

**MONETARY POLICY V. FISCAL POLICY:  
RISKS TO PRICE STABILITY AND THE ECONOMY**

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**HEARING**  
BEFORE THE  
SUBCOMMITTEE ON MONETARY  
POLICY AND TRADE  
OF THE  
COMMITTEE ON FINANCIAL SERVICES  
U.S. HOUSE OF REPRESENTATIVES  
ONE HUNDRED FIFTEENTH CONGRESS  
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## **MONETARY POLICY V. FISCAL POLICY: RISKS TO PRICE STABILITY AND THE ECONOMY**

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**Thursday, July 20, 2017**

U.S. HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON MONETARY  
POLICY AND TRADE,  
COMMITTEE ON FINANCIAL SERVICES,  
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 9:34 a.m., in room 2128, Rayburn House Office Building, Hon. Andy Barr [chairman of the subcommittee] presiding.

Members present: Representatives Barr, Williams, Huizenga, Pittenger, Love, Hill, Emmer, Mooney, Davidson, Tenney, Hollingsworth; Moore, Foster, Sherman, Green, Kildee, and Crist.

Chairman BARR. The Subcommittee on Monetary Policy and Trade will come to order. Without objection, the Chair is authorized to declare a recess of the subcommittee at any time.

Today's hearing is entitled, "Monetary Policy v. Fiscal Policy: Risks to Price Stability and the Economy."

I now recognize myself for 3 minutes to give an opening statement.

Today is not the first time we have seen a breaching of the line between monetary and fiscal policy. Unfortunately, Congress has a long history of forcing the hand of the Federal Reserve to accommodate its profligate spending.

However, following the 2008 financial crisis, the Federal Reserve needed no prompting by Congress to pursue policies that are accommodating Washington's unsustainable fiscal policies and distorting the allocation of credit in our economy.

As Renee Haltom and Robert Sharp explained, "Prior to 1951, the Fed's monetary policy was effectively determined by fiscal policy." That is, the Fed formally agreed to hold interest rates down to facilitate the Treasury's financing needs during World War II. This policy ended with the Fed Treasury Accord of 1951 enabling the Fed to focus solely on monetary policy objectives.

Next came the Interest Adjustment Act of 1966, which required the Fed to reduce interest rates through various channels. But to the dismay of many in Congress, the Fed delayed action on this authority knowing that such actions threatened monetary policy independence.

With more arm-twisting by Congress, the Fed would go on to purchase agency debt in the 1970s, mainly through Fannie Mae,

the Export-Import Bank, and even a \$117 million loan to the WMATA to build the Metro in Washington, D.C.

In those days, the Fed was more resistant to political attempts to force it to interfere with fiscal policy. It recognized the limits of monetary policy and the economic damage that follows from using the Fed as a slush fund for individual interests.

Today's Fed has done a 180, initiating on its own several rounds of quantitative easing that dramatically increase the balance sheet's size in considerable part by paying excessive interest on reserves to fund massive purchases of mortgage-backed securities.

Why does this matter? On the one hand, our unsustainable fiscal policies threaten price stability. When governments cannot pay their bills, they are prone to leaning on their monetary authorities for accommodation. On the other hand, the Fed's foray into credit accommodation, masquerading as monetary policy, only deepens American's distrust in their government.

Under our Constitution, a Congress that is accountable to voters decides how much and where to spend. A Federal Reserve that has taken on that authority by itself weakens the independence of monetary policy, accommodates our unsustainable fiscal policies, and distorts markets.

A full 8 years out of recession and America's typically resilient economy has yet to fully rebound. A more accountable and disciplined monetary policy would go far to get us back on track.

The Chair now recognizes the ranking member of the subcommittee, the gentlelady from Wisconsin, Gwen Moore, for 5 minutes for an opening statement.

Ms. MOORE. Good morning, colleagues, and good morning to our esteemed panel. I just can't wait to delve into this conversation. Although the committee has had several hearings on Fed Reserve policy during and post-crisis, my thoughts of this are on the record.

I have just listened to our distinguished Chair talk about the sad kind of dippin' into our policies here, and yet, we have complained continuously about economic growth.

And basically saying the Fed should have stayed out of the business of trying to right our economy and they have supported contractionary fiscal policy here in Congress and then complaining about the Fed's policy to try to help stimulate the growth. I'm sorry, I just don't get it.

How can you have any credibility about being pro-growth in our economy and then saying the Fed should stay out of it, when what we are doing on this side of the capitol is calling for government shutdowns, defaulting on the debt, cutting food stamps during a recession, cutting PELL grants so our kids can have an education, cutting unemployment benefits, and other countercyclical safety net programs, slashing budgets, cutting things like Medicaid, causing 32 million people to be uninsured.

Now it is just curious, people, that for some reason this Congress is talking up the economy despite the job creation numbers that are the same, just slightly down from President Obama.

Also, I have asked previous witnesses—and I want to see what today's witnesses are going to say—if any of them thought raising rates during the recession would have been a good policy.

They didn't wonder what you were going to say. If you want to see where Republicans want to take the country, look at Kansas. The State was a right-wing Koch-brother economic utopia, and it is a mess because of it, with stunted economic growth and credit rating downgrades.

I am hoping to flesh out some of this stuff with the witnesses here today. Thank you, and I yield back.

Chairman BARR. The gentlelady yields back.

The Chair now recognizes the gentleman from Ohio, Warren Davidson, for 2 minutes for an opening statement.

Mr. DAVIDSON. Thank you, Mr. Chairman. Thanks for holding this important hearing. Before serving in Congress, I owned, operated, and expanded manufacturing companies in Ohio.

As a businessman, I knew firsthand the uncertainty and that fiscal and monetary policy have substantial consequences for small businesses on Main Street. Companies are reluctant to trust the Federal Reserve or Congress to steer our country in the right direction.

During the great recession, the Federal Reserve took bold steps to manage the crisis. They moved on with mobile rounds of quantitative easing and unconventional asset purchases.

By purchasing trillions of dollars in Treasury bonds and mortgage-backed securities, they have kept long-term borrowing costs low and enabled the U.S. to finance massive debt while distorting asset prices, pension funds, and created even more weakness in our banking system.

As Chair Yellen has indicated in her testimony, the Fed will move forward with normalization of its balance sheet, but in many ways the Fed's monetary policy has accommodated irresponsible fiscal policy by Congress. We are on a collision course with a fiscal crisis. As economist Herb Stein said, "If something can't continue, it will eventually stop."

The fiscal challenge before us is to grow our way out of this debt crisis. Deficits do matter. While our national debt is not the sole responsibility for the slow economic growth we will highlight in this hearing, it is certainly a factor. To bring true long-term growth, Washington must move regulatory, fiscal, and monetary policy in the right direction.

The Federal Reserve needs to unwind its large and unconventional balance sheet and return to normal monetary policy. Congress must act swiftly with sound fiscal policy that promotes growth and does not bankrupt America. I look forward to hearing from our witnesses, and I yield back.

Chairman BARR. The gentleman yields back.

Today, we welcome the testimony of first, Dr. Mickey Levy. Dr. Levy is the chief economist for the Americas and Asia at Berenberg Capital Markets, LLC. Previously, he served as the chief economist for the Bank of America and Blenheim Capital Management.

In addition to various corporate roles, Dr. Levy advises several U.S. Federal Reserve banks. Currently, his research focuses on U.S. and global economic and macroeconomic topics.

Second, Dr. Eric Leeper is a Rudy Professor of Economics at Indiana University at Bloomington. His research is focused on fiscal

and monetary policy analysis and the theoretical and empirical study of their interaction.

Before becoming a professor of economics at Indiana University, he worked for 8 years at the Federal Reserve in Atlanta and in Washington, D.C., and currently is a research associate with the National Bureau of Economic Research. Dr. Leeper earned his doctorate in Economics from the University of Minnesota.

Third, Dr. Jared Bernstein is a senior fellow at the Center on Budget and Policy Priorities. He served as the chief economist and economics advisor to former Vice President Joe Biden. He also was the executive director of the White House Taskforce on the Middleclass and was a member of President Obama's economic team.

He has worked for the Economic Institute and the U.S. Department of Labor. Dr. Bernstein's research focuses on many subjects, including Federal and State economic and fiscal policies, income equality, and financial and housing markets. Dr. Bernstein earned a Ph.D. in social welfare from Columbia University.

And finally, Dr. George Selgin is currently a senior fellow and the director of the Center for Monetary and Financial Alternatives at the Cato Institute. He also is a professor emeritus of economics at the University of Georgia. He specializes in monetary history, macroeconomic theory, and the history of monetary thought.

He earned his B.A. in economics at Drew University, and his Ph.D. in economics from New York University.

Each of you will be recognized for 5 minutes to give an oral presentation of your testimony. And without objection, each of your written statements will be made a part of the record.

Dr. Levy, you are now recognized.

**STATEMENT OF MICKEY D. LEVY, CHIEF ECONOMIST FOR THE AMERICAS AND ASIA, BERENBERG CAPITAL MARKETS, LLC**

Mr. LEVY. Chairman Barr, Ranking Member Moore, and members of the subcommittee, I appreciate this opportunity to speak on providing my views on monetary and fiscal policies. Both monetary and fiscal policies have gone off course and need to be reset.

Sustained, unprecedented monetary ease has failed to stimulate the economy. Aggregate demand has actually decelerated since—nominal GDP has decelerated since the Fed instituted QE3.

Fiscal policies have resulted in dramatic increases in debt, but they really haven't addressed some of the key structural factors that are undercutting economic performance. So both monetary and fiscal policies need to be reset, and they both involve significant risks that is their paths right now.

While alarming government debt projection, say by the CBO, focused attention on the future, future concerns are becoming today's realities. The allocative effects of the government's current spending programs and our inefficient tax system are harming current economic conditions.

I fully understand the frustrations about the economy, the sizable pockets of persistently high unemployment, the low wages, and the weak trends in productivity that have all contributed to lower potential growth. We all want better performance.

But the issue is, how to achieve it. As a wealthy nation, we are misdirecting resources through fiscal policy and relying on monetary policy for the wrong objectives. The reality is, monetary policy cannot create permanent jobs. It cannot improve educational skills. Monetary policy cannot permanently reduce the unemployment of the semiskilled or raise productivity or boost real wages.

Yet all too frequently, observers urge the Fed to ease monetary policy, or more recently to delay taking away the excessive ease that has stimulated financial markets, but hasn't stimulated economic growth. The Fed's \$4.5 trillion portfolio and low interest rates reduce budget deficits, but this is temporary.

Look at the CBO's forecast. And that temporary reduction in deficits encourages undesirable fiscal maneuvers and contributes to the Congress' delays in addressing fiscal challenges. It involves very high risk and it really does jeopardize the Fed's independence and its credibility.

The Fed must continue to normalize monetary policy by increasing rates judiciously. Note that the recent rise in rates since December 2015 has had no negative impact on the economy. And it must proceed with its plan to begin unwinding its massive portfolio, although I think the Fed should move more aggressively than their strategy suggests.

The Fed must step back from its policy overreach, including the Fed needs to fully unwind its mortgage-backed securities holdings, \$1.7 trillion—the largest holder in the world of mortgages. It serves no economic purpose. Just think about it.

The mortgage market is functioning just fine. Housing prices are booming. Housing is going up. Why is the Fed in this strategy of allocating credit?

Having said that, the need for fiscal policy—and I know this is a money and banking committee—but the need for fiscal reform is much, much more pressing. The entitlement programs—Social Security, Medicare, and Medicaid—are well-intended and they are important programs for the government and for American citizens, but their persistent spending increases stemming from their flawed structures have clearly impinged on spending for other programs including infrastructure, job retraining, education, and research and development.

This in and of itself, the misallocation of resources, adversely affects current economic performance. It hurts productivity, it constrains wages, it reduces job opportunities for many working age people, and it lowers potential growth. And I might note these entitlements are the primary source of rising debt projection.

So I know my time is running out. Congress faces two paths. It can take one of two. It could avoid reforms, which would mean reinforcing continued disappointing economic growth, allow large pockets of underperformance and labor markets and slow wages to persist. This would generate mounting reliance on income support programs and place more strains on the government.

Chairman BARR. The gentleman's time has expired, but just quickly finish the thought.

Mr. LEVY. Okay. My thought, alternatively, the only other focus is the Fed can pursue meaningful and fair fiscal reforms. And by fair, improve the structures of these programs while maintaining

their intent. That would allow more allocation of resources toward government programs that would really enhance productive capacity. Now is the time to act.

[The prepared statement of Dr. Levy can be found on page 64 of the appendix.]

Chairman BARR. Thank you. Thank you, Dr. Levy, and we will get more testimony from you in the questions and answers.

Dr. Leeper, you are now recognized for 5 minutes.

**STATEMENT OF ERIC M. LEEPER, RUDY PROFESSOR OF  
ECONOMICS, INDIANA UNIVERSITY, BLOOMINGTON**

Mr. LEEPER. Chairman Barr, Ranking Member Moore, and subcommittee members, thank you for inviting me to talk with you. The title of this hearing, "Monetary v. Fiscal Policy," frames the issue in an unfortunate way. The title harks back to the unproductive Keynesian monetarist debates of the 1960s and 1970s.

As I hope my comments make clear, a more constructive way to think about this is as monetary and fiscal policy. This is not merely a semantic point, it is fundamental economics. Basic economic reasoning tells us that monetary policy actions always have fiscal consequences.

Let's start with something routine. The Federal Reserve raises the Federal funds rate in order to reduce inflation. But this isn't the end of the story. A higher funds rate tends to raise all interest rates, including those on government debt. So interest payments on outstanding debt rise.

Now fiscal policy comes into play. Those higher interest payments require higher taxes or lower expenditures in the future to service the debt. The message is to successfully reduce inflation, tighter monetary policy necessarily requires tighter fiscal policy at some point. That fiscal response is essential for the Fed to be able to control inflation.

But what happens if the fiscal response is not forthcoming because the fiscal authority never adjusts taxes or spending? Well, bondholders will see their interest receipts rise, but don't anticipate higher offsetting taxes.

They feel wealthier and demand more goods and services. Higher demand raises prices, counteracting the Fed's original intention to lower inflation.

Appropriate fiscal backing for monetary policy is critical for the Fed to achieve price stability. What I have described arises naturally from a fiscal policy that aims to stabilize the government debt GDP ratio. What is important is that the private sector understands and believes that the fiscal response will eventually take place.

Of course when debt levels are low, the changes in debt service and therefore taxes are modest. Debt service has also been modest during the past decade because interest rates have been extraordinarily low.

The fortuitous fiscal effects of low interest rates, however, may be coming to an end. This committee has heard previous testimony about the process of monetary policy normalization, but there is an important fiscal component to normalization that I want to highlight.



Here is a little accounting exercise. The market value of gross Federal debt is now a bit higher than nominal GDP. If interest rates on government bonds rise from current levels to 6 percent, roughly the average in the post-World War II period, interest payments will rise over time by 5 percent of GDP. That is nearly a trillion dollars.

Debt service now consumes about 10 percent of Federal expenditures. In the late 1980s and early 1990s, at its post-war peak, debt service was 20 percent of expenditures, but then the debt GDP ratio was below 60 percent. Evidently, interest rate normalization carries substantial fiscal implications.

I end by pointing to recent data that underscore the need to look at monetary and fiscal policy together. Short-term interest rates have been below 1 percent for a decade.

Over that period, bank reserves increased by a factor of 52, yet inflation by any measure has averaged less than 2 percent since 2008. Meanwhile, long-term Treasury yields have been trending down, suggesting that markets don't expect inflation is going to pick up.

How can this happen? When massive growth and bank reserves hasn't created inflation because banks happily hold idle and safe reserves whose yield exceeds those in the Federal funds in the short-term Treasury markets. But here is another fact with which you might be familiar. Gross Federal debt has doubled since 2008.

Why hasn't this been inflationary? In a phrase, bond market pessimism. During the financial crisis, there was a worldwide flight to safety. Investors had an insatiable appetite for Treasuries. That appetite continues today, ensuring demand absorbs the expanding supply of bonds.

The question for monetary policy is what happens to inflation and the Fed's ability to control it when the thirst for safety is quenched? The answer hinges on the fiscal response. Thank you.

[The prepared statement of Dr. Leeper can be found on page 49 of the appendix.]

Chairman BARR. Thank you.

Dr. Bernstein, you are now recognized for 5 minutes.

#### **STATEMENT OF JARED BERNSTEIN, SENIOR FELLOW, CENTER ON BUDGET AND POLICY PRIORITIES**

Mr. BERNSTEIN. Chairman Barr, Ranking Member Moore, thanks for the opportunity to testify today. My testimony stresses the following points on monetary and fiscal policy, including important interactions between the two.

First, to most effectively pursue monetary policy in the interest of American families and businesses, our central bank must maintain independence from the political system.

While Congress should monitor the Fed's pursuit of its dual mandate, full employment at stable prices, it must scrupulously avoid any micromanaging of the Fed's work in meeting its mandate.

In this regard, the CHOICE Act, associated with this committee, creates serious economic risks. By aggressively rolling back necessary financial oversight, the Act raises the likelihood of return to underpriced risk bubbles, bailouts, and recession.

Title X of the Act, which establishes procedures by which Congress would micromanage the interest rate-setting policy of the Federal Reserve, threatens to reduce the central bank's essential independence and hamstring its ability to respond to economic downturns and financial market excesses.

This is the strongest caution I can offer you today. To pursue Title X would ultimately politicize the Federal Reserve in ways that would deeply undermine its effectiveness.

A remarkable aspect of the Title, especially from a Congress that claims it wants to reduce unnecessary regulation and red tape, is that it demands strict adherence to a policy rule, spelling out in detailed language a specific formula that the Fed's interest rate-setting committee must follow or face burdensome regulatory scrutiny.

This requirement is unworkable. If the FOMC strays from the "reference formula" in the Act, their rule change would be subject to nine separate burdensome requirements, many of which are onerous enough to make deviation from the rule impractical.

For example, within 48 hours of a policy meeting, the Fed Chair must, "include a function that comprehensively models the interactive relationship between the intermediate policy inputs."

She must, "include the coefficients of the directive policy rule that generate the current policy instrument target and a range of predicted policy future values for the instrument target if changes occur in any"—and then some.

And these are just two of the nine requirements. I have been studying monetary policy for decades, and I am not sure I know what some of these requirements mean. Again, this is an astounding read from a Congress that claims to be invested in reducing red tape and complex regulation.

My testimony also explains why a rule-based policy must be contrary to Title X applied with discretion. There are many variations to Taylor-type rules, all of which differ from the reference formula in the bill.

There are two unobserved variables in the rule, the equilibrium real rate of interest and the output gap. And I assure you economists are far from agreement on the optimal values to use in rule-based monetary policymaking.

Figure two from my testimony shows what I mean. Using real-time data, the Title X rule hits its low point in the fourth quarter of 2009 when it recommended a Federal funds rate that was negative 1.8 percent. Plugging in variants that mainstream economists endorse, however, generates a range of results from about negative 1 percent to about negative 7 percent.

Turning to fiscal policy, the other subject of today's hearing, in 2013 Fed Chair Ben Bernanke made the following statement to this committee, "Although monetary policy is working to promote a more robust recovery, it cannot carry the entire burden of ensuring a speedier return to economic health. The economy's performance both over the near term and the longer run will depend importantly on the course of fiscal policy."

There are at least three reasons why Mr. Bernanke was right about this. First, once the Federal funds rate hits zero, the Fed's firepower is constrained.

Second, monetary and fiscal stimulus attack different parts of the problem in weak demand constrained economies. Monetary stimulus works largely through lowering the cost of borrowing, but people hurt by high unemployment may have too little income to take advantage of low interest rates.

To the extent that fiscal stimulus puts money in people's pockets, say through infrastructure programs, direct job creation, temporary tax cuts, increased safety net benefits like ramped-up unemployment insurance, people are more likely to take advantage of low borrowing costs and to signal to investors through increased consumer demand that they too should take advantage of low rates.

Third, monetary and fiscal policies interact in recessions to boost fiscal multipliers. My testimony shows that before Congress prematurely pivoted to fiscal austerity, the one-two punch of fiscal and monetary policy was effectively pushing back on the Great Recession and slow recovery that followed.

I then document the high costs of fiscal austerity, including over a million jobs lost and the downshifting of GDP levels and growth through scarring effects. Thank you.

[The prepared statement of Dr. Bernstein can be found on page 34 of the appendix.]

Chairman BARR. Thank you, Dr. Bernstein.

And Dr. Selgin, you are now recognized for 5 minutes.

**STATEMENT OF GEORGE SELGIN, DIRECTOR, CENTER FOR MONETARY AND FINANCIAL ALTERNATIVES, THE CATO INSTITUTE**

Mr. SELGIN. Chairman Barr, Ranking Member Moore, and subcommittee members, in October 2008 the Federal Reserve began paying interest on bank's reserve balances with it. My testimony today concerns the economic consequences of that step.

The Fed was originally supposed to start paying interest on banks' reserves in 2011 to reduce the implicit tax burden reserve requirements placed on them. But as the 2008 crisis worsened, the Fed received Congress' permission to start paying interest on reserves immediately.

Its goal then was not to relieve banks of a required reserve burden, but to get them to hoard reserves it was creating by its emergency lending so that lending wouldn't result in increased bank lending and inflation.

To make interest on reserves serve this role, the Fed set the rate of interest on reserves above comparable market rates, where it has kept it ever since. The Fed thereby ignored the law's stipulation that the rate was, "not to exceed the general level of short-term rates."

As an anti-stimulus measure (note well) interest on reserves worked as expected. In fact, it worked so well that within weeks the Fed did an about-face. Now it hoped to stimulate the economy by purposefully creating large quantities of fresh bank reserves. All told, the three subsequent rounds of quantitative easing created another \$2 trillion of additional bank reserves.

Yet because reserves still paid an above-market rate of interest, banks just kept on accumulating them as they had done, and as the Fed had wanted them to do, before Q.E. when it was worried

about inflation. If insanity is doing the same thing over and over again but expecting different results, then I fear it must be said that some officials at the time were not quite in their right minds.

Although the Q.E. stimulus was disappointingly small, the Fed's actions had other big consequences. By acquiring trillions of dollars' worth of Treasury and mortgage-backed securities and borrowing from banks to pay for them, the Fed dramatically increased its footprint in the U.S. credit system.

Before interest on reserves and quantitative easing, bank reserves were less than 1 percent of bank deposits. Bank loans, in contrast, were almost 100 percent of bank deposits. Today, bank reserves are 20 percent of deposits and loans are just 80 percent of deposits. Before interest on reserves in Q.E. the Fed's assets were 7 percent of commercial bank assets. Today, that figure is 27 percent.

Commercial banks are expected to invest the public's deposits productively, subject to regulatory guidelines. Central banks are not. Central banks are tasked instead with regulating the scale of commercial bank lending and deposit creation. According to the Fed's own guidelines as set forth in a pre-crisis publication, it is supposed to, "Structure its portfolio and activities so as to minimize their effect on credit allocation within the private sector."

The reason the same guidelines state for this is, "that hard-earned experience shows that, in general, market directed resource allocation fosters long run economic growth."

In fact, there is vast economics literature on what is known as financial repression. The term refers to the harmful consequences of policies, mainly in less developed countries, that divert savings from commercial banks to central banks and thus from more to less productive uses. That literature blames such policies for much of the world's poverty.

The Fed's current operating system, with its above-market interest rate on reserves and bloated balance sheet, is very financially repressive. That is one reason for the continuing post-crisis productivity slowdown.

Yet the same system, far from at least improving basic monetary control, has prevented the Fed for 5 years running from meeting the 2 percent inflation target it set in 2012.

Distinguished subcommittee members, Chairman Barr, a central bank that cannot control inflation, and especially one that cannot make inflation go up, is a central bank that is unable to perform its fundamental duties.

To close, the Fed's new operating system based on above market interest on reserves has had disastrous consequences. Yet despite these results, the Fed's current normalization plan would keep much of the current arrangement in place. I hope for the general public's sake that Congress will not let that happen.

[The prepared statement of Dr. Selgin can be found on page 74 of the appendix]

Chairman BARR. Thank you, Dr. Selgin.

And the Chair now recognizes himself for 5 minutes.

I will stay with you, Dr. Selgin, I appreciate your testimony, particularly about interest on excess reserves and the associated risks with that as a primary monetary policy tool.

Dr. Selgin, what are the risks and downsides and the distortionary impacts of replacing conventional open market operations with interest on excess reserves as the primary monetary policy tool for setting the Fed funds rate?

Mr. SELGIN. The original means, before the crisis, by which the Fed managed the Fed funds rate was through open market operations, where it would adjust the quantity of reserves available to banks to change the rate at which they would lend to each other overnight, which is what we are referring to when we speak of the Federal Funds Rate.

That system worked while reserves were scarce and so long as it was worth more to banks to lend funds than to hold on to them as excess reserves, and it worked very well. It was the system that brought us the so-called great moderation of the 20 years roughly beginning in 1985.

In the new system, because banks under it aren't tempted to use their reserves but instead hold on to whatever comes their way, monetary tightening or monetary control consists of the Fed's adjustment of these administered interest rates, the interest rate on excess reserves and, lower down, the overnight reverse repo rate.

The problem with that system is, first of all, as I mentioned, the Fed has not succeeded using it in gaining the control of inflation we normally would want central banks to be able to exercise. It simply has not been able to meet the 2 percent target that it specified. And that is partly because it is hard to do that when you can't get banks to lend more by creating more reserves.

Under this arrangement, you have to rely on the so-called portfolio balance effect and other effects that work through tightening banks' demand for reserves or loosening that demand rather than by increasing reserves or changing the supply and having banks lend more or less.

But the other problem is that this new system requires that there be a substantial amount of excess reserves in the system. And that means that the Fed is, as I said, having a much larger role in credit allocation, and that means less productive use of credit.

Central banks are not designed to invest funds productively. They cannot make any loans to businesses, farmers, or consumers. So their portfolio is necessarily limited and that means that the use of funds, when they are commandeered by the Fed, is not going to be as helpful for economic growth.

Chairman BARR. Thank you.

And Dr. Levy, in Dr. Bernstein's testimony he made the argument that a Fed reform that has been proposed by this committee would involve over-regulation, over-regulation, in this case, of the Fed.

When I think of over-regulation, I think of Washington over-regulating actors in the private economy. I don't think of Washington trying to keep entities that are part of the Federal Government accountable.

And so regulating and holding accountable the Federal Reserve to a strategy-based policy that is transparent and accountable, I don't view that, as Dr. Bernstein does, as over-regulation.

Can you comment on that? And also, can you talk about the Fed's extension into credit policy as potentially contributing to the risk of fiscal inflation, and what the unconventional policies the Fed may need for the political independence of monetary policy?

Mr. LEVY. Yes. On regulation, it is the role of your committee to supervise the Federal Reserve. And I think the general thrust of the Financial CHOICE Act provides you more ability to properly supervise the Fed.

In response to issues about the Fed has to respond within 48 hours, the Fed has hundreds upon hundreds of very capable staff members who have already delved into all these issues.

They have already written up before the meetings their approaches to the issues. So I don't think it is asking too much of the Fed to respond to questions.

With regard to rules-based, you want to make the rules-based flexible and allow flexibility to the Fed to deviate from those rules under abnormal circumstances, such as during the financial crisis, but then use that as a framework for explaining to the committee why it deviated. So you want a rule, but you want it to be flexible.

Chairman BARR. Thank you. My time has expired. I appreciate your responses to those questions.

And the Chair now recognizes the distinguished ranking member of the subcommittee, Congresswoman Gwen Moore, for 5 minutes.

Ms. MOORE. Thank you so much. This is just the most amazing opportunity of my lifetime to be able to sit and listen to people with the level of expertise that all of you have brought here today, and I have more questions than I have time.

But let me start out with you, Dr. Bernstein, because I think you are sort of outnumbered here on the panel of experts. You said in your testimony that there was a high cost of fiscal austerity, and I would like you to flesh that out a little bit for us. You said that at the end of your testimony.

Mr. BERNSTEIN. Right. My testimony documents the impact on GDP growth, on jobs, on unemployment from a premature pivot to fiscal austerity endorsed by Congress starting around 2010, particularly in 2012, 2013 to be very specific.

Congress' failure to renew the payroll tax holiday took something like \$120 billion out of the economy at a time when the recovery was still slow to take off. And this led to the loss of about 1.5 percent of GDP, maybe around a million jobs, that would otherwise have occurred had Congress not made this pivot.

It is widely understood by economists that this type of premature pivot to fiscal austerity has been particularly damaging in Europe, where unemployment rates are still highly elevated.

We didn't bite off of as much of it as they did, but I present concrete examples of the damage this did to the economic lives of working families earlier in this expansion.

Ms. MOORE. I can tell you that the rest of the panelists have argued, particularly I think Dr. Levy, and I am going to get to him in a minute, about the importance of changing the entitlement programs lest we become too reliant upon them, in favor of doing other things.

And I guess I am curious as to what those things will be. But right now we are—the latest CBO report says that 32 million peo-

ple are going to be kicked off Medicaid. There are proposals to structurally change Medicaid.

We have seen our Speaker in the past talk about vulturizing Medicare, changing Social Security. What do you think the impact will be? Do you think this will solve our debt problem, I guess that is the narrative?

Mr. BERNSTEIN. Are you asking me?

Ms. MOORE. Yes.

Mr. BERNSTEIN. I think if the House, particularly Republicans, were interested in chipping away at the debt problem that Dr. Levy emphasized in his testimony they wouldn't be considering trillions of dollars of tax cuts that are unpaid for.

Ms. MOORE. Amen. Unpaid for wars, I appreciate that. In terms of—I am interested in the fiscal policy, the rules-based fiscal policy. What prevents smart people from gaming the system, Wall Street wizards, when we have a rules-based Fed?

First, Dr. Bernstein, and then maybe Dr. Selgin? Quickly?

Mr. BERNSTEIN. Okay. Quickly, I think that Dr. Levy was just saying that you want it to be stated you want a rules-based Fed, you want it to have flexibility.

I would argue very strenuously that is the antithesis of Title X in the CHOICE Act. There is a really strong attempt to undermine the Fed's discretion, and I think any objective reading of the rule would leave you with that impression.

Ms. MOORE. Dr. Selgin, why couldn't a wizard of Wall Street game the system with a rules-based approach? Go on, go for it.

Mr. SELGIN. Actually, it is the absence of rules that is easily gamed as it allows monetary policy to become a football that special interests try to influence—or Congress itself, for financing the deficit and any other number of reasons. And there is a long history of this kind of influence. A rule can be very flexible.

Ms. MOORE. It is an oxymoron to say you are going to have a rule and then it is going to be flexible.

Mr. SELGIN. Yes. Let me explain.

Ms. MOORE. They taught me that in algebra.

Mr. SELGIN. Rules can be designed so that they allow for reactions to all kinds of circumstances.

Ms. MOORE. Dr. Levy needs my last 20 seconds.

Mr. SELGIN. All right.

Ms. MOORE. How would you change the structure of the entitlements?

Mr. LEVY. I would look carefully at the structure of Social Security, look carefully at the replacement rates in them that haven't been looked at—

Ms. MOORE. Who would be the losers?

Mr. LEVY. —since the early 1980s to be fair and to protect older working people and phase things in in a logical way. On Medicare and Medicaid, this gets into very difficult, including ethical issues.

Ms. MOORE. You brought it up, I didn't. My time has expired.

Chairman BARR. Thank you. The gentlelady's time has expired.

The Chair now recognizes the Vice Chair of the subcommittee, Mr. Williams from Texas.

Mr. WILLIAMS. Thank you, Chairman Barr, and thank all of you for being here today.

Dr. Selgin, I wanted to talk a little bit about the Fed's plan to begin unwinding its balance sheet. I think in your testimony you call it a recipe for failure. Why is that? And how should the Fed proceed so that its normalization plan has a meaningful impact on the balance sheet?

Mr. SELGIN. Thank you. As I mentioned in my testimony, the Fed has for some years now failed to reach its inflation target. I believe its plan for normalization will only make it more likely to fail again and by a larger margin in the future.

The reason is that the plan the Fed has announced involves two things: shrinking the balance sheet, which is itself a tightening measure, of course; and raising the interest rate on excess reserves that I have been complaining about, in the next several years to over 3 percentage points, which is, of course, more than twice its current level. That is tightening as well. So you have a lot of tightening going on by a Fed that is already too tight, according to its own inflation target.

The Fed has also said, though, that if things get bad under its current normalization plan, it will consider abandoning the shrinking of the balance sheet it has announced, and may even turn to expanding it again.

This seems to me, all told, to be a recipe for failure. And I am sorry to have to say that I believe that the Fed is perhaps not all that keen on actually succeeding in becoming small again.

Mr. WILLIAMS. Okay. Thank you. Staying with you, I want to quote Mr. Bernanke. Of course, we have all heard him say, "Banks are not going to lend out the reserves at a rate lower than they can earn at the Fed."

Well, I am a borrower. I borrow all the time, and I can certainly appreciate a good rate. But the Fed's policy of giving above-market rates to banks that hold excess reserves that we have already talked about is troubling.

A couple of weeks ago, this subcommittee had a hearing called, "The Federal Reserve's Impact on Main Street, Retirees, and Savings." So in your opinion, how has this policy affected Main Street America, which I am and most of us are, and small businesses who want to gain access to capital, which is important in expansion?

Mr. SELGIN. Banks ultimately pick their portfolios, reserves, loans, whatever other assets they can acquire, so that the tendency is for them all to be worth the same amount at the margin, as we economists like to say.

When you make it more worthwhile for banks to hold reserves by raising the rate on reserves, and particularly when you raise that rate above comparable market rates, the first thing that happens is banks don't make any short-term loans. They pull out of the wholesale markets.

But in the long run, these adjustments include adjustments to other kinds of lending. And, in fact, that is why lending is now, as I said, about 80 percent of total bank deposits, whereas for years before the crisis, total lending and total deposits moved together. So that difference between 100 percent and 80 percent, there is your small town lending loss.

Mr. WILLIAMS. Along those same lines, you also talked in your testimony about removing inefficiencies—



Mr. SELGIN. Yes.

Mr. WILLIAMS. —and improving the environment for economic expansion. As it relates to our current debate on reforming the tax code, do you have any specific tax policy reforms Congress should focus on?

Mr. SELGIN. No, sir. I am not an expert on tax policy. I would be offering my private citizen's guesses on that subject, and I would rather not.

Mr. WILLIAMS. Less tax would be good though. You would agree with that, wouldn't you?

Mr. SELGIN. Well, if it were less for me, yes.

[laughter]

Mr. WILLIAMS. Thank you. All right. Dr. Levy, in your testimony, you state that sound monetary policy ultimately relies on sound fiscal policy. Many of us in this room continue to be concerned about the long-term implications that our national debt will have on future generations.

So you talk about monetary policy and government finances being interconnected. Can you go into greater detail on why policy-makers, i.e. Congress, should not continue to ignore our national debt, and what are the long-term consequences it could have on monetary policy?

Mr. LEVY. It is not just the deficit spending that increases the debt, it is what you are deficit spending for. When you look at how the budget has evolved, a large and rising share of it is being allocated toward income support.

A lot of that is good, but a shrinking portion is being allocated toward policies like infrastructure, job retraining, and research and development, that would add to long run productive capacity. Therefore, the increase in the debt and the allocation of the national resources, generated by the structure of the spending programs, is basically borrowing from the future and from future generations.

And so the problem you face is under current law, the policies, the tax policies, the structure of the spending policies will reinforce disappointing economic growth and only add to debt.

Chairman BARR. The gentleman's time has expired.

The Chair now recognizes the gentleman from Michigan, Mr. Kildee.

Mr. KILDEE. Thank you, Mr. Chairman. And to the panel, thank you so much for your testimony.

Dr. Levy, I would just like to pick up where Ms. Moore left off. She asked about specific structural changes in Medicaid/Medicare, Social Security. And I wonder, without going too deep, because I don't have a lot of time, if you could just give examples of what you mean by that, more specific examples of what you might mean by changes? And if you could just quickly identify changes in each of those three important programs?

Mr. LEVY. Social Security, you have to look at the internal structure of the benefits, what is called the replacement rate, which hasn't been changed in forever. You have to look at rates of return. People who are older and retire much earlier are getting extremely high rates of return on their Social Security contributions.

You should treat Social Security income as an insurance policy and tax the extent to which it exceeds your inputs.

By the way, I testified many decades ago, and encouraged the Congress to tax a certain portion of Social Security benefits, and that is happening. So you really need to look at the underlying structure.

Medicare and Medicaid are much more difficult. You start out with asking the question, why is the U.S. allocating about 18 percent of its GDP toward medical care without getting the results?

And you have to look at the structure of these programs, including, as I was starting to mention to Congresswoman Moore, you need to get into this ethical issue.

Are we appropriately allocating resources when so much of Medicare goes to the last 18 months of life, and in some cases, with very good examples, prolongs lives in ways that aren't positive. So—

Mr. KILDEE. Right. And, sir—

Mr. LEVY. —these are ethical issues. I understand. But if you really address the structure of the programs without just talking about big numbers and—we are a wealthy Nation. If we restructured these programs, there would be more than enough resources to insure the indigent, the poor, et cetera, et cetera.

Mr. KILDEE. I appreciate that. The difficulty that I am having, and you referenced it, and I would ask Mr. Bernstein to comment specifically on this, the frustration that I have is that, for a lot of folks, and this applies to both sides of the aisle, dealing with this question is sort of like in Washington like the weather. Everybody complains about it, but nobody ever does anything about it.

The issue that I am concerned about is where we seem to see a willingness, at least with this Congress, to push down on public investment.

It is in those areas where you would expect the greatest return, in the development of skills, in the kind of income support that is absolutely necessary to keep a family from completely tipping over and going into a tragic death spiral.

Mr. Bernstein, I wonder if you might comment on how you think the current budget proposals might impact both larger economic performance, but specific issues that relate to families and communities?

Mr. BERNSTEIN. I would underscore the points that you were beginning to get at there, Congressman. If you look at the part of the budget that is non-defense discretionary, that is actually where a lot of the functions that you are describing live. And I actually agree with Micky Levy's points.

So take education, for example. Take access to college. The budgets that Republicans and President Trump have been sending up, take those levels of funding, a share of GDP down to historical lows that we have never seen anything like before, lower than any point on record, going back to the 1960s when the modern data series begin.

Whether we are talking about infrastructure, education, childcare, helping people get back to work, investing in communities, that is where that lives. And just briefly on the social insurance programs, on Medicaid, Medicare, remember Social Security reduces elderly poverty from 40 percent to 9 percent.

About two-thirds of Social Security recipients depend on that income for half or at least half of their income. So this is a—the average benefit is \$16,400 a year. Okay? We are not talking about lavishing money on retired people.

So instead of chopping away at these programs, we should look at them as investments in our future. And I am afraid that the current budgets that we have seen go exactly in the opposite direction.

Mr. KILDEE. All right. Thank you. It seems that my time has expired.

I yield back. Thank you very much.

Chairman BARR. The Chair recognizes the chairman of our Capital Markets Subcommittee, Mr. Huizenga from Michigan.

Mr. HUIZENGA. Thank you, Mr. Chairman. And quickly, this isn't the main part of what I wanted to talk about, but Dr. Bernstein brought up Title X and his concerns. I think they are unfounded, being intimately involved with the creation of the FORM Act, which then was put into the CHOICE Act.

Page 503, Line 1, Subtitle C, Requirements for a Directive Policy Rule shall, and it goes through seven, eight, nine various things. Of that, it says, "The Fed needs to just describe what it is doing."

Down at number 6, it says that, "They need to include a statement as to whether the directive policy rule substantially conforms to the policy rule that they wrote, and, if applicable, A, an explanation to the extent in which it departs reference rule that, again, it wrote, not us; B, a detailed justification for the departure from the rule that it wrote; C, a description of the circumstances under which the directive policy may be amended in the future," that they wrote; and then "7, include a certification of the directive policy rules expected to support the economy in achieving stable prices and maximizing natural employment for long term."

For a body that created the Fed, I think it is completely applicable that they explain it. I have to move on, though, to Dr. Levy.

Mr. BERNSTEIN. But can we argue about that for a minute?

Mr. HUIZENGA. Well, no, because I have 3 minutes and 30 seconds to get to another point.

Mr. BERNSTEIN. It is going to—

Mr. HUIZENGA. But we can take that up—

Mr. BERNSTEIN. Let's take that up.

Mr. HUIZENGA. —at another time. Monetary policy, I believe Dr. Levy, you had said, "Monetary policy has stimulated fiscal markets, but has not stimulated economic growth." And I agree. And you later then said something about large pockets of underperformance versus meaningful and fair fiscal reforms.

That was in your opening statement. And we ran out of time. I wanted you to explain a little bit of that, because I have done research into my own district here.

My home county is at 2.6 percent unemployment. However, I have pockets, including in Muskegon County, which houses a place called Muskegon Heights, predominantly African American, about 10,00 people located within another city, where the official unemployment rate is in the low teens.

That is not U6 numbers. That is the official unemployment rate. I have the poorest county in the State of Michigan, Lake County, again, heavily minority.

I have the largest Hispanic district in the State of Michigan. And what we are seeing is those minority communities being left behind in unprecedented numbers compared to where the rest of the economy and society is accelerating.

And I think it is exactly as you were headed towards. Wall Street is doing just fine. If you are a qualified investor, an elite citizen, you are doing more than just fine.

If you are Joe and Jane IRA, you are struggling, because you are not able to get into it. And if you don't even have that investment account, you are really struggling. So I would like you to expound on that, please?

Mr. LEVY. Thank you. I give the Fed credit for the aggressive stimulus during the financial crisis and recession. That was 8 years ago. The effectiveness of its subsequent quantitative easing programs and low interest rates is highly questionable.

Since QE3 in the fall of 2012, and the implementation of forward guidance and sustained negative real policy rates, nominal GDP growth has decelerated. It has stimulated financial markets, it has not stimulated economic growth.

I emphasize that monetary policy is incapable of addressing some of the pockets of under-economic performance and underperformance in labor markets in your district and nationally. Those need to be addressed with the proper policy tools.

One of the critical points I emphasize is that if we identified the sources of the increase in debt and ask how can we restructure those while maintaining the intent of the programs? If we did that properly, that would free up resources for us to spend on areas like you have mentioned and in programs that would increase productive capacity.

And I think that is critically important. Congress and the Fed need to understand the proper roles of monetary and fiscal policies, identify the sources of our underperformance and frustrations about the economy and address them with the proper policy tools.

Chairman BARR. The gentleman's time has expired.

The Chair recognizes the gentleman from Illinois, Mr. Foster, for 5 minutes.

Mr. FOSTER. Thank you, Mr. Chairman. And thank you to our witnesses. I would like to quickly touch on one thing, which actually was the subject of a recent Wall Street Journal op-ed, talking about repealing the debt limit, in which a pair of very respected Democrats and Republicans made the case, and a number of interesting—well, besides just going over the history—they made the interesting point that at present the debt limit negotiations are being used by Democrats to increase spending, which is sort of contrary to the intent, certainly of Republicans who typically talk about and attempted to use it as a cap on spending.

And so I would first like to just ask anyone who would like to opine, whether this is a useful mechanism? It is often compared to refusing to pay your credit card after you have made the purchase, and that we would be much better off taking seriously the budget process and controlling the spending at the level of budget resolution and so on. And I wonder if any of you—Dr. Leeper?

Mr. LEEPER. Yes. I think that the debt limit is anachronistic and is almost counter-productive for what you want to do. It ends up

increasing uncertainty about fiscal policy. As you say, it gets used as a political tool in a variety of ways. I think you would be much better off if you were to adopt some clear fiscal objectives.

This is happening broadly in Europe now where they may pick a debt GDP ratio that they try to aim for. They may build in limits on spending that are bound by revenues and so forth. And I think what all of that does—

Mr. FOSTER. Sir, that is the point of a budget resolution. That is the way it should be properly enforced.

Mr. LEEPER. Let me just add one thing. I think one of the key points is that in a lot of these European economies, there is an outside entity that evaluates policy.

And the CBO, for all the good that it does do, can't play that role. And so there are these fiscal councils that I think actually have been very constructive in Europe.

Mr. BERNSTEIN. I think Eric's point about the anachronism is exactly on target. I think your point—and there is a great deal of confusion about this, that failing to raise the debt limit is failing to pay for spending that this body has already approved. And so it is much like saying I have decided not to pay for the meal I just ate.

But third, it was interesting, I think it was Mr. Davidson, I don't know if he is still here, earlier talked about the damage to the economy of uncertainty in our policy environment. Fooling around with the debt ceiling, which has become kind of unfortunately a Washington tradition, absolutely boosts that kind of uncertainty in a way that I would think this committee would consider to be anathema.

And I would also say the same thing, by the way, about healthcare. I can think of almost no way to further increase uncertainty in health insurance markets than by continually failing to nail down what it is this country wants to do with healthcare reform.

Mr. FOSTER. Yes, Dr. Levy?

Mr. LEVY. I think it would be much more constructive if Congress really reassessed its budget processes. What I have seen over the last couple of decades is what started out as identifying entitlement programs as entitlement versus discretionary programs that have to be appropriated through the appropriation committees every year.

This has evolved into entitlement programs are mandatory and then you have discretionary and non-defense discretionary. So as Dr. Bernstein noted, the current budget proposal for Fiscal Year 2018 really proposes significant cuts to non-defense discretionary programs.

And the reason why it does that is because the entitlement programs, which are mandatory, are just psychologically thought of to be off the table. And so I recommend really, really re-thinking the budget process rather than hanging your hat on the debt ceiling.

Mr. FOSTER. And one of the key elements that is missing in the U.S. budget process is something present in many parliamentary systems, which is that if you fail to pass a budget by a certain date, that forces, calls a new election. And if we had a mechanism like that, I think the dynamic would change.

Chairman BARR. The gentleman's time has expired.

The Chair recognizes the gentleman from North Carolina, Mr. Pittenger.

Mr. PITTENGER. Thank you, Mr. Chairman. And I thank each of you for being here today and for your expertise.

Dr. Selgin, we are 8 years out of the recession. In great measure, the American households and businesses have certainly not been able to climb back to their full economic potential.

We have the largest demographic group in the country, low-income minority people today. Is the Federal Reserve's accommodation of unsustainable fiscal policies and favoring some sectors over others in credit markets holding our economy back?

Mr. SELGIN. Yes, Congressman. As I said, to the extent that the Fed is shunting savings into the mortgage market, the market for mortgage-backed securities, and into the Treasury, which savings might be instead employed for productive bank lending where that includes not just lending to businesses but to farmers and consumers (because consumer lending is also productive or can be). To that extent, the Fed is constraining—its policies are a drag on economic growth.

We have always depended heavily on bank lending as one of the important contributors to economic growth. And even though it must be said that banks sometimes do very bad things when they are lending and we saw plenty of that in the last crisis, nevertheless, without robust bank lending policies we will have less economic growth. And that harms everybody.

Mr. PITTENGER. Thank you, sir.

Dr. Leeper, would you concur that unsustainable fiscal policies and favoritism of certain sectors work against what the Fed has fought so hard for throughout the history and that is monetary policy that is independent of the distributional politics?

Mr. LEVY. Yes, I generally agree. And the best—oh, was I supposed to—

Mr. PITTENGER. Dr. Leeper, I asked him but I will ask you to comment.

Mr. LEVY. Oh, I apologize.

Mr. PITTENGER. That is all right.

Mr. LEVY. I am truly sorry.

Mr. LEEPER. I guess that I have a somewhat different view about this. Whether we want to call what the Fed did fiscal policy or not seems fairly arbitrary. The point of my testimony was that monetary policy always has fiscal implications.

And so, do we want to say that, and what I mean by “that,” is that it has implications for tax and spending policy. And so by that definition, we could say that everything the Fed does is fiscal policy.

So I am not sure that I see that as a useful label. But beyond that, I think that the biggest issue that is happening now is take what I was saying about when the Fed tries to reduce inflation by raising interest rates and turn it on its head.

It is a symmetric argument. So when the Fed reduced the funds rate dramatically and kept it near zero for many years, the kind of fiscal backing that was necessary for that to have beneficial effects on the economy was to run higher deficits.

And while there was the ARRA, that petered out and it is not clear that the fiscal backing that the Fed needed for that interest rate policy to be effective was forthcoming or that people expected it would be forthcoming.

Mr. PITTENGER. Thank you.

Dr. Levy, you are welcome to respond?

Mr. LEVY. I agree with Dr. Leeper, and let me just add this point that the Fed's holdings of mortgage-backed securities has clearly stepped over the boundaries into credit allocation, and maybe we could legitimize it, the purchases during the height of the financial crises.

A week after the Fed started QE1, Chairman Bernanke stated, "This is an extraordinary emergency measure and we are going to unwind it on a timely basis." Well, they haven't unwound it. It has even gotten bigger.

The Fed shouldn't be involved in credit allocation issues, and I think their strategy to unwind its portfolio should go much further to go back to an all Treasuries portfolio.

Mr. PITTENGER. Thank you, my time has expired.

I yield back.

Chairman BARR. The gentleman from Texas, Mr. Green, is recognized.

Mr. GREEN. Thank you, Mr. Chairman, and I thank the witnesses as well. Mr. Chairman, I have been here long enough to remember when the contention was that Q.E. was going to create runaway inflation. The contention now seems to be that Q.E. has been the reason for our not having the inflation that we have targeted.

I can also remember when we had this theory presented to us of expansionary fiscal contraction. And that expansionary fiscal contraction was going to be the means by which we would save the world.

Let's just examine some of this, and I would like to talk to Dr. Bernstein, if I may? Dr. Bernstein, expansionary fiscal contraction contemplates layoffs, contemplates cuts, and to a certain extent does not allow for the infrastructure projects needed at a time when the country could afford them, when interest rates were low. It didn't allow for that.

And my friends who are pushing expansionary fiscal contraction don't seem to think that has an impact on economic policies that are perpetuated, perpetrated, if you will, by the Fed. These things work hand-in-hand.

So Mr. Bernstein, if you would, talk for just a moment about how the impact of expansionary fiscal contraction to the extent that my colleagues have engaged in it and they have done everything that they can it seems to me to cut and gut—the infrastructure programs haven't come online. Would you talk for just a moment about it?

Mr. BERNSTEIN. What you are calling expansionary fiscal contraction, I called austerity measures, and in fact, aptly described these would be contractionary fiscal measures.

Simply by that definition, an increase in government spending increases GDP. That is arithmetic. However, there are many moving parts. And the Federal Reserve, if they believe the economy is

too close to full employment, will offset fiscal stimulus at times like that.

The quote that I presented in my written and spoken testimony was Ben Bernanke coming to this body a few years ago when the expansion was proceeding at too slow a pace, saying, “not only will the Federal Reserve not increase interest rates to offset fiscal stimulus, but it will use it as complementary.”

We have seen in Europe the damage that fiscal austerity has done to growth when the pivot deficit consolidation has occurred too soon, and we have seen it in this country as well. It is one of the reasons why it took so long for the output gap to close. And in fact it has barely closed now 8 years into the expansion.

Mr. GREEN. And if you would, explain to us some of the things that could have been done that would have complimented the Q.E. of the Fed?

Mr. BERNSTEIN. I think the most important types of fiscal complements would have been in the area of infrastructure investment, increased unemployment insurance compensation at a time when the job market wasn’t where it is now, when the job market was still having trouble closing in on full employment.

And I thought the payroll tax holiday, as I show in my testimony, I have a graphic of the impact of GDP shaved about one and a half points off GDP in 2013 by prematurely ending what we called the payroll tax holiday.

I do want to make one quick other point if I may, which is that there has been a considerable amount of criticism of some of the work that the Federal Reserve was doing in this period. Eric said earlier something to the—George said something early to the effect that the Fed had an increased footprint in the credit system.

In 2008, and I often think that we do have some economic amnesia around these points, the credit system was completely shut down.

Mr. GREEN. If you would let me just assist you with this, it was shut down to the extent that banks wouldn’t lend to each other. That is pretty significant. Continue.

Mr. BERNSTEIN. So the Federal Reserve simply was manifesting its role of lender of last resort in the way that the Congress created it precisely to do so. Now, we can have arguments about how quickly they have unwound.

I think it was interesting to hear Dr. Levy say that the housing market is booming and then be so critical of the MBS program. There is no question either in my mind or in the research that I would be happy to share with the committee that those two phenomena are related.

Mr. GREEN. Let me make one quick point. We have had CEO salaries increase greatly. Last year, the number one person on the top 10 CEOs in terms of salaries had about \$98 million as a salary, a 499 percent increase.

Question for you, increasing the minimum wage, the impact of that, please, on the economy?

Chairman BARR. Quick answer. The time has expired, so a quick answer.

Mr. BERNSTEIN. Moderate increases in the minimum wage consistently have their intended effect of boosting the earnings of low-



wage labor diminishing the inequality you are talking about without substantial job loss effects.

Mr. GREEN. Thank you.

Mr. Chairman, I yield back.

Chairman BARR. Thank you. Time has expired.

The Chair recognizes the gentlemen from Arkansas, Mr. Hill.

Mr. HILL. Thank you, Mr. Chairman. And thank you for this continuing set of hearings on monetary policy and fiscal policy today. I appreciate having such a distinguished panel joining us. I appreciate everyone's time and your excellent testimony.

We have talked about fiscal policy and monetary policy, the topic of the hearing, but I would like to raise another constraining factor I think was at work during this period, which I would like, maybe, Dr. Levy for you to start out with. And that is the non-monetary policy structural impediments of our regulatory system and how, I think, that has constrained growth to some degree.

We have talked a lot about across the economy, not just the Dodd-Frank Act, this is not a Dodd-Frank comment, but labor market regulation, environmental regulation. These all were on the upswing during this contractionary period where we were trying to get the economy growing again.

But certainly in the credit allocation aspect, Dodd-Frank did have an impact on certain aspects of credit and not making it flow as well. Would you address sort of that administrative state of non-monetary policy, non-fiscal policy aspect of constraint on growth?

Mr. LEVY. Yes. I believe that one of the factors that has led unprecedented monetary ease not to stimulate the economy has been some of the inhibiting factors on both aggregate demand and supply and production due to the growing web of regulations that you mentioned not just on the Federal level, but on the State and local levels in the non-financial sectors.

The list goes on. It is expanding and what it does as well, the Fed has been very, very successful through its policies to lower the real cost of capital.

Businesses, when they think about investment projects and hiring, they think about the regulatory environment, the current and expected tax environment, and their hurdle rate for taking on projects stays very high and they put a wide band of uncertainty about it. So I think these are definitely having an impact on the non-financial sector.

It is also clear that the implementation of portions of Dodd-Frank, particularly the stress test and some of the micromanagement, is clearly affecting banks' willingness to lend, so both in the financial and non-financial sector.

Mr. HILL. Yes.

Mr. LEVY. I think this regulatory environment is very, very important.

Mr. HILL. I appreciate that—

Mr. LEVY. It has slowed potential growth and it has inhibited the Fed's policies from working.

Mr. HILL. Thanks. That is my view as well. I think it is a good area for research for our Ph.D. community to really look at that both in labor policy and financial allocation policy.

Dr. Selgin, let's talk about the balance sheet. Governor Powell has laid out a long-term normalization process for the Fed. And to me that is very important, and we were at about 6 percent or so of GDP in terms of Fed size.

We got up. We are up around 24 percent of GDP. Chair Yellen was here, and she talked about, "Well, we are not ever going to go back to kind of where we were," but if we look at 6 percent or 8 percent of GDP for total Fed balance sheet footings, that would be, I don't know, a trillion to a trillion four up from, say, \$900 billion before the crisis.

Do you see any reason for the Fed balance sheet to be larger than where it was in the range before the crisis?

Mr. SELGIN. Yes, there is a reason, but it isn't a reason for it to be as large as they are planning to make it when they are done with normalizing. And the reason is the Fed is the sole supplier of currency. If we allow for the trend of currency growth to that extent, the balance sheet today would have to be bigger than it was in 2000.

Mr. HILL. What about as a percentage though? Do you see—

Mr. SELGIN. Oh, I'm sorry. As a percentage, no—

Mr. HILL. —that is why I am saying between a trillion and a trillion four would be the same.

Mr. SELGIN. I apologize. As a percentage of GDP, there is no reason. I would like to address Dr. Bernstein's remark about the footprint. Let me be clear. The reason the wholesale markets shut down in October 2008 was because the Fed purposely shut them down using interest on excess reserves. It wanted to keep its loans from spilling into the wholesale market.

You cannot celebrate the Fed for saving the wholesale market in the banking system when in fact it did the opposite. I quite agree that it should have been a hero, but it wasn't. It was the villain in this story, and even if it was justified in expanding its balance sheet back then, it certainly isn't justified 8 years afterwards, 9 years afterwards.

Mr. BERNSTEIN. I guess I would just ask, what about the housing bubble?

Mr. SELGIN. What about the housing bubble?

Mr. HILL. I yield back, Mr. Chairman.

[laughter]

Chairman BARR. Time has expired.

The Chair recognizes the gentlemen from Minnesota, Mr. Emmer.

Mr. EMMER. Thank you to the Chair, and thanks to this fantastic panel for this discussion.

Dr. Levy, You were talking—it just interested me this morning when you said, "Sustained monetary easing has failed to stimulate the economy. In fact, what it has done is it has stimulated financial markets, but hasn't stimulated economic growth." And then you commented that, "Fiscal policy has created this huge debt."

And your testimony is that both need to be reset. You think the Fed should be more aggressive in the unwinding, was your other piece. Could you just comment on that?

Mr. LEVY. Certainly.

Mr. EMMER. Its balance sheet is what you were talking about.

Mr. LEVY. Certainly. For a variety of reasons, the Fed's maintaining a \$4.5 trillion economy, over \$2 trillion is basically at sitting as excess reserves. The banks are not lending it out, so—

Mr. EMMER. I understand that. I don't mean to interrupt, but I want to keep this on track because what I am going at is Chair Yellen has suggested kind of a 5-year. When you talk about aggressive, what do you think should be done? Is that the right timeline? Should it be shorter?

Mr. LEVY. I actually think 4 or 5 years is just fine because then most of it could be unwound in a passive way. They wouldn't have to sell it. It could just unwind through amortization, but I do take issue with the Fed on a critical point.

It should be going back to an all Treasuries portfolio. Yes, the Fed subsidies of the mortgage market are helping housing, but that bids up prices of housing. And it is high-income people who own housing, and it also bids up rental prices and exerts duress on low-income people.

Mr. EMMER. Yes. Dr. Leeper, I was interested when I read your testimony before the hearing today. You go back to the 1930s, and you talk about what those of us who don't have your background, but we are just from Main Street, USA, and not from the coasts, we already think the Fed has hurt its credibility.

And, quite frankly, the government, because of a story that you tell with President Roosevelt, where he changed monetary policy purposely because he was going to inflate the currency and reduce his debt, our debt, I guess. But you talk about this unwinding. We have a big problem as we raise interest rates. How do you do this and survive?

Mr. LEEPER. I think that is a very good question, and my feeling about that is for you to understand that through that fiscal channel, in other words, if the Fed starts to normalize interest rates and debt service rises and Congress doesn't respond by adjusting taxes or spending to accommodate that, those increases in interest rates are likely to end up in higher inflation rather than lower inflation.

Mr. EMMER. Right.

Mr. LEEPER. And so understanding the nature of those interactions is what it is about.

Mr. EMMER. And you may not be able to control that.

Mr. LEEPER. Right.

Mr. EMMER. This is the issue we had.

Mr. LEEPER. It is within your control, because you control the budget.

Mr. EMMER. I understand that, but once this gets away from them, that is what they are desperately trying to maintain is make sure that—you want a certain amount of inflation, but you can't have it run away.

And by the opposite side, if you do the wrong things, you could encounter deflation, which would be every bit as damaging. Dr. Selgin, why don't you talk about that a little bit. Address how we get out of the place that we are in?

Mr. SELGIN. Sir, what we need to do is to get back—

Mr. EMMER. And by the way, Dr. Selgin, the one thing I do want to ask you, because I get this mixed testimony is, what has the

Federal Reserve done in the last 3 decades that has worked? Let's reduce it. What have they done in the last decade that has worked, sir?

Mr. SELGIN. In the last decade?

Mr. EMMER. Yes.

Mr. SELGIN. Oh, not much. Not much.

Mr. EMMER. Can you point to anything that—

Mr. SELGIN. As I said, the problem is the Fed undermined its own operating mechanism with this interest on excess reserves policy. It put the monetary transmission mechanism, as we call it, in neutral. It steps on the gas, nothing happens.

Mr. EMMER. Right.

Mr. SELGIN. Reserves pile up. The Fed is its own worst enemy as far as being able to affect total spending in the economy and control inflation, because of policies it implemented in 2008. It has wrecked its own transmission.

It did it at first because it was worried about inflation. Now, with the same setup in place, it can't get the inflation it wants. This is not surprising really.

Yes, quantitative easing had some effect, but much less than it would normally have had because the reserves were made to pile up in banks. I don't want to say that the Fed has never had some relatively-sound policies, but I do say that the change in their monetary control mechanism implemented since the crisis has been a disaster. We need to go back to the old control—

Chairman BARR. Your time—

Mr. SELGIN. —mechanism or something not too dissimilar from it.

Chairman BARR. —has expired.

Mr. SELGIN. And that is the key.

Chairman BARR. Thank you.

Mr. BERNSTEIN. Chairman Barr, could I make, let's say, one sentence?

Chairman BARR. The time has expired, and—

Mr. BERNSTEIN. Okay.

Chairman BARR. —and Mr. Sherman may give you that opportunity.

And I now recognize the gentleman from California, Mr. Sherman.

Mr. SHERMAN. I have my own questions. I am looking up at that debt clock, quantitative easing raised—Mr. Bernstein maybe you have the number. I believe it was many tens of billions of dollars for our country last year, that is to say the amount the Fed turned over to the Treasury. Do you happen to have the figure?

Mr. BERNSTEIN. Off the top of my head, \$500 billion cumulatively.

Mr. SHERMAN. Well, not all in 1 year.

Mr. BERNSTEIN. No, no. I am talking about—

Mr. SHERMAN. Dr. Levy, do you have the 1-year number?

Mr. LEVY. The Fed remitted in Fiscal Year 2015, \$117 billion. That number has come down to about 85, largely because of the amount it has the raised rate, so it has paid excess reserves.

Mr. SHERMAN. So we have a debt clock up there, and we would be hundreds of billions of dollars higher if the Fed had not remitted the money.

And we are told that we have a disaster. We have one of the longest periods of time with economic growth quarter after quarter. The number I have for 2016, by the way, is \$92 billion, which is very close to what Dr. Levy had to say.

We are told that we can't get the job-producing benefits of low interest rates for too long under too many different circumstances, otherwise, we will have inflation.

Dr. Bernstein, is inflation a big problem?

Mr. BERNSTEIN. No. First of all, the remittances I was talking about were cumulative, so about \$100 billion a year over the last 5 years or so is off the top of my head.

Mr. SHERMAN. Yes.

Mr. BERNSTEIN. No. And let me just correct the record. I think you would be very hard-pressed to find an economist from any side of the aisle who would assert as strongly as George just did that the Fed played no role in helping to offset the damage of the Great Recession.

We can have really good nuanced arguments, and we are having those arguments today, about how effective it was and the roll-offs and things like that. But the Federal Reserve was, in my view, and I have evidence in my testimony—

Mr. SHERMAN. Dr. Bernstein, let's go to the benefits of the Fed giving \$100 billion to the United States Treasury. I am told by those in the field, that this is extraordinary, not, shouldn't be the real focus of things. It is just \$100 billion. Do not pay attention to it because the Fed has other objectives. And I am looking at a debt clock.

And to me, \$100 billion a year is not something I am going to ignore just because the tradition in the field is to ignore it, and say that is not the objective. The objective should be the \$100 billion. What would we do to turn it into \$200 billion? Please don't miss the goal.

Mr. BERNSTEIN. These remittances have certainly been important. They are a residual—

Mr. SHERMAN. Dr. Bernstein, I asked you a question. What would we do to—

Mr. BERNSTEIN. We would have to increase the level of the Fed's balance sheet. And, in fact, they are going in the other direction, obviously.

Mr. SHERMAN. And they know they are going the other direction, because we had Janet Yellen in here tell us, "Oh, that isn't important. That isn't our mission. That is not what we focus on."

I am looking at the debt clock. I don't know what they focus on. I don't know what—you can't focus on it because you would have to turn around, but I am focused on it, and it—

Mr. BERNSTEIN. I—

Mr. SHERMAN. —was put up there by the Majority.

Mr. BERNSTEIN. I am well aware of what the debt clock is ticking away there.

Mr. SHERMAN. Why shouldn't we give a very high priority to hundreds of billions of dollars?

Mr. BERNSTEIN. Because you have to ask yourself, is increasing the Fed's balance sheet the right monetary policy right now? Now, you can go—

Mr. SHERMAN. No. Okay. That—

Mr. BERNSTEIN. You can make the case—

Mr. SHERMAN. There are tremendous benefits from that as a monetary policy now.

Mr. BERNSTEIN. There have been many more benefits than my colleagues on the panel have acknowledged. And, in fact, I was just looking at—

Mr. SHERMAN. Without that policy, we wouldn't have as flat a debt curve.

Mr. BERNSTEIN. Yes.

Mr. SHERMAN. We wouldn't have as much investment in the economy. Property values would decline—

Mr. BERNSTEIN. But if I—

Mr. SHERMAN. Jobs would decline.

Mr. BERNSTEIN. Yes.

Mr. SHERMAN. People would go hungry, and that debt clock would be going faster.

Mr. BERNSTEIN. Those are—

Mr. SHERMAN. So exactly what is bad with a bigger balance sheet again?

Mr. BERNSTEIN. First of all, let me just say that if this body really wanted to get that debt clock going in the other direction, then we wouldn't be looking at budgets that continually pursue trillions of dollars of unpaid-for tax cuts. To me, it is the fiscal policy—

Mr. SHERMAN. Dr. Bernstein, this is the Financial Services Committee. If I wanted to get on Ways and Means, I should have cut a different deal.

Again, what—oh, okay. So we could—

Mr. BERNSTEIN. Okay. So if your point is—

Mr. SHERMAN. So let me just—wait. If we enlarge the balance sheet, we can slow that debt clock and instead of doing what the Fed is doing, which is taking away the \$100 billion, we could add another \$100 billion in debt relief. I don't know whether Dr. Levy is going to be called on or not, but—

Chairman BARR. The gentleman's time has expired.

And in addition to the debt clock, we have another clock that we are focused on, and that is the clock of the remaining time to vote. We are going to clear these last two Member's questions, and then we are going to have to adjourn.

The gentleman from Ohio, Mr. Davidson, is recognized.

Mr. DAVIDSON. Thank you, Mr. Chairman.

And thank you to our witnesses. I really appreciate your testimony. And I note that as is normal in these hearings, we hear folks from the other side of the room talk about this period of austerity. It is occasionally that we have a witness on the panel also reference austerity.

And I just want to ask you, Dr. Leeper, does the trend that we have been on since 2010 represent a period of austerity fiscally?

Mr. LEEPER. I think that what we have done is very much what lots of other countries have done, which is, in response to the crisis we did a fiscal stimulus, and then we immediately began to wring

our hands and talk about how don't worry about this fiscal expansion, because we are going to contract.

Within 6 days of passing the ARRA, President Obama was pledging that he was going to reduce deficits by half.

Mr. DAVIDSON. Right.

Mr. LEEPER. I think this is very confusing to people.

Mr. DAVIDSON. Yes. So thanks. And I take a little bit of exception with the idea that somehow my reality of the small business guy not having confidence in Congress or the Fed, to be somehow we need to provide certainty in the market. Certainty is something I will talk about in a bit.

Certainty of bad outcomes is not a good thing. Certainty of good outcomes is great. And when you look at the markets, in the year, you talk about Obama, there was some doom and gloom. There was a lot of uncertainty. There was a lot of regulatory uncertainty.

And with the change of Administration, what you have seen is still some uncertainty, but a lot more confidence—a 3-year high in business confidence, the markets are rallying, because people believe there is going to be a change. I would say the simple answer is no, that does not represent austerity. It represents an awful lot of spending.

If I could go the next slide on mine, I cycled it a bit ago to show, this is the net result of all of the tax revenue we collect and all of the money that we spend. This year, we are on a path to spend roughly \$700 billion more dollars than we collect.

Unfortunately, at the start of the year, the plan was to continue on this path. As Herb Stein said, and I referenced earlier, "If something can't continue, it will eventually stop."

Dr. Selgin, when will this no longer be sustainable? When will it stop? This is the uncertainty we are all looking for.

Mr. SELGIN. I once again defer to the others. That is not my expertise. I have heard a million predictions about this, and I don't dare say which, if any of them, is correct.

Mr. DAVIDSON. Dr. Levy, would you like to comment?

Mr. LEVY. The answer is, nobody knows when things become unsustainable. I want to hit on a critical point you made, Congressman Davidson, this term, "austerity." I will just ask in lay terms, how can you say the budget is austere, when year after year you are spending more than you are taxing?

And I might note, the European example was used earlier. The austerity in Europe hurt those economies because 80 percent of the budget deficit reductions were through tax increases that harmed economic activity.

So I think we need to think seriously about, once again, what we are deficit spending for? And can we achieve the intent of those programs, but just restructure them so that they are more efficient? But the bottom line is, the answer to your question is that nobody knows.

Mr. DAVIDSON. But no one knows precisely when. We just know that it is not possible. So if you look at our debt-to-GDP ratio, as the slide that I started out on, that is not sustainable. At some point we see what happened in Greece. I don't have their slide. Eventually, people lose confidence in our debt market.

And in fact, part of the reason that the Fed's balance sheet grew is we didn't have a place for some of the debt to go. No one had confidence to buy the assets, in this case, mortgage-backed securities, and it would triple the macroeconomy if we didn't do something. That was the fear.

You could do something. Was it the right thing? It seems to have worked so far. I think it is unconventional, and we should have changed course. We are unwinding it, and as we are unwinding that, my time is unwound. So I would love to talk to you more, but my time has expired.

Mr. Chairman, I yield back.

Chairman BARR. The gentleman yields back.

The Chair recognizes the gentleman from Indiana, Mr. Hollingsworth.

Mr. HOLLINGSWORTH. Hearing my colleague talk, I am often reminded of that old adage when somebody was asked how they went bankrupt: slowly at first, and then suddenly. And so, like you said, no one knows when it might happen, but it might happen suddenly.

And I would like to welcome all the panelists here, but certainly, Dr. Leeper, who comes from the most beautiful district in the country, I like to say, Indiana's Ninth District, and I appreciate you being here.

Reading through your testimony, one of the things that I wanted to talk about was the combination of unwinding the balance sheet at the Federal Reserve and large fiscal deficits that are expected to expand over the next couple of years during that 5-year period and just the amount of capital that it going to soak up and what that implies for crowding out investment in the private sector and other issues? And kind of just share your general views on the combination of those, too?

Mr. LEEPER. Oh, wow. I actually would like to think about these separately—

Mr. HOLLINGSWORTH. Okay.

Mr. LEEPER. —to tell you the truth. No doubt there will be some interactions, but I don't think that it is something that we understand terribly well.

My points about the interactions between monetary and fiscal policy are really independent of the size of the Fed's balance sheet. That the magnitude of the Fed's balance sheet per se doesn't affect, for example, how much—

Mr. HOLLINGSWORTH. I guess it is hard for me to recognize—

Mr. LEEPER. —interest payments—

Mr. HOLLINGSWORTH. Right. So as they shrink the balance sheet, private capital is going to have to come in to fund the rolling over of those Treasuries.

And then in addition to that, new Treasury issuance on account of current deficits, the combination of those two gets to be a pretty sizable amount of capital that is going to fund deficits and fund previous deficits that used to be held at the Federal Reserve.

Mr. LEEPER. Yes, but there doesn't seem to be any shortage of demand for Treasuries.

Mr. HOLLINGSWORTH. Today.

Mr. LEEPER. Well—



Mr. HOLLINGSWORTH. Yes, which kind of gets to my question about—

Mr. LEEPER. Yes. Today, but a lot of that demand is coming from overseas.

Mr. HOLLINGSWORTH. Right.

Mr. LEEPER. So I don't think there is any reason to think that there is going to be a huge crowding out that occurs during the unwinding.

Mr. HOLLINGSWORTH. Okay. One of the other things that we have talked about several times in committee, and you have heard it here today, is interest on excess reserves.

Now, Chair Yellen has made the frequent argument that the Fed itself is incapable of controlling the Fed funds rate without paying this interest on excess reserves. Is that something that you believe or buy into?

Mr. LEEPER. As a matter of public policy, I have yet to hear a persuasive argument for paying above-market rates on excess reserves.

Mr. HOLLINGSWORTH. Great. Fantastic. And then one of the other things I wanted to talk to you about, and I certainly know the dual mandate that the Fed has right now, but just clean slate, what is your view on maybe an increasing academic literature around targeting nominal GDP or nominal GDP growth versus a dual mandate of price stability and full employment?

Mr. LEEPER. That is a good question, and I think it cuts on—

Mr. HOLLINGSWORTH. Finally found one.

Mr. LEEPER. I think it cuts on the issue of whether the Fed ought to be held accountable to a Taylor Rule or something like that.

Mr. HOLLINGSWORTH. Right.

Mr. LEEPER. What the academic literature tells us is that something like an inflation-targeting rule or a nominal GDP rule is actually far superior to a Taylor Rule. And the reason for that is Taylor Rules can instruct the Fed to do strange things, depending on what shocks hit the economy.

Mr. HOLLINGSWORTH. Right.

Mr. LEEPER. So, for example, if you get a spike to oil prices—

Mr. HOLLINGSWORTH. Transient price shocks, yes.

Mr. LEEPER. It raises prices and it lowers output, and the Taylor Rule is going to tell the Fed to contract.

Mr. HOLLINGSWORTH. Right.

Mr. LEEPER. And so, whereas if you have an inflation-targeting rule—

Mr. HOLLINGSWORTH. Right.

Mr. LEEPER. —you would be able to avoid that kind of instruction.

Mr. HOLLINGSWORTH. For clarity, in the previous legislation that we passed out of this committee, the Taylor Rule is frequently talked about. There is no specific rule that is demanded, but just a more rules-based monetary policy regime.

The second piece that I wanted to ask about, and my colleagues might be annoyed at the number of times I ask about this, but something I am increasingly concerned about is the relationship between full employment and wage growth and how anemic wage growth has been despite, I guess, approaching full employment.

And something that I worry about is that—in fact, the Phillips curve turns out to be nonlinear or might be nonlinear, and we might be approaching a time period where the Fed will be far behind the curve, because they have pushed full unemployment and pushed unemployment lower and lower, only to find ourselves now behind the curve as the part of the Phillips curve that is nonlinear begins to take over.

Is there something to worry about there? Is that something that some of the academic literature has talked about and been concerned about?

Mr. LEEPER. I think there is nothing to worry about there.

Mr. HOLLINGSWORTH. Okay.

Mr. LEEPER. I don't think there has ever been a time when there was a stable relationship between unemployment and inflation, and there certainly are likely to be nonlinearities.

Mr. HOLLINGSWORTH. Yes.

Mr. LEEPER. But the idea that suddenly inflation is going to shoot off, I think is really nothing to be concerned about.

Mr. HOLLINGSWORTH. Wonderful. Well, thank you so much for being here and for traveling all the way from Indiana. I yield back.

Chairman BARR. The gentleman yields back. And I would like to thank our witnesses for their testimony today.

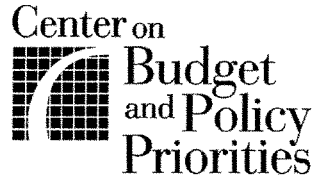
The Chair notes that some Members may have additional questions for this panel, which they may wish to submit in writing. Without objection, the hearing record will remain open for 5 legislative days for Members to submit written questions to these witnesses and to place their responses in the record. Also, without objection, Members will have 5 legislative days to submit extraneous materials to the Chair for inclusion in the record.

Thank you all for your excellent testimony today. This hearing is now adjourned.

[Whereupon, at 11:16 a.m., the hearing was adjourned.]

# **A P P E N D I X**

July 20, 2017



820 First Street NE, Suite 510  
Washington, DC 20002

Tel: 202-408-1080  
Fax: 202-408-1056

center@cbpp.org  
www.cbpp.org

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## **The Critical Importance of an Independent Central Bank**

### **Testimony by Jared Bernstein, Senior Fellow, Before the House Committee on Financial Services: Subcommittee on Monetary Policy and Trade**

Chairman Barr and Ranking Member Moore, thank you for the opportunity to testify today.

My testimony begins with a discussion of Title X of the Financial CHOICE Act, which would undermine the independence and flexibility of the Federal Reserve, one of the few national institutions that has, in recent years, worked systematically and transparently to improve the economic lives of working Americans. By aggressively rolling back necessary financial oversight, much of the rest of the CHOICE Act would be an act of economic amnesia, one that would raise the likelihood of a return to underpriced risk, bubbles, bailouts, and recession — while Title X of the Act would hamstring the central bank's ability to respond to the problems engendered by the rest of the Act.

My testimony also makes the following points:

- The evidence shows that monetary policy as practiced by the Federal Reserve, while not perfect, significantly boosted jobs and growth in the Great Recession and the recovery that followed, without generating market distortions.
- While monetary policy was often helpful in terms of pulling forward the current expansion, fiscal policy, starting around 2010, was uniquely austere and counter-productive, leading to job loss and a weaker expansion.
- There are policy measures that could be pursued to help those left behind in the current economy, including both monetary and fiscal policies. In the latter case, however, policies in budget plans from President Trump and House Republicans, along with the repeal of the Affordable Care Act, would hurt, not help, disadvantaged workers.

### **The Impracticalities and Dangers of an Overly Rules-Based Federal Reserve**

It is widely recognized across advanced economies that for central banks to be most effective in carrying out their mandates, they must be politically independent. Of course, the Federal Reserve must meet the broad mandates Congress legitimately sets for it, which in the U.S. case is aptly summarized as full employment at stable prices. But any micro-managing of how the Fed meets its

mandates by those who hold political office raises the specter of politicizing the bank's actions. As current Fed chair Janet Yellen recently wrote, the "framework" wherein the Fed independently pursues its statutory goals "is now recognized as a fundamental principle of central banking around the world."<sup>1</sup>

Title X of the Choice Act (this title was formerly the stand-alone Fed Oversight Reform and Modernization Act of 2015) would violate this critical norm.

A remarkable aspect of Title X is that it demands strict adherence to a policy rule, spelling out, in detailed language, a specific formula that corresponds to economist John Taylor's 1993 eponymous "rule" and insisting that the Fed's interest-rate-setting committee, the Federal Open Market Committee (FOMC), follow this rule in setting the federal funds rate (FFR) or face burdensome regulatory scrutiny.

The formula is specified as follows:

$$\text{FFR} = \text{inflation} + 0.5 * (\text{output gap}) + 0.5 * (\text{inflation} - 2\%) + 2\%$$

The "output gap" is specified as the percent deviation between actual and potential GDP, and inflation is the year-over-year rate of price growth. The first 2% is the Fed's inflation target; the second is the variable that is these days called  $r^*$ , which stands for the real interest rate at full employment and stable inflation that is neither expansionary nor contractionary.

To be clear, my objection is not to the utility of this rule, which is a sensible and intuitive formula (and a very important contribution to monetary policy). It essentially says that when inflation is above the Fed's target the FFR should go up, and when output is below potential, the FFR should come down. When inflation is on target and output is at potential, the formula says the real FFR (nominal FFR – inflation) should be 2%, which is close to its long-term average (though I will soon show great variance around that average).

Its simplicity, along with the fact that certain versions of the rule generally track the actual movements in the FFR, makes the Taylor rule a standard tool for monetary policy makers. One of the first questions a monetary economist might ask in assessing the stance of Fed policy is, "where is the FFR relative to the Taylor rule?" However, while this might well be the first question, it should definitely not be the last.

For one, to say that the rule describes the past means neither that past rates were optimal nor that the rule's output is appropriate for current or future conditions, a limit Taylor himself recognized in his seminal 1993 paper.<sup>2</sup> Therein, he noted that, to complement the information summarized in policy rules, central bankers needed to analyze "... several measures of prices (such as the consumer price index, the producer price index, or the employment cost index) ... expectations of inflation as measured by futures markets, the term structure of interest rates, surveys, or forecasts from other analysts. . . ." Importantly, Taylor argued in that same paper that "there will be episodes where monetary policy will need to be adjusted to deal with special factors." One such factor — the zero lower bound on the FFR — is particularly germane in this context.

Advocates of Title X might well inject at this point that the Act allows for such flexibility, but I strongly disagree. As I read the text of the bill, any time the FOMC strays from the "reference formula" specified in the Act (or a different version of the Taylor rule that had been previously

sanctioned by the elaborate review process I'm about to describe), their rule change would be subjected to *nine* separate requirements, many of which are onerous enough to make deviation from the rule impractical.<sup>3</sup>

For example, within 48 hours of an FOMC policy meeting, the Fed chair must “describe the strategy or rule of the Federal Open Market Committee for the systematic quantitative adjustment of the Policy Instrument Target to respond to a change in the Intermediate Policy Inputs” (these are the variables in the rule). She must “include a function that comprehensively models the interactive relationship between the Intermediate Policy Inputs.” She must “include the coefficients of the Directive Policy Rule that generate the current Policy Instrument Target and a range of predicted future values for the Policy Instrument Target [the FFR] if changes occur in any Intermediate Policy Input.” And those are just three of the nine Title X requirements.

It is an astounding read from a Congress that claims to be invested in reducing red tape and complex regulation. It also creates a strong bias towards a solely rule-based approach that is, for reasons I now explain, increasingly unwise.

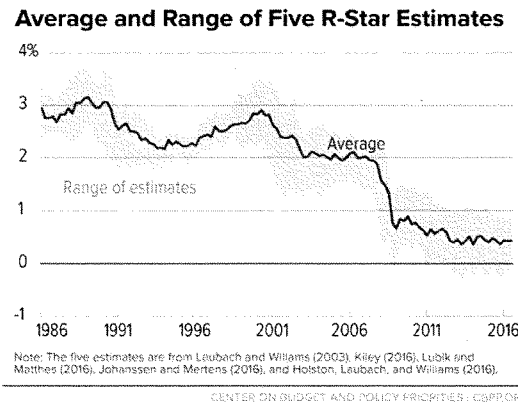
### The Challenge in Identifying the Taylor Rule

Taylor's work is important and justly influential. I assure the committee, however, that every single parameter in the Taylor Rule equation is fraught with uncertainty and questioned by the economics community. Note that:

- **There isn't consensus on the best inflation gauge.** Taylor recommended the GDP deflator, but many contemporary applications of the rule use the PCE deflator, often the core version (excluding food and energy prices), as the Fed believes core PCE inflation to be the best predictor of future price growth.
- **It's unclear whether the coefficients should be 0.5.** Former Fed Chair Ben Bernanke, in a recent piece that explores these very questions, argues that the coefficient on the output gap should be 1, not 0.5, as this formula more closely tracks the path of the FFR over the past few decades (Fed Chair Yellen has also made this point).<sup>4</sup> Researchers at the Kansas City Fed agree that “the equal weights on inflation and the output gap in the Taylor rule may not always be appropriate. While equal weights might be well suited for supply shocks, a greater weight on the output gap may be better suited for demand shocks.”<sup>5</sup> And recall that under Title X, the Fed would have to justify any such changes to their regulator at the Government Accountability Office (GAO).
- **The output gap requires the input of unobserved variables that are increasingly difficult to nail down.** The first such variable is potential GDP, meaning the level of GDP at full resource utilization, or, alternatively, the “natural” rate of unemployment, meaning the lowest jobless rate believed to be consistent with stable inflation. There is considerable disagreement as to both the level of potential GDP and the natural rate of unemployment. Moreover, economists can only estimate these values these days within a wide confidence interval, meaning the formula above conveys a false sense of certainty. One recent analysis estimates that the current natural rate of unemployment is between a range that goes from 0 to 6 percent.<sup>6</sup>

- **The level of another key unobserved variable in the rule, the “neutral” real FFR, is also a source of controversy among economists.** This value is set at 2% in Taylor’s formula and in the “reference formula” of Title X (as noted, this variable is called  $r^*$ , or  $r^*$ ). But recent estimates of  $r^*$ , such as those in Figure 1, show it to vary considerably over time, with some recent results near zero.

FIGURE 1



- **The Fed’s explicit inflation target is 2%. But there is ongoing and increasing dissent on this point**, with many economists now arguing that the Fed should raise its inflation target, in part because it would mitigate the risk of the FFR getting stuck at the “zero lower bound.”<sup>7</sup> Just last week, Chair Yellen recognized that this risk is greater than it has been in the past, pointing out “... that the economy has the potential where policy could be constrained by the zero lower bound more frequently than at the time when we adopted our 2% [inflation target].”<sup>8</sup> While Yellen noted that raising the target would engender both benefits and costs, to her credit, she clearly entertained the possibility that raising the inflation target could be necessary.
- **The Fed must work with real-time data**, which they must be able to informally adjust if known biases exist. For example, recent first-quarter GDP growth has appeared to be biased down, perhaps due to problems with seasonal adjustment. Failing to account for this bias could exaggerate the output gap. Pushing in the other direction, the unemployment rate has at times in recent years been biased down due to labor force exits, which in a rule-based approach could return a higher FFR that would itself be biased up. Under Title X, every time the Fed wanted to make adjustments to known biases, it would have to justify the adjustment to regulators at the GAO.

Table 1 takes these issues into account and presents results from many different versions of Taylor rules for two time periods, the depth of the Great Recession and now. First, note the sensitivity of the rule to the variable choices discussed above. Using real-time data that was available

at the time, the rule as written in Title X hits its low point in the fourth quarter of 2009, when it recommended an FFR that was -1.8 percent. Switching to the core PCE deflator and plugging in an  $r^*$  of zero takes the rule-based FFR to -2.8 percent (see row 2). Upweighting the slack coefficient leads to an FFR of almost -7 percent. If we stick with the “reference formula” but use unemployment instead of the GDP output gap, we get outcomes ranging from -0.6 to -4.1 percent. The range of results for these examples is shown in Figure 2.

TABLE 1

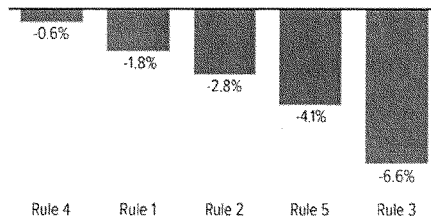
Rule No.	A Surplus of Taylor Rules	Low during Great Recession	Now
1	Standard Taylor Rule	-1.8%	3.4%
2	(1) but with PCE core; $r^* = 0\%$	-2.8%	1.1%
3	(2) but with slack coef = 1	-6.6%	0.6%
4	(1) but with $u - u^*$ instead of GDP gap	-0.6%	4.0%
5	(3) but with $u - u^*$ instead of GDP gap	-4.1%	1.7%
N/A	Actual FFR	0.0%	1.25%

Source: Author's analysis of data from the Federal Reserve, Bureau of Economic Analysis, Congressional Budget Office, and Ben Bernanke

FIGURE 2

#### Taylor Rule Outcome Is Sensitive to Variable Choices

Federal funds rate under different Taylor Rules (using real-time data), 2009 Q4



Source: Author's analysis of data from the Federal Reserve, Bureau of Economic Analysis, Congressional Budget Office, and Ben Bernanke

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The differences in these results have huge policy implications. The Bernanke/Yellen Feds were running variants of these rules during the recession, and they appeared to lean towards the versions that bumped up the slack coefficient and plugged in a lower  $r^*$ . Given the zero lower bound on the FFR, results like those in the table motivated them to turn to a set of other policies intended to lower longer-term interest rates, discussed in the next section of this testimony.

Turning to the second column in the table, the Title X reference formula returns an FFR of over 3 percent, which is at the high end of the range that current FOMC members forecast to be the long-run, equilibrium nominal rate that they will get to post-2019. By this measure, the current Fed



is currently way “behind the curve.”<sup>9</sup> However, plugging a lower  $r^*$  and weighting slack more heavily returns FFRs closer to the Fed’s current path.

This wide array of results raises numerous strong objections to the rules-based approach. First, the discretion of the Fed’s economists is essential in deciding which values to plug into the formulas. They should not have to consult regulators, as Title X would require them to, each time they tweak something. Second, they must have the leeway to decide how much weight to give the formula’s output given other economic and data dynamics. Consider today’s economy, where the job market is tight but wage growth is not accelerating and inflation has been *decelerating*. Though the standard rule would call for rapid removal of monetary accommodation, doing so would be incautious from the perspective of low- and middle-wage workers.

The combination of portentous choices to be made and politics is also a highly toxic mix, which is precisely why we do not want Congress micromanaging the Fed. The Fed is an independent, highly functional institution without an explicit political agenda; as such, it can go about its work in a much more analytical and less fractious political environment than that of today’s Congress. As a result, its approach is systematic, timely, and generally predictable, the last of which is important to markets.

Congress, conversely, is both much more political and less efficient. Partisan debates frequently cause deadlines to be moved back or missed. It would be an act of willful denial to not consider the problem of relative functionality — that of the Fed vs. Congress — when considering reducing the Fed’s independence and increasing Congress’s authority over their actions.

To be clear, none of that is to imply that the Fed’s monetary policy record is perfect, or that it doesn’t make costly mistakes. The Fed must not be immune from scrutiny and criticism; in fact, I myself recently administered a heavy dose.<sup>10,11</sup> But that’s a far cry from giving Congress the power to reduce the central bank’s independence and effectiveness.

### The Fed’s Large Scale Asset Purchases, a.k.a. Quantitative Easing

In late 2008, when the FFR first began bumping up against the zero lower bound and the economy was still very weak, the Fed announced that they would soon begin large-scale asset purchases, or LSAP, also known as quantitative easing, or QE. The purpose of this initiative, which involved the purchase of Treasury bonds and mortgage-backed securities (MBS), was to lower the cost of borrowing by targeting longer-term interest rates. How successful was the LSAP program and what, if any, costs did it impose on markets?

In a review of many studies of the impact of the LSAP on longer-term yields, John Williams finds that the asset purchases had “sizable effects on yields on longer-term securities,” but that the precise magnitudes of the effects were hard to tease out of the data.<sup>12</sup> That said, Williams notes:

The central tendency of the estimates [of the LSAP] indicates that \$600 billion of [the] Federal Reserve’s asset purchases lowers the yield on ten-year Treasury notes by around 15 to 25 basis points. To put that in perspective, that is roughly the same size move in longer-term yields one would expect from a cut in the federal funds rate of 3/4 to 1 percentage point.

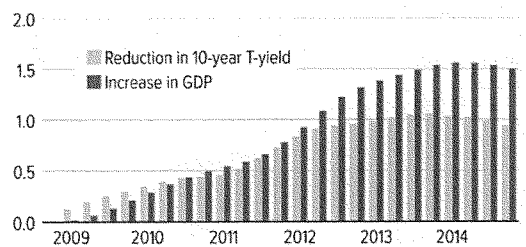
A simple statistical comparison of the impact of Fed rate changes on real GDP growth suggests a one-point decline in the FFR raises real GDP by about half-a-percent about 4-6 quarters later.

Consistent with that result, Williams reports on research that finds the Fed's LSAP program lowered the unemployment rate by one-quarter of a percentage point, which in today's labor market amounts to 400,000 jobs. Alan Blinder and Mark Zandi, using a macro-model to score QE against a baseline with no such intervention, estimate that from 2009-14, QE lowered the 10-year Treasury rate by 1 percentage point and raised the level of real GDP by 1.5 percent (see Figure 3).<sup>13</sup>

FIGURE 3

### Quantitative Easing Lowered Rates, Supported Growth

Cumulative percentage point change in key variables



Sources: Federal Reserve, Moody's Analytics

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As noted above, part of the Fed's LSAP program involved purchasing MBS backed by the government-sponsored enterprises Fannie Mae and Freddie Mac. These asset purchases were intended to "reduce the cost and increase the availability of credit for the purchase of houses" at a time when the damage from the bursting of the housing bubble was constraining credit and thus economic activity in that critical sector.<sup>14</sup> While assessing the impact of the Fed's MBS purchases is not simple, as many moving parts are in play, numerous analysts found that the program worked quickly to lower mortgage rates and help boost the ailing housing market.

Hancock and Passmore found, for example, that the Fed's MBS purchases lowered mortgage rates by "roughly 100 to 150 basis points," which they attribute to both the announcement of a "strong and credible government backing for mortgage markets" and the actual purchases themselves. They also report on other research, which finds "evidence of substantial announcement effects for the program, with estimates for the decline in interest rates ranging from 30 basis points to slightly over 100 basis points."<sup>15</sup> John Williams of the San Francisco Fed has argued that the MBS purchases were the "most effective" part of the Fed's asset purchase programs and that they "ended up having kind of the bigger bang for the buck than the Treasury purchases."<sup>16</sup> Blinder and Zandi's research underscores these findings. They report that, "within a short time" of this part of the LSAP initiative, "homebuyers with good jobs and high credit scores could obtain mortgages at record low rates, which helped end the housing crash."<sup>17</sup>

The empirical evidence thus suggests that QE should be viewed as a useful tool when the FFR is constrained by the ZLB, though estimates of its impact are imprecise. However, a number of

critiques have been offered against QE, and any potential downsides must be weighed against its benefits.

First, some critics worried QE would be highly inflationary. Yet the path of actual inflation has been consistently below the Fed's 2 percent target rate, so that critique is easy to dismiss.

Second, some have argued that, by inflating asset values, and considering that financial assets are disproportionately held by the wealthy, QE exacerbated wealth inequality. The closest examination of this assertion is by economist Josh Bivens, who finds the claim to generally be ill-founded. First, and most importantly, any inequality-inducing impacts of QE must be weighed against the distributional impact of the benefits of monetary stimulus.<sup>18</sup> As Bivens puts it, "Stimulus that reduces unemployment disproportionately benefits low- and moderate-wage workers and leads to a compression of earnings." Second, as the discussion of MBS above implies, QE made home loans more affordable, and Bivens notes that housing "is also the most democratically held asset across wealth classes." Cogent arguments can be made that there are types of fiscal stimulus that are more progressive than LSAP, but as I stress below, there were periods in our recent history when needed fiscal stimulus was not forthcoming, and against this baseline of no positive fiscal impulse, Bivens correctly notes that, as long as the economy and the job market are below potential, "monetary stimulus is a strongly progressive policy."

Third, some believe QE distorted financial markets by, for example, crowding out private investment in Treasuries and allocating too much credit to real estate. This critique too must be considered in the context of what else might have happened if the Fed had "given up" once the FFR hit the ZLB. Blinder and Zandi produce some of the most detailed analysis of such counterfactuals, modelling the impact on GDP, jobs, and unemployment of the policies to offset the last recession. Their "financial policy response" analysis goes beyond Fed policy, including the TARP and other credit enhancing programs. But presumably, all such interventions are relevant to those who object to alleged financial market distortions.

To try to isolate the impact of the financial system interventions, their counterfactual assumes no policy steps were taken to "shore up the financial system," but fiscal policies, such as the Recovery Act, were implemented. They find that in 2014, the financial policy interventions had these effects:

- Real GDP was 5 percent higher than it otherwise would have been;
- The level of payroll employment was 4 million jobs above the alternative;
- The unemployment rate was 6.2 percent compared to the counterfactual level of 8.4 percent.<sup>19</sup>

It is incumbent on those making market-distortion arguments to show that avoiding such distortions would have been worth sacrificing these sorts of gains.

Another factor to consider against this critique is that the rules governing which securities the U.S. Fed can purchase are actually quite restrictive. As is by now widely known, the LSAP expanded the Fed's balance sheet by over \$4 trillion through purchases of Treasury bonds and MBS. Why did the Fed not allocate credit more widely, so as not to unduly influence yields in just these two asset classes? Because they had no choice (according to their read of their charter, at least). This restriction is unique among modern central banks: the banks of England, Japan, Canada, and

Europe all have few restrictions on the types of assets they can purchase (though in some cases they must seek permission from regulators to go into, for example, equity markets).

Moreover, given actual market conditions at the beginning of the LSAP program, MBS purchases were warranted. Following the bursting of the housing bubble, private mortgage lending was severely constrained; even clearly credit-worthy borrowers in the prime market faced unusually tight lending standards. Given the private-sector's pull-back in housing finance, the case for crowding-out distortions is weak. To the contrary, as the Fed is the "lender of last resort" in a credit crisis, its MBS purchases were well-timed and, as shown above, had their desired impact (with the caveat regarding the challenge of precise estimation).

In sum, the Fed's LSAP was a necessary and helpful response to the deep recession of 2007-9. QE lowered longer-term interest rates, perhaps most importantly by delivering credit to the market for housing finance, at a time when the Fed's short-term interest rate tool, the FFR, was bound by zero. Again, any claims of negative externalities must be evaluated against the benefits documented above.

Of course, as the economy closes in on full employment, the Fed has now officially announced its intentions to reduce its balance sheet by allowing matured loans to roll off (instead of rolling them over). However, they may want to consider one further potential benefit of their historically large balance sheet, one raised in recent work by former Fed governor Jeremy Stein *et al.* These authors document the increase in the demand for short-term debt, a demand typically met by overnight "commercial paper" — very short-term debt instruments that can be prone to dangerous volatility with big, systemic downside risk. By maintaining an historically large balance sheet (perhaps about half the size of their current holdings), Stein *et al.* argue that the Fed can provide much safer short-term debt, thereby weakening "the market-based incentives for private-sector intermediaries to issue too many of their own short-term liabilities."<sup>20</sup>

This interesting and practical idea underscores my main recommendation to the committee regarding the Fed's bond-buying program: when their main tool is tapped out, the central bank must be able to turn to other methods to boost the economy on behalf of businesses and households. Restrictions on these practices would be, like the extreme rules-based approach discussed above, a major mistake.

### **The One-Two Punch of Monetary and Fiscal Policy and the Dangers of Fiscal Austerity**

While monetary policy in its various forms was highly effective in pushing back against the Great Recession, it takes both monetary *and* fiscal policy, working together, to generate a robust recovery. In fact, when he was Federal Reserve chair, Ben Bernanke made precisely this point in congressional testimony:

Although monetary policy is working to promote a more robust recovery, it cannot carry the entire burden of ensuring a speedier return to economic health. The economy's performance both over the near term and in the longer run will depend importantly on the course of fiscal policy.<sup>21</sup>

There are at least three reasons for Bernanke's assertion. First, while the LSAP had positive impacts as just described, once the FFR hits zero, the Fed's firepower is constrained, especially given persistently lower interest rates in recent years (as reflected in Figure 1). Constrained potential for monetary stimulus raises the relative importance of fiscal stimulus.

Second, monetary and fiscal stimulus attack different parts of the problem in weak, demand-constrained economies. Monetary stimulus works largely through lowering the cost of borrowing, but people hurt by high unemployment may have too little income to take advantage of low interest rates. Relatedly, investors may see too little demand to take on new projects. To the extent that fiscal stimulus puts money in people's pockets, say through infrastructure programs, direct job creation, temporary tax cuts, or increased safety net benefits (e.g., ramped up unemployment insurance), low- and middle-income people themselves can be more likely to take advantage of low borrowing costs, or to signal to investors through increased consumer demand that they should take advantage of low rates.

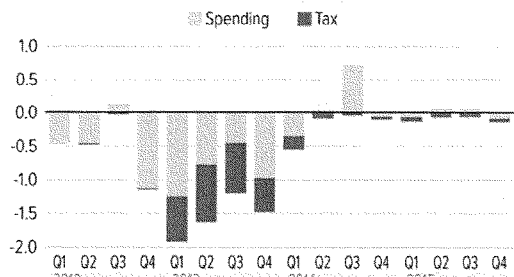
Third, monetary and fiscal policies interact in recessions to boost fiscal multipliers. If the economy is operating at full employment and government spending generates a positive fiscal impulse, the Fed may be likely to offset such spending by raising rates (this logic is consistent with the Taylor rules laid out above). But, as Bernanke's comment above suggests, in a recession or weak recovery (note that the comment is from February of 2013), the Fed would not move to offset a positive fiscal contribution to growth. It is partly for this reason, per Blinder and Zandi's analysis, that the "bang" for a dollar of fiscal stimulus is larger in recessions or weak recoveries. They estimate, for example, that each \$1 boost in food stamps in 2009 would have been expected to raise GDP by \$1.74, compared to \$1.22 in 2015; comparable multipliers for state fiscal aid are 1.41 in 2009 versus 0.58 in 2015.<sup>22</sup>

In fact, as Figure 4 shows, Bernanke had good reason to importune Congress for fiscal austerity — the reduction of fiscal support when private-sector demand is still too weak to support the needs of working families — in 2013. The bars show how much federal spending and tax decisions are estimated to have reduced GDP; the blue parts that year largely refer to the premature sunsetting of the "payroll tax holiday" that was helping to boost workers' paychecks, while the yellow parts represent spending cuts driven by "sequestration." As I've noted in prior testimony, the reduction shown (of 1.6 percentage points that year) cost us "over a million jobs lost based on historical relationships and about three-quarters of a point added to unemployment — at a time when the U.S. economy was still trying to recover from the residual pull of the Great Recession."<sup>23</sup>

FIGURE 4

### Congress' Fiscal Decisions Reduced Growth

Effect of federal fiscal policy on real GDP growth by type of policy in percentage points, 2012-2015

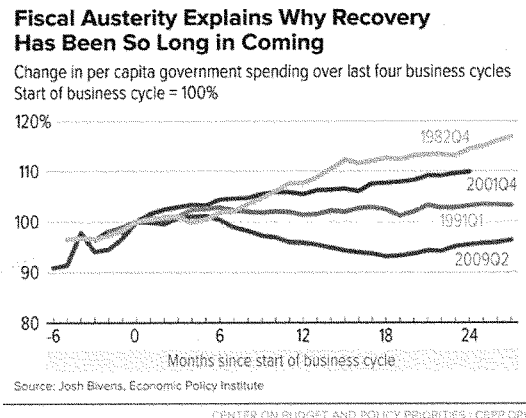


Source: Goldman Sachs Economics Research

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Another way to gauge the extent of budget austerity in recent years is to compare real, per-capita government spending across historical recoveries. Figure 5, from economist Josh Bivens, shows spending at all levels of government — federal, state, and local. Bivens notes that “...per capita government spending in the first quarter of 2016 — 27 quarters into the recovery — was nearly 3.5 percent lower than it was at the trough of the Great Recession. By contrast, 27 quarters into the early 1990s recovery, per capita government spending was 3 percent higher than at the trough, 23 quarters following the early 2000s recession (a shorter recovery) it was 10 percent higher, and 27 quarters into the early 1980s recovery it was 17 percent higher.”<sup>24</sup>

FIGURE 5



Combining the evidence in these figures with that of earlier sections suggests that it was fiscal, not monetary, policy that failed working people. Throughout the Great Recession and weak recovery, the Fed aggressively applied the tools at its disposal to pull the recovery forward and to try to offset the sharp demand contraction. Initially, from about 2009-10, stimulative fiscal policy was broadly complementary to that of the Fed, but shortly thereafter, fiscal impulse — the difference in fiscal support from one period to the next — turned negative, leaving the Fed to, in Bernanke’s words, “... carry the entire burden of ensuring a speedier return to economic health.”<sup>25</sup>

The costs of this damaging shift to austerity include the job losses (relative to a baseline where the fiscal impulse remained neutral) implied in Figure 4, but there is an even steeper cost as well. By prolonging the weak expansion and contributing to longer-term un- and underemployment than would otherwise have prevailed, austere fiscal policy likely triggered some degree of “hysteresis.” That is, cyclical damage from the last recession has likely led to a permanently lower level of real GDP relative to the pre-recession trend.

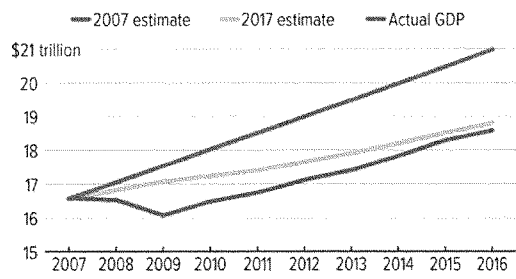
Figure 6 shows that CBO’s estimate of potential GDP is lower now than before the last recession. The gap in real dollars between today’s actual GDP and CBO’s downgraded potential, which it has just about caught up to, amounts to about \$225 billion, or around \$2,000 per household in the U.S.

Slower trend economic growth and weaker productivity growth, both of which preceded the downturn, are likely partially responsible, but this downward revision is also certainly suggestive of scarring effects. Austere fiscal policy, by prolonging economic weakness, contributes to lasting economic losses.

FIGURE 6

### GDP Output Gap Persists

Congressional Budget Office estimates of potential GDP in 2016 dollars, 2007-2016



Source: Analysis of Congressional Budget Office and Bureau of Economic Analysis data

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### Conclusion: What Would Helpful Fiscal and Monetary Policy Look Like Today?

As we enter year nine of the current expansion, there are steps that both monetary and fiscal policy makers can and should undertake.

Too often, congressional policies assume that all someone has to do to get a job is to want a job. But we know that, even as the U.S. economy closes in on full employment, labor demand remains weak for disadvantaged workers in various parts of the country. Measures to help those left-behind families include:

**Targeted, direct job creation (fiscal):** Direct job creation can take various forms. At the more interventionist end of the spectrum, the federal government provides a public service job for which it pays salary and benefits. Such employment could exist in fields ranging from infrastructure to education to child and elder care. A less interventionist approach is for the government to subsidize someone's wage in a public, nonprofit, or private-sector job, an approach that was taken during the Great Recession — through the Temporary Assistance for Needy Families Emergency Fund (TANF EF) — and was quite successful, creating around 250,000 jobs. One careful study from TANF EF in Florida found that, relative to a control group, participants' work and earnings went up not just during the program, but after it as well, suggesting lasting benefits.<sup>26</sup> A broader review of such programs shows we've done a lot more of this sort of job creation than is commonly realized, and well-designed programs in this space generate a big bang for the buck.<sup>27</sup>

In an effort to operationalize a direct job creation program, Ben Spielberg and I recommend that policymakers provide a dedicated funding stream (an “employment fund”) that can support job creation efforts and expand when and where the economy is weak.<sup>28</sup> Such a program would provide job creation for those left behind even in good times (whether due to discrimination, weak demand, or skill mismatches) and play a countercyclical role during recessions.

**Targeting higher inflation or the price level (monetary):** As noted above, economists increasingly recognize the risk of hitting the zero lower bound on the FFR. Having the Fed raise their inflation target or target the price level is increasingly regarded by economists as ways to avoid the recurrence of the lower bound problem.<sup>29,30</sup> Establishing, for example, a 4 percent inflation target as opposed to the current 2 percent target would lead to higher nominal interest rates in recoveries, putting more distance between the nominal FFR and zero. Second, higher inflation implies lower real interest rates if we again do hit the lower bound (at an FFR of zero, the real interest rate is the negative of the inflation rate). Advocates of price-level targeting argue that requiring monetary policy makers to make up for periods of below-target inflation with above-target inflation would avoid the lower bound and, at the same time, clearly signal the Fed’s preferred inflation path. Of course, switching to a new target or to level targeting would not be costless, but any potential costs must be weighed against the potential for avoiding the lower bound problem and thus maintaining stable growth and unemployment targets.

While both these fiscal and monetary policy interventions would help address the economic concerns facing many Americans today and offset future periods of weak or recessionary growth, it is worth underscoring my fundamental conclusion that, in today’s hyper-partisan climate, the Federal Reserve remains a highly functional and efficient institution. I thus strongly urge the committee not to impose any sort of micromanagement over the Fed, as Title X of the Financial CHOICE Act would do. Of course, given the Fed’s influence in the domestic and global economies, their decisions and actions should be scrutinized by Congress and outside observers. But maintaining the operational independence of the central bank must remain one of this committee’s higher priorities.

<sup>1</sup> Janet Yellen, Letter to Paul Ryan and Nancy Pelosi, November 16, 2015, <https://www.federalreserve.gov/foia/files/ryan-pelosi-letter-20151116.pdf>.

<sup>2</sup> John B. Taylor, “Discretion versus policy rules in practice,” Carnegie-Rochester Conference Series on Public Policy 39, 1993, pp. 195-214, <http://web.stanford.edu/~johnhtayl/Papers/Discretion.PDF>.

<sup>3</sup> H.R. 10 – Financial CHOICE Act of 2017, <https://www.congress.gov/115/bills/hr10/BILLS-115hr10eh.pdf>.

<sup>4</sup> Ben S. Bernanke, “The Taylor Rule: A benchmark for monetary policy?,” Brookings Institution, April 28, 2015, <https://www.brookings.edu/blog/ben-bernanke/2015/04/28/the-taylor-rule-a-benchmark-for-monetary-policy/>.

<sup>5</sup> Pier Francesco Asso, George A. Kahn, and Robert Leeson, “The Taylor Rule and the Practice of Central Banking,” Federal Reserve Bank of Kansas City, February 2010, <https://www.kansascityfed.org/publicat/reswkpap/pdf/rwp10-05.pdf>.

<sup>6</sup> Jared Bernstein, “Important new findings on inflation and unemployment from the new ERP,” On The Economy, February 22, 2016, <http://jaredbernsteinblog.com/important-new-findings-on-inflation-and-unemployment-from-the-new-erp/>.

<sup>7</sup> “Prominent Economists Question Fed Inflation Target,” Center for Popular Democracy, June 8, 2017, <http://populardemocracy.org/news-and-publications/prominent-economists-question-fed-inflation-target>.

<sup>8</sup> “Yellen Excerpt: Still ‘Highly Focused’ on 2% Inflation,” MNI Washington Bureau, June 14, 2017, <https://www.marketnews.com/content/yellen-excerpt-still-highly-focused-2-inflation>.



<sup>9</sup> “Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy, June 2017,” Federal Open Market Committee, June 13-14, 2017, <https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20170614.pdf>.

<sup>10</sup> Jared Bernstein, “Why the Federal Reserve should not raise rates in June,” *Washington Post*, June 2, 2017, [https://www.washingtonpost.com/posteverything/wp/2017/06/02/why-the-federal-reserve-should-not-raise-rates-in-june/?utm\\_term=.aca51f399a45](https://www.washingtonpost.com/posteverything/wp/2017/06/02/why-the-federal-reserve-should-not-raise-rates-in-june/?utm_term=.aca51f399a45).

<sup>11</sup> Jared Bernstein, “Is the Fed fighting an old war?,” *On The Economy*, June 15, 2017, <http://jaredbernsteinblog.com/is-the-fed-fighting-an-old-war/>.

<sup>12</sup> John C. Williams, “Monetary Policy at the Zero Lower Bound,” Brookings Institution, January 16, 2014, <https://www.brookings.edu/wp-content/uploads/2016/06/16-monetary-policy-zero-lower-bound-williams.pdf>.

<sup>13</sup> Alan S. Blinder and Mark Zandi, “The Financial Crisis: Lessons for the Next One,” Center on Budget and Policy Priorities, October 15, 2015, <https://www.cbpp.org/research/economy/the-financial-crisis-lessons-for-the-next-one>.

<sup>14</sup> Press Release, Board of Governors of the Federal Reserve System, November 25, 2008, <https://www.federalreserve.gov/newsevents/press/monetary/20081125b.htm>.

<sup>15</sup> Diana Hancock and Wayne Passmore, “Did the Federal Reserve’s MBS Purchase Program Lower Mortgage Rates?,” Federal Reserve Board Finance and Economics Discussion Series, January 2011, <https://www.federalreserve.gov/pubs/feds/2011/201101/201101pap.pdf>.

<sup>16</sup> Jeanna Smialek, “Fed’s Williams Prefers MBS Buying to ECB Tactics in Next Crisis,” *Bloomberg*, July 6, 2016, <https://www.bloomberquint.com/global-economics/2016/07/06/fed-s-williams-prefers-mbs-buying-to-ecb-tactics-in-next-crisis>.

<sup>17</sup> Blinder and Zandi.

<sup>18</sup> Josh Bivens, “Gauging the Impact of the Fed on Inequality During the Great Recession,” Brookings Institution, June 1, 2015, [https://www.brookings.edu/wp-content/uploads/2016/06/Josh\\_Bivens\\_Inequality\\_FINAL.pdf](https://www.brookings.edu/wp-content/uploads/2016/06/Josh_Bivens_Inequality_FINAL.pdf).

<sup>19</sup> Blinder and Zandi.

<sup>20</sup> Robin Greenwood, Samuel G. Hanson, and Jeremy C. Stein, “The Federal Reserve’s Balance Sheet as a Financial-Stability Tool,” 2016 Economic Policy Symposium, Federal Reserve Bank of Kansas City, September 2016, [https://scholar.harvard.edu/files/stein/files/jackson\\_hole\\_ghs\\_20160907\\_final.pdf](https://scholar.harvard.edu/files/stein/files/jackson_hole_ghs_20160907_final.pdf).

<sup>21</sup> Ben S. Bernanke, “Semiannual Monetary Policy Report to the Congress,” Committee on Banking, Housing, and Urban Affairs, February 26, 2013, <https://www.federalreserve.gov/newsevents/testimony/bernanke20130226a.htm>.

<sup>22</sup> Blinder and Zandi.

<sup>23</sup> “Testimony of Jared Bernstein, Senior Fellow, Before the House Budget Committee,” Center on Budget and Policy Priorities, June 17, 2015, <https://www.cbpp.org/federal-budget/testimony-of-jared-bernstein-senior-fellow-before-the-house-budget-committee>.

<sup>24</sup> Josh Bivens, “Why is recovery taking so long—and who’s to blame?,” Economic Policy Institute, August 11, 2016, <http://www.epi.org/publication/why-is-recovery-taking-so-long-and-who-is-to-blame/>.

<sup>25</sup> Bernanke, “Semiannual Monetary Policy Report to the Congress.”

<sup>26</sup> LaDonna Pavetti, “Subsidized Jobs: Providing Paid Employment Opportunities When the Labor Market Fails,” Center on Budget and Policy Priorities, April 2, 2014, <https://www.cbpp.org/sites/default/files/atoms/files/4-2-14fe-pavetti.pdf>.

<sup>27</sup> Indivar Dutta-Gupta, Kali Grant, Matthew Eckel, and Peter Edelman, “Lessons Learned from 40 Years of Subsidized Employment Programs,” Georgetown Center on Poverty and Inequality, Spring 2016, <https://www.law.georgetown.edu/academics/centers-institutes/poverty-inequality/current-projects/upload/GCPI-Subsidized-Employment-Paper-20160413.pdf>.

<sup>28</sup> Jared Bernstein and Ben Spielberg, “Preparing for the Next Recession: Lessons from the American Recovery and Reinvestment Act,” Center on Budget and Policy Priorities, March 21, 2016, <https://www.cbpp.org/research/economy/preparing-for-the-next-recession-lessons-from-the-american-recovery-and>.

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<sup>29</sup> Josh Bivens, "Is 2 percent too low?," Economic Policy Institute, June 9, 2017, <http://www.epi.org/files/pdf/129551.pdf>.

<sup>30</sup> John C. Williams, "Preparing for the Next Storm: Reassessing Frameworks and Strategies in a Low R-star World," Federal Reserve Bank of San Francisco, May 8, 2017, <http://www.frbsf.org/economic-research/publications/economic-letter/2017/may/preparing-for-next-storm-price-level-targeting-in-low-r-star-world-speech/>.

## MONETARY-FISCAL POLICY INTERACTIONS

Eric M. Leeper\*

Testimony before the Subcommittee on Monetary Policy and Trade  
 Committee on Financial Services  
 U.S. House of Representatives  
 July 20, 2017

Chairman Barr, Ranking Member Moore, subcommittee members, thank you for inviting me to talk with you.

The title of this hearing, “Monetary vs. Fiscal Policy,” frames the issue in an unfortunate way. That title harks back to the unproductive Keynesian-monetarist debates of the 1960s and 1970s. As I hope my comments make clear, a more constructive way to think about this is as “monetary *and* fiscal policy.” This is not merely a semantic point—it is fundamental economics. I commend the subcommittee for delving into this underappreciated topic.

## 1 POLICY INTERACTION BASICS

Research over the past 25 years emphasizes that monetary and fiscal policy *jointly* determine the economy-wide level of prices and the rate of inflation.<sup>1</sup> Out of that literature has emerged the understanding that two distinct combinations of monetary and fiscal policy behavior—policy regimes—can determine the price level and stabilize the level of government debt.

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\*Rudy Professor of Economics, Indiana University, Bloomington, IN 47405, eleper@indiana.edu. I thank Todd B. Walker for extensive conversations and comments.

<sup>1</sup>Early contributors include Leeper (1991), Sims (1994), Woodford (1995), and Cochrane (1999). Leeper and Walker (2013) and Leeper and Leith (2017) are recent overviews.

## 1.1 POLICY REGIMES

Table 1 summarizes the policy mixes that determine inflation and stabilize debt.

The first regime reflects the conventional view that monetary policy actively adjusts the policy interest rate to lean against inflation, while fiscal policy passively adjusts primary budget surpluses—revenues less expenditures, not including interest payments on government debt—to stabilize the long-run debt-GDP ratio. Taylor’s famous rule falls into this regime: the central bank raises the policy interest rate more than one-for-one with the inflation rate and raises the interest rate more modestly when the output gap increases [Taylor (1993)]. Because monetary policy focuses on stabilizing inflation and the real economy, fiscal policy must ensure that government debt remains well behaved. When fiscal policy makes taxes rise with the level of real government debt by more than enough to cover interest payments and some of the principal, the debt-GDP ratio will be stable in the long run. Many economists believe this regime prevails during “normal” economic times.

Policy Authority	Monetary-Fiscal Policy Regimes that Determine Inflation and Stabilize Debt	
	<i>Conventional View</i>	<i>Alternative View</i>
Monetary	Aggressively raises interest rate with inflation	Weakly raises interest rate with inflation
Fiscal	Raises primary surplus with real debt	Pursues other objectives besides debt stabilization

Table 1: Monetary-Fiscal Policy Mixes

A second, alternative, regime can also determine inflation and stabilize debt. In this regime, fiscal policy pursues other objectives by setting primary surpluses independently of debt and the price level. Monetary policy chooses the interest rate so that it responds only weakly—or not at all—to inflation, which permits expansions in government debt to raise the price level. Higher price levels reduce the *real* value of debt to make the debt-GDP ratio stable. Since the United States left the gold standard in April 1933, there have been several

instances in which the Federal Reserve seems to have followed this alternative behavior: from April 1933 until about 1936; throughout World War II until the Treasury-Fed Accord in March 1951; much of the 1970s; the 2008 financial crisis and its aftermath.<sup>2</sup> And there have been times when fiscal policy pays scant attention to debt in order to pursue other objectives: despite extremely high war debt, in 1948 Congress overrode President Truman's veto and cut taxes; the Economic Recovery Plan of 1981 increased primary deficits even as the debt-GDP ratio was rising from its post-war low in the early 1980s; both the Economic Growth and Tax Relief Reconciliation Act of 2001 and the Jobs and Growth Tax Relief Reconciliation Act of 2003 cut taxes at times of rising debt; the American Recovery and Reinvestment Act of 2009 increased spending and cut some taxes despite rising debt.<sup>3</sup>

## 1.2 FISCAL CONSEQUENCES OF MONETARY POLICY

To keep this discussion focused, in what follows I consider only the conventional mix of monetary and fiscal policy behavior. That policy combination embeds the Taylor rule as one example of monetary policy behavior.

Basic economic reasoning tells us that monetary policy actions have fiscal consequences. Let's start with something routine: the Federal Reserve raises the federal funds rate in order to reduce inflation. This isn't the end of the story: a higher funds rate tends to raise all interest rates, including those on government debt, so interest payments on outstanding debt increase.

Now fiscal policy comes into play. Those higher interest payments require higher taxes or lower expenditures in the future to service the debt. The message is: to successfully reduce inflation, *tighter monetary policy* necessarily requires *tighter fiscal policy* at some point. That fiscal response is essential for the Fed to be able to control inflation.

What happens if the fiscal response is not forthcoming because the fiscal authority never

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<sup>2</sup>See Taylor (1999), Clarida, Gali, and Gertler (2000), Lubik and Schorfheide (2004), and Davig and Leeper (2006).

<sup>3</sup>See Davig and Leeper (2006), Bhattarai, Lee, and Park (2016), and Bianchi and Ilut (2017).

adjusts taxes or spending? The dollar value of government debt grows to finance interest payments. Bond holders see their interest receipts rise, but don't anticipate higher offsetting taxes. They feel wealthier and demand more goods and services. Higher demand *raises* prices, *counteracting* the Fed's original intention to lower inflation.

Appropriate fiscal backing for monetary policy is critical for the Fed to achieve price stability.

## 2 U.S. AND INTERNATIONAL EXAMPLES

It is helpful to consider actual instances when policy behavior departed from the conventional monetary-fiscal regime.

### 2.1 AN IMPORTANT U.S. HISTORICAL CASE

Recovery from the Great Depression illustrates that the alternative monetary-fiscal policy mix has been an explicit policy choice.<sup>4</sup> President Franklin D. Roosevelt took office in March 1933 at the lowest point of the Great Depression. Compared to the third quarter of 1929, real GNP was 36 percent lower, industrial production had been cut in half, unemployment rose from almost nothing to a quarter of the workforce, and the price level had fallen 27 percent. The new president committed to raise the price level by achieving "...the kind of a dollar which a generation hence will have the same purchasing power and debt-paying power as the dollar we hope to attain in the near future" [Roosevelt (1933b)]. The first step toward permanently raising the price level was to abandon the gold standard in favor of what Roosevelt called a "managed currency" [Roosevelt (1933a)].

Abandoning convertibility of the dollar to gold, which included abrogating the gold clause on all future and past public and private contracts, changed the nature of government debt. Under convertibility, even though government bonds paid in dollars, the Treasury was required to convert those dollars into gold on demand. When the Treasury didn't have the gold

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<sup>4</sup>This draws on Jacobson, Leeper, and Preston (2017).

on hand, it had to acquire the gold, possibly through higher taxes. The new fiat currency standard broke the automatic link between new bonds and future surpluses: government bonds were simply promises to pay dollars, which the U.S. government could freely create without adjusting taxes.<sup>5</sup>

Roosevelt used three strategies to convince the public that higher debt would not necessitate higher future taxes. First, he made policy state-dependent, saying he would run bond-financed deficits until the economy recovered. Second, he emphasized the temporary nature of the policy by distinguishing between the “regular budget,” which he balanced, and the “emergency budget,” whose deficits were driven by relief spending. Finally, Roosevelt raised the political stakes by pitching economic recovery as a “war for the survival of democracy” [Roosevelt (1936)]. The strategies appeared to work because expected inflation began to rise by spring 1933 [Jalil and Rua (2016)].

Monetary policy behaved passively through the recovery. After the United States left gold, the Fed no longer needed to keep interest rates high to staunch the outflow of gold and the New York Fed reduced its discount rate to 1.5 percent in February 1934, where it remained until August 1937, when it was lowered to 1 percent. From November 1933 to February 1937, the Fed conducted no open-market purchases of Treasury securities. One contemporary observer wrote that the Federal Reserve “served merely as a technical instrument for effecting the Treasury’s policies” [Johnson (1939, p. 211)]. Clearly, the Fed did not follow anything resembling a Taylor rule, which permitted the expansion in government debt to stimulate the economy, as it does in the alternative policy mix.

Economic recovery was rapid. Real GNP returned to its pre-depression level in 1937. Price levels—consumer and wholesale price indexes and the GNP deflator—rose but fell short of regaining their levels in the 1920s. Historians like Friedman and Schwartz (1963) and Romer (1992) attribute recovery to money supply growth brought about by gold inflows from a politically unstable Europe, inflows which the Treasury chose not to sterilize. But

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<sup>5</sup>Today all but the 10 percent of Treasury debt that is indexed to inflation is also merely a promise to pay future dollars.

that explanation overlooks the significant expansion in government debt that took place. The dollar value of federal debt outstanding doubled in the 6 years after leaving the gold standard, reflecting the substantial fiscal stimulus associated with Roosevelt's relief programs.

Remarkably, this expansion in nominal debt did not raise the debt-GNP ratio. Figure 1 plots the par and market values of gross federal debt as percentages of GNP from 1920 to 1940. The vertical line marks departure from gold in April 1933. After bottoming out in September 1929 at 15.6 percent, the debt-GNP ratio rose steadily while the United States was still on gold, reaching 44.7 percent in March 1933. It then remained below 45 percent through the end of 1937. Economic recovery raised both the price level and the real level of economic activity, ensuring that the debt-GNP ratio was stable.



Figure 1: Par and market value of gross federal debt as a percentage of GNP. Source: Hall and Sargent (2015), Balke and Gordon (1986), and authors' calculations. Vertical line marks departure from the gold standard.

In this alternative policy mix, the Federal Reserve behaved passively, permitting the fiscal expansion to raise aggregate demand and with it, prices and output. With this policy mix, there need not be any conflict between fiscal expansion and fiscal sustainability, as the data in figure 1 neatly illustrate.



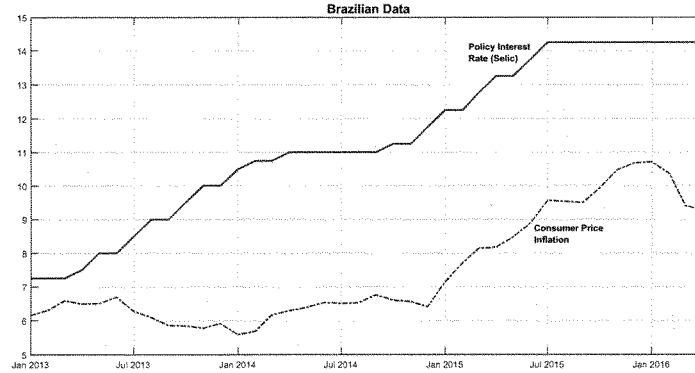


Figure 2: Brazilian monetary policy interest rate and consumer price inflation rate. Source: IHS Global Insight.

## 2.2 RECENT INTERNATIONAL CASES

Countries have not always provided appropriate fiscal backing.<sup>6</sup> In recent years, Brazil followed a fiscal policy that was unresponsive to debt, while its central bank sought to target inflation. The 1988 constitution indexed government benefits to inflation, which placed 90 percent of expenditures out of legislative control. At the same time, tax increases were politically infeasible, leading to growing primary deficits with no prospect of reversal. When inflation began to rise, the central bank aggressively raised interest rates, just as the Taylor principle instructs. Debt service rose, driving up aggregate demand and inflation. In December 2015, the primary deficit was 1.88 percent of GDP, but the gross deficit—primary plus interest payments—was 10.34 percent of output. Figure 2 plots Banco Central do Brasil’s policy rate, the Selic, along with the consumer price inflation rate from 2013 through 2015. Despite a doubling of the policy rate, the inflation rate rose by nearly 5 percentage points: monetary policy does not appear to be controlling inflation.

It is tempting to infer that Brazil’s problems stemmed from dysfunctional fiscal policy. Surