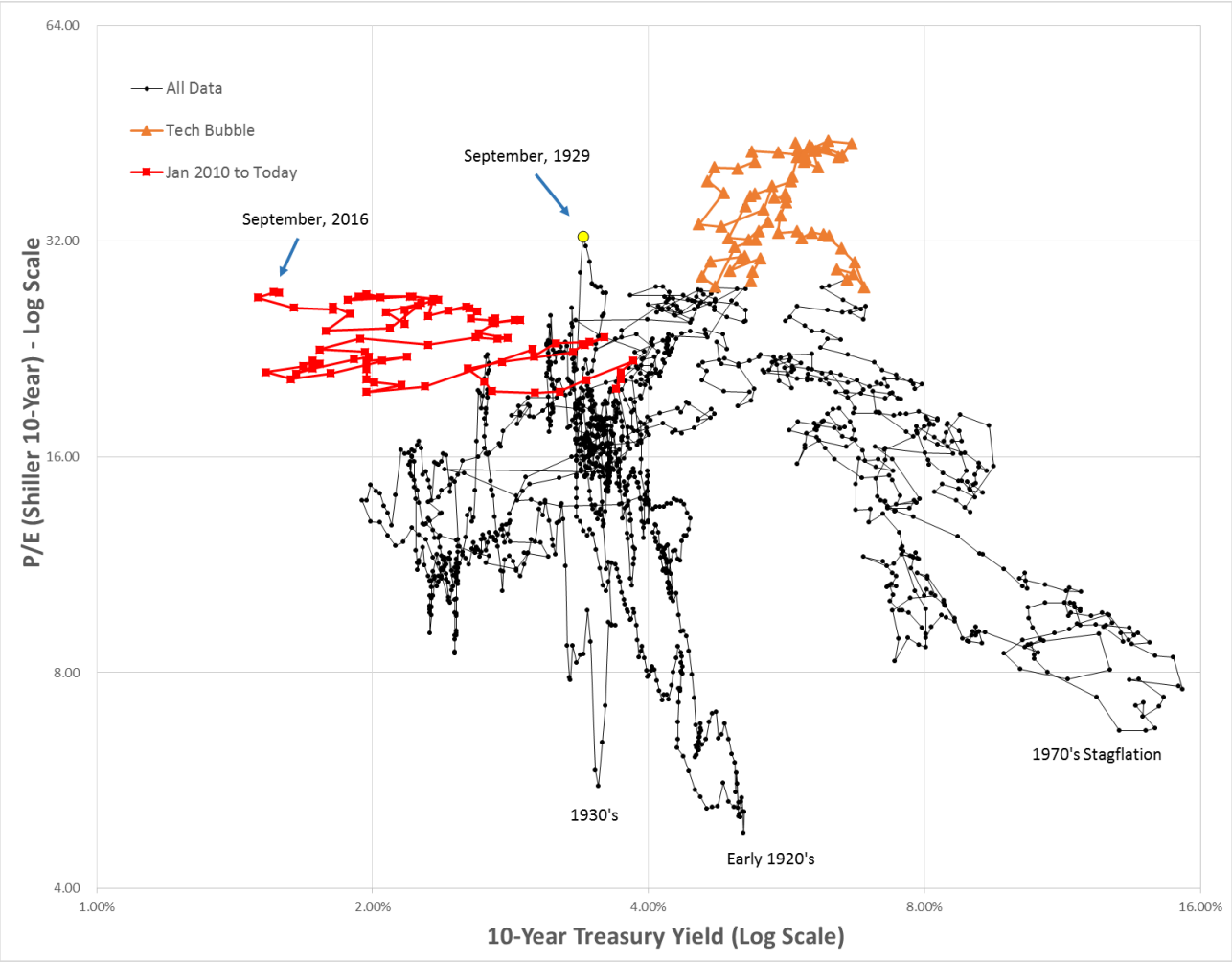

Figure 5: Shiller P/E and 10-Year Treasury Yield

Source: Shiller 2016; United States Treasury 2016.

We can also employ the Taylor Rule to get a rough estimate of where Fed policy should be in terms of inflation and output (figure 6) and see if monetary policy is again too loose, similar to what John Taylor observed before the last crisis. If the gap between the Taylor Rule's prescription of responsible monetary policy and where monetary policy was actually operating helped to fuel the housing boom, then there is an even larger gap observed today.

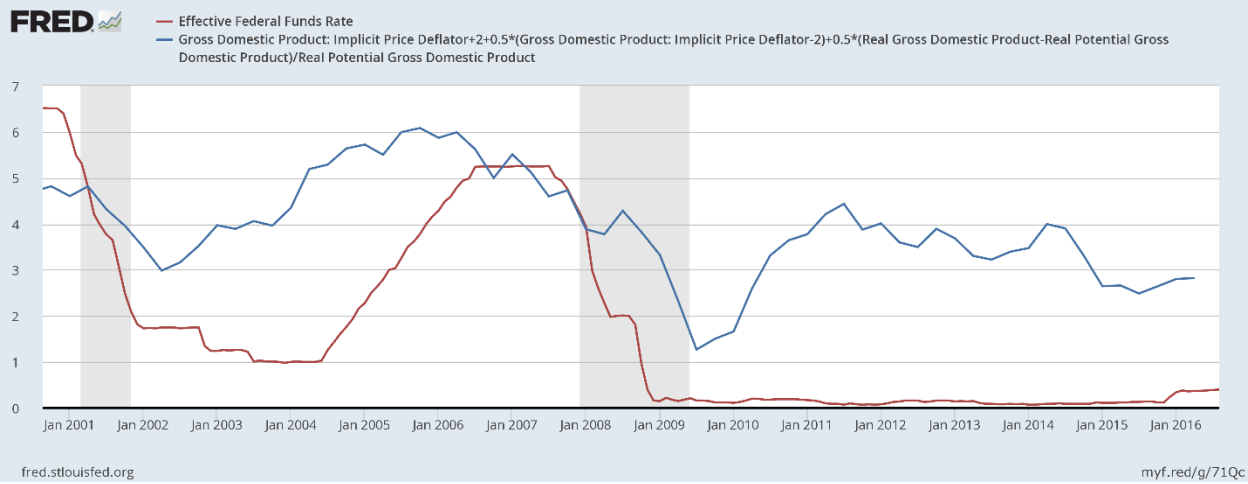

Figure 5: Effective Federal Funds Rate vs. Taylor Rule, 2001–2016

Sources: Bureau of Economic Analysis 2016, Board of Governors 2016, Congressional Budget Office 2016; myf.red/g/71Qc.

In contrast to this, many scholars are exploring the idea that the market rate of interest is not being unduly influenced by central banks, but that instead the market rate and central banks are *following* the natural rate, which has been and continues to slowly decline and remain low. In other words, rates are low not because of central bank action, but because the natural rate is currently low. These scholars contend the natural rate is low due to a variety of structural or fundamental factors, most notably a "secular stagnation" (Summers 2014) and related factors such as the productivity slowdown, low population growth, decreased demand for investments (Rachel and Smith 2015), or even a global savings glut (Bernanke 2015).

It is beyond the scope of this paper to address each of these points individually and in detail. However, in regard to productivity, slowing or declining productivity is expected to produce downward pressure on real interest rates. Yet we have still seen a rather large gap between the change in productivity and the real federal funds rate since the crisis (figure 7). While productivity and the real federal funds rates used to move in line with each other, there was a large deviation before the housing boom, concurrent with Taylor's view of Fed policy. As

productivity rose, the Fed chose to keep rates low rather than follow productivity and raise rates. This caused a disequilibrium that helped fuel the global asset inflation (Beckworth 2008). Although the gap is not quite as large as that of pre-crisis times, it has still persisted since the most recent crises, as the Fed has kept the federal funds rate target well below any positive change in productivity.

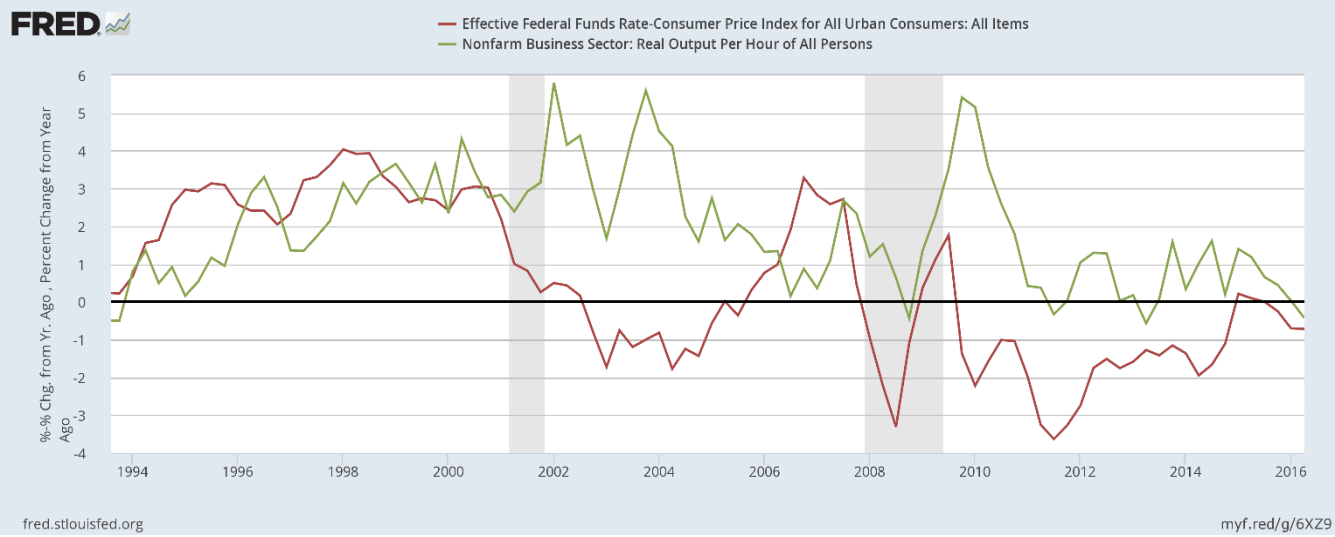

Figure 6: Productivity vs. Real Federal Funds Rate

Sources: Bureau of Labor Statistics 2016, Board of Governors 2016; myf.red/g/6XZ9
Note: Y-axis label refers to a percent change from one year ago. This lag is employed to eliminate seasonal patterns from a series that has not been seasonally adjusted.

More interestingly, the productivity slowdown and general sluggishness of the economy could actually be *symptomatic* of the boom and bust caused by erroneous central bank policy, not occurring despite it. That is, we could still be feeling the negative side effects of the misallocation of resources, and it could be continuing to reduce productivity today. This is consistent with the Mises-Hayek theory, as resources get misallocated in the boom, and even after the initial financial bust, they must be reallocated. Depending on policies and how flexible

the labor and capital goods markets are, this could take time. The Bank of International Settlements appears to adhere to part of this theory; its latest annual report states:

> . . .financial booms can undermine productivity growth as they occur; a good chunk of the erosion typically reflects the shift of labour to sectors with lower productivity growth; and, importantly, the impact of the misallocations that occur during a boom appears to be much larger and more persistent once a crisis follows (BIS 2016, 12).

The report goes on to specifically counter the "secular stagnation" theory of declining productivity, noting that the financial boom and bust has caused long-lasting damage and that the outsized boom preceding the crisis actually masked and exacerbated the decline in productivity growth (BIS 2016, 14).

> Alternatively, persistently low yields could end up having pernicious effects on the economy and become to some extent self-validating…They may also distort financial and real economic decisions more generally, for instance by encouraging unproductive firms to maintain capacity or by inflating asset prices, thereby weakening productivity (BIS 2016, 34).

This theory is further expanded upon by Hoffmann and Schnabl in a recent working paper, where they maintain that loose monetary policies are "responsible for the decline in investment and growth and therefore the decline of the natural interest rate…" (2016, 8) as defined by Laubach and Williams (2015). The authors identify a few mechanisms through which this happens: First, the "creeping nationalization of lending," where central banks increasingly supply credit and liquidity. Banks with excess liquidity invest with the central bank (as we have seen with the explosion in reserves held at the central bank and the interest paid on those reserves) rather than supply liquidity to other banks, and those that need credit go directly to the central bank (Hoffman and Schnabl 2016, 9).

Furthermore, as interest rates decline, the cost of borrowing declines, increasing corporations' profits and savings. Yet we have not observed corporations spending those

additional profits on expansions, research and development, or other investments. Corporations have been taking advantage of the low rate environment by issuing record-low-yielding bonds, but instead of using this debt for investment, they are returning capital to shareholders in the form of share repurchases (i.e., buybacks). This is consistent with the BIS theory that easy money can encourage unproductive firms to maintain capacity or inflate asset prices. Instead of seeking real investment opportunities that in the past had a high rate of risk, the low interest rates incentivize management to take the easiest path of boosting earnings per share (and therefore executive bonuses) through share buybacks. As can be seen in the two figures that follow, the amount of shares repurchased and the number of S&P 500 companies repurchasing shares are back near former highs. More alarming is the number of buybacks that continue despite a sharp decline in net income (figure 9). Over one-quarter of all S&P 500 companies' share repurchases now exceed their company's net income and free cash flow (on a trailing 12-month basis), meaning the companies are using debt to fund the buybacks. When the boom turned to bust and investment opportunities dried up, resources had to be reallocated, but the ensuing easy money and low interest rates have only incentivized companies and banks to allocate capital to investments that have a low-hurdle rate of return (like buybacks) rather than invest in more risky and difficult prospects that could increase productivity.

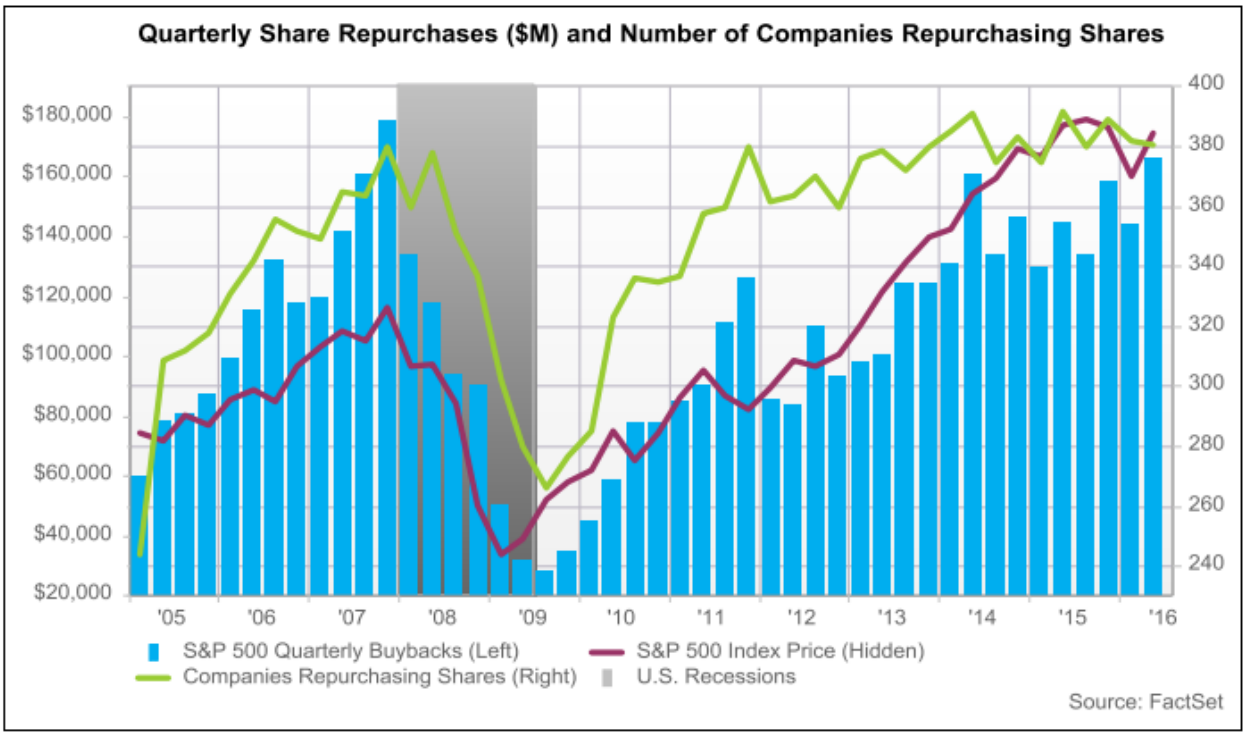

Figure 7: Quarterly Share Repurchases ($M) and Number of Companies Repurchasing Shares

Source: Birstingl 2016.

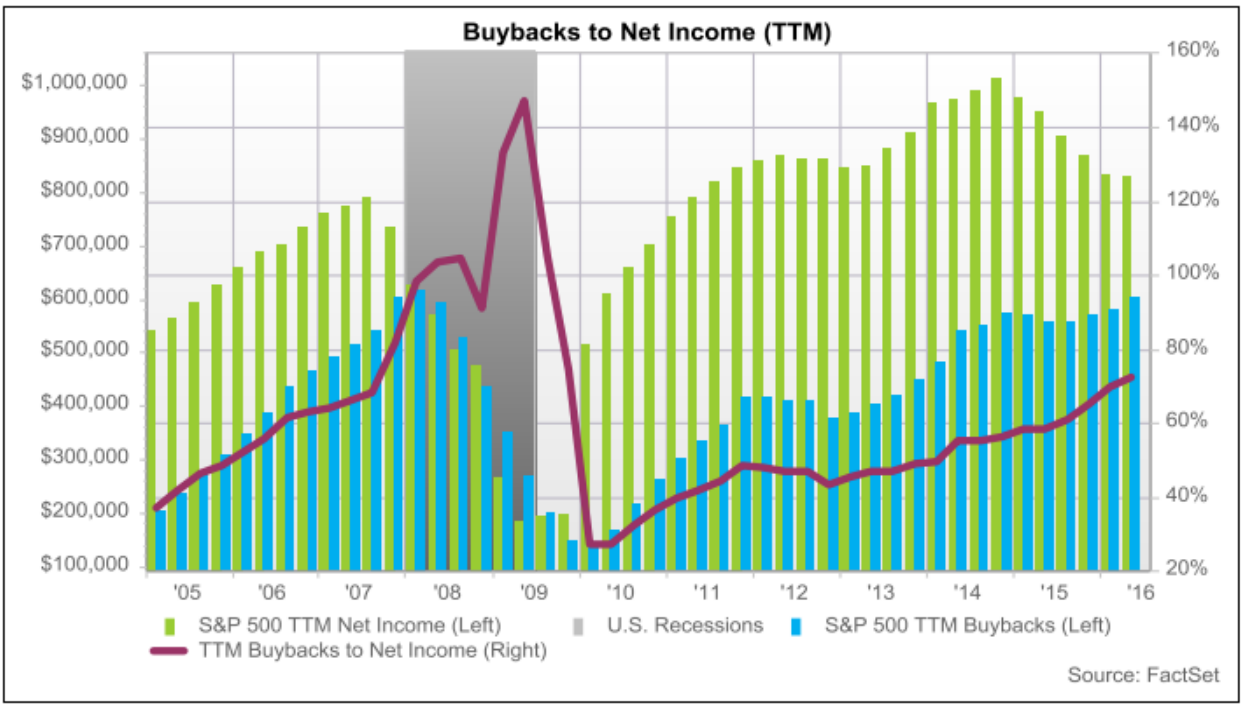

Figure 8: Share Buybacks Compared with Net Income

Source: Birstingl 2016.
Note: TTM = Trailing-Twelve-Month

Second, Hoffman and Schnabl note that there are similar effects in regard to banking, specifically the rise of "zombie banks," which further hamper lending that could increase productivity (2016, 11). Low interest rates allow banks to keep sketchy loans on their books, delaying a structural adjustment. Citing Japan as a case study after its major boom and bust decades ago, the banks continued to provide irrecoverable loans to keep themselves and insolvent companies current (Hoffman and Schnabl 2016, 11). After the credit crisis, similar terms were used in the US banking sector, such as "extend and pretend," which describes loans that bankers know should be written off but instead renew to avoid the capital charge and loss. When companies and banks know cheap credit will continue, the incentive to liquidate poorly performing businesses and find new (but riskier) investments and greater profits is diminished, eroding the entire capitalistic "creative destruction" process that has been responsible for our level of productivity today.

This could have a "ratcheting effect," or what Hoffman and Schnabl refer to as "asymmetric monetary policy." During the boom, easy credit conditions allow additional investments with low expected rates of return to be financed, reducing the marginal efficiency of investment. During the bust, these investments would normally be liquidated. But if central banks influence rates to be lower, and credit and liquidity are increased during and after the crisis, then they will not be immediately liquidated, lowering returns and productivity. Further, if market participants *expect* a declining rate of interest, this leads to "a partial or total absence of the structural adjustment process during the crisis" (Hoffman and Schnabl 2016, 13). Interest rates get continually lowered to levels below those of the last crisis. This can be observed, because rates have declined overall ever since the peak during former Federal Reserve chairman Paul Volker's administration. The asymmetric monetary policy is an implicit insurance policy,

and market participants have been conditioned over the past 30 years to expect this. This practice is in addition to the "Greenspan Put" and the "Jackson Hole Consensus," whereby central banks have agreed they should not try to actively prick bubbles but should only clean up after them with an abundance of liquidity and credit.

Pointing out how central banks can create distortions with their current easy credit conditions, quantitative easing, and low interest rate targets naturally raises the question of where *specifically* those distortions or malinvestments may be taking place today. It is foolhardy to claim to know exactly where or in what form they are taking place, but it may be helpful to make some observations on irregular behavior being witnessed today. As previously mentioned, there appear to be large amounts of capital flowing into both stocks *and* bonds at the same time, something that has never before happened in history.

Particularly of interest is the emergence of negative-yielding bonds, or bonds that require the holder to pay the borrower. There is currently over $13.4 trillion in negative-yielding bonds, primarily in European and Japanese sovereign debt, as both economies' central banks continue their own quantitative easing programs (Wigglesworth and Platt 2016). As foreign bond yields turn negative, investors are increasingly looking toward US bonds for a relatively higher yield on investment.

Unlike stocks, bonds are simpler in terms of return calculation, because there is no subjective estimation of expected growth. Buying a bond with a negative yield-to-maturity *ensures* the holder will get a negative *nominal* return if held to maturity. Therefore, why are investors buying and holding these instruments?

One reason is that yields may be negative, but if they are higher (i.e., less negative) than what some banks are now charging for deposits, then on a relative basis it pays to hold them.

This is the direct result of having central banks enact negative deposit rates. Additionally, in a global financial system in which money must be held in some instrument or another—and given that physical cash would be cumbersome—short-term bonds (especially sovereign bonds) act as a close proxy to cash on the basis of their perceived risk-free status. In other words, investors will pay a small negative yield for the convenience of parking cash in the short term.

Yet this does not explain why longer-dated (such as 10-year) bond yields are now negative. In this case, investors may be buying longer-dated bonds with negative yields in anticipation of yields going even further into negative territory, which would in turn raise the price and offer investors a profit on the capital gain. As BlackRock's Rick Rieder, chief investment officer at one of the largest money managers in the world, recently stated, "The only reason you buy negative-rate bonds is if you think it's going to go more negative" (Cheng 2016). Although someone must hold the bonds to maturity, investors all believe they will sell the bond to another party at a higher price and a later date. This attitude is reminiscent of the latest housing crisis, when investors knew the rental income from a house could not provide a profit based on the price they were paying, but they believed they would earn their return by selling to a "greater fool" at a later time.

> The European Central Bank (ECB) also calls up memories of Fannie Mae and Freddie Mac by standing ready to purchase corporate bonds from the private market through its quantitative easing program. This has, in turn, led some companies and investment banks to issue bonds directly to the ECB, making private placements with the central bank (Whittall 2016). This is similar to what happened with home mortgage loans that were immediately sold to the government-sponsored entities in the United States. Without the bonds facing the test of a private market, and with the ECB mandated to buy 80 billion

Euros of eligible corporate debt each month, it is likely that they are overpaying for such issues, or at least that they have no incentive to scrutinize the profitability of those bonds. This further incentivizes corporations to issue debt with less concern as to using the debt productively.

Other potential areas of misallocation or gross excesses include the high-yield or "junk bond" market, in which less-than-investment-grade companies are able to borrow record amounts of money at some of the lowest yields and lightest restrictions ever recorded. Average yields on junk debt have dropped to a low of 6.16 percent in the United States from 8.74 percent at the beginning of 2016 (Casiraghi, Mayes, and Boston 2016). This is despite the fact that the default rate is expected to reach 6 percent for the year, all but wiping out any gains made from interest payments. (Reuters 2016). Record leverage is not only restricted to the junk bond market; investment-grade debt is also at all-time highs, surpassing the last two crisis levels. This is also notable, as leverage usually climbs the highest and fastest *during* financial crises (Bakewell 2016).

To be clear, these observations do not *prove* that there are financial imbalances due to a gap between market and natural rates, nor is it appropriate to claim a "bubble" has been spotted when bubbles, by definition, are only definitively labeled as such *ex post facto*. Furthermore, these measures of extreme values in financial assets are not timing tools; the unwinding of excesses could happen over a period of years and not in a sudden drop in asset prices. Finally, the theoretical lens of the Mises-Hayek business cycle does not extend itself to identify where or when these imbalances will occur. The theoretical elements of the interest-rate distortion theory are quite narrow. At its core, the role of interest rates is to act as a price signal, coordinating people's decisions and time preferences. However, the auxiliary elements can take on many

forms and are largely dependent on other factors and policies (Horwitz 2011, 19). While all boom-bust cycles retain the same core characteristics, the specifics can be different each time, whether they be excesses in consumer lending, housing, or railroads.

It should also be acknowledged that fundamental factors like lower productivity (which could be driven independently from monetary policy) could indeed be influencing the natural rate and driving it down, especially over longer periods of time. But this does not necessarily exclude central banks from *also* continuing to play a distortionary role in the money and credit markets. Central banks can severely distort these crucial monetary signals, but they do not necessarily abolish them. This only means that these other factors at play make it that much harder for the Federal Reserve and other central banks to grope at the natural rate and set monetary policy accordingly, making a stronger case for an alternative institution.

5 Alternative Institutions

Once the theory of the Wicksellian natural rate of interest is understood, along with the idea that central banks can push the market rate below the natural rate and cause unsustainable booms and malinvestments that must then be liquidated, the policy and institutional implications are quite clear: remove the central bank as an influencer of interest rates and let decentralized market participants push the market interest rates toward their natural equilibrium. Just as prices will emerge in decentralized markets for other things, such as milk or cars, the market price for loans, or more specifically for people's time preferences, will be revealed. Unfortunately, the centralization and distortion of interest rates has a much more detrimental effect on the economy than that of prices for other items, because interest rates affect everything that money touches rather than being contained to one industry.

The socialist calculation debate—and its conclusion that no one person, or group of persons, can replicate the same kind of knowledge generation and efficiency as dispersed market actors—can be applied to monetary policy today. Many economists—even monetary policy experts—will readily admit that the decentralized market brings about equilibrium prices far better than any central planners could. Yet they do not recognize that the Federal Reserve attempts this very thing by trying to set interest rates at the level that *would be* a market clearing level.

It is interesting to note that central bankers themselves, such as former chairman Ben Bernanke, implicitly recognize this. First, they recognize that there is a natural or equilibrium rate of interest, and second, they see a tension between the fact that this rate is unknown and unobservable but that central banks nevertheless try to guess and grope at what it is. In one of his first writings at the Brookings Institute, Bernanke notes:

> "If the Fed wants to see full employment of capital and labor resources (which, of course, it does), then its task amounts to using its influence over market interest rates to push those rates toward levels consistent with the equilibrium rate, or—more realistically—its best estimate of the equilibrium rate, which is not directly observable. …if it seeks a healthy economy, then it must try to push market rates toward levels consistent with the underlying equilibrium rate." (Bernanke 2016).

Bernanke goes on to note that the Fed has no choice but to set the short-term interest rates *somewhere* and that the best strategy for the Fed is to set rates at the equilibrium level. Given that Bernanke recognizes that the economy will operate most efficiently at the equilibrium rate and admits that the Fed has only a best estimate of the equilibrium rate, it is clearly a possibility that the Fed will set rates different from the equilibrium rate. Therefore, an alternative to this institutional arrangement would be to admit this knowledge problem and concede the task of finding the "right" interest rate to the market process. This is similar to the central planner conceding that individuals in the marketplace would be better at setting the price of steel.

It is also important to note the asymmetric payoffs to this current system, in which the Fed is an institution with complete discretion over monetary policies. In the best-case scenario, the Fed will attempt to influence market rates to be consistent with the natural rate. If correct, the economy will not be disturbed, and monetary forces will not have a destabilizing or distortionary effect on the economy. But if incorrect, the Fed could potentially unleash massive distortionary effects on the economy. Indeed, the last financial crisis as well as previous episodes of severe booms and busts suggest as much. Relying on a room of governors to properly set and maintain the correct monetary policy in the face of an ever-changing environment merely to achieve a nondistorted structure of production is a fragile institutional arrangement. If the board of governors is incorrect in its policy (which is very likely, given the limitations discussed later), then large distortions and economic pain will ensue.

Once one realizes the Federal Reserve is not a robust system, the next step is to determine which set of institutional arrangements would best achieve a market system in the setting of interest rates and monetary policy in general. In order for the market to set interest rates freely, the Federal Reserve would have to be out of the monetary policy business entirely.

Giving up all control of monetary policy could be achieved in a number of ways. One market-based solution to remove the Fed would be to allow free banking, or the free entry and exit of private banking institutions that are allowed to issue their own banknotes as well as keep their own reserves. Participants would likely demand that these banknotes be redeemable in a reserve currency or commodity to ensure the bank did not dilute the value of the banknotes. Lawrence White (2011) has previously proposed such an idea and has made the case that a gold standard with free banking would have restrained the boom and bust.

Banks under this system would do a better job at moving toward monetary equilibrium not because they are actively trying to guess the natural rate and set their rates at this level, but because the microeconomic price signals would inform them of changes in people's time preferences, and because they would have the incentive to make corrections due to the profit motive. As Steve Horowitz has noted, "A free banking system relies upon 'invisible hand' processes to produce money, rather than the more visible hand of a central banker" (Horwitz 2009, 214).

A free-banking system would be made up of individual banks working together through the profit motive, which creates the same "invisible hand" process the market creates for any other good or service. When users of banknotes demand to hold more notes, banks have an incentive to create more and increase the money supply. Conversely, if people wish to hold fewer notes, they will choose to redeem their notes, and the threat of illiquidity will force private banks to rein in and replenish their reserves. It is these *micro*economic decisions and actions that lead to a stable *macro*economic outcome under free banking.

In today's world, where virtually all countries and banking systems operate under a central bank, the idea of free banking seems quite radical and even strange. By exploring this further, we can see such a system is not much different from that of other competitive markets. In a free banking system, banks are like any other business, with the ability to enter the market and provide their services and products as they see fit. Banks could therefore choose to provide customers with currency. Customers would naturally demand this currency be backed by something, or redeemable in something else—a reserve medium. In a truly free system, banks could decide what this medium would be, likely responding to what customers demanded as the safest or most reliable medium, such as gold or other commodities. While not significant for our

purposes, it should be noted that other arrangements for the reserve medium could include simply freezing the amount of Federal Reserve notes and using them as a common reserve medium.

Without a central bank, it would be left to individual bank companies to determine the level of reserves to hold against not only their deposits but also their private currencies. The currency in circulation would therefore be a liability, similar to the deposits currently on their balance sheet. If a bank over-issues currency (i.e., if it issues more currency than the public wants to hold), then it will face redemptions for its currency, causing its reserves to fall and thereby threatening its solvency. There are a number of channels through which over-issued notes could make their way back to the issue bank for redemption. One could be direct redemption (the person brings the note to the bank and demands redemption). Another option would be to deposit the note at a different bank or to spend it, which would also cause the note to be deposited at another bank. It would then return to the original issuing bank directly or, more likely, through a clearinghouse. A free banking system would still have clearinghouses, a function that can be, and has been, served by private institutions and would not necessarily require central banks (Horwitz 2009, 211).

Notice that each individual bank would be acting based on its own profit motive, which in turn would be driven by the demand signals sent by individuals choosing how much currency to hold. Therefore, while banking and note issuance are in some ways more abstract than the business of producing steel, the market process and price signaling work in the same manner on a micro level to bring about macro-level stability. Contrast this to a central bank dictating or trying to match what these individual actors are doing.

A free banking system overcomes the many problems of discretionary monetary systems, most notably informational problems and problems of lags. There are three major lags to discretionary policy, which are most simply outlined by Horwitz (2009, 208). The first is the recognition lag, or the time it takes central bank practitioners to observe changes in the velocity or demand for money. The relevant data needs to be gathered, collected, and analyzed by Fed economists, as well as filtered for noise. By the time a change is recognized, it might already be too late to act.

The second is the implementation lag, or the time between when the bank decides to make a policy change and when the change actually occurs. Currently, the Federal Reserve's Open Market Committee meets just eight times per year, or approximately every six weeks (Federal Reserve 2016). Because changes in monetary policy are usually announced to the market before implementation, the Fed may have to wait over a month to implement policies.

Finally, the third is the effectiveness lag, which is the time from implementation to the effects of the policy. Unfortunately, there is no precise measure of this lag, only a wide-ranging estimate that monetary policy may take anywhere from 6 to 18 months, or more, before its effects are revealed. Furthermore, the effects may or may not ever be fully known, given the other variables and changes occurring at the same time. A free-banking regime would greatly reduce these lags and the general problem of one central institution attempting to execute a macroeconomic policy for an entire economy.

The informational problems of a central bank are severe, but an additional problem of discretionary monetary policy is whether it can remain independent from the political process or whether it can be pressured by the fiscal side to monetize debts. This topic is beyond the scope of this paper, but it is sufficient to recognize that any discretionary system run by a handful of

people will necessarily open the door to political influence. A free-banking regime would not be at risk of this, as its monetary decisions would be decentralized and dispersed.

Finally, another benefit of free banking compared with the current institution is the elimination of regime uncertainty and the entire industry of "Fed watching." Because the Federal Reserve's policy is made on a discretionary basis, there is an incentive to obtain any marginal information that may give clues to its future actions. This has spawned an entire industry of research analysts and journalists who speculate on every cough and nod of Federal Reserve members. The regime uncertainty is also evident in our current system. Despite the Fed's claims of being "data dependent" and its vows to raise rates when unemployment reaches certain levels, it has ignored those previous statements and has consistently moved its goal posts or dropped them entirely, leaving market participants with no way to plan accordingly.

An alternative to a discretionary policy, but not a complete abolishment of the central bank institution, would be a rules-based monetary regime. If a central bank could credibly bind itself to a set of rules, it would eliminate the potential for political influence as well as some of the regime uncertainty and "Fed watching." However, this would still leave problems of data collection and implementation lags. In other words, a rules-based regime would still not allow micro actions to create the price signals needed to guide the right monetary policy. Instead, it still approaches monetary policy from a top-down, centralized perspective.

6 Conclusion

Central banks and others recognize that there are natural and coordinating interest rates. At best, they may be able to guess at and approximate the right rate with their policies, resulting in a fairly coordinated market. But at worst, if their policy is wrong, massive imbalances can occur, such as the 2008–2009 crises. Their historical record illustrates that the latter happens

more than the former. Relying on a handful of people to correctly guess and constantly update a key price component to coordinate an entire economy is not a robust system. Once the notion of central banks as an institution that may fuel and perpetuate unsustainable booms is entertained and explored, alternative institutions can be evaluated. One such alternative is an environment of free banking, which would harness the power of the market process to coordinate the supply and demand of money just as the market process generally coordinates the supply and demand of other goods so well.

Despite the intentions of central banks and others, the economy continually suffers from extreme boom and bust cycles. It is therefore time to critically evaluate the institution that purports to be a macroeconomic stabilizer and examine how, in practice, it may actually be contributing to the problem. If this is the case, then considering an alternative institutional arrangement is necessary, even if it may seem radical compared with the current status quo.

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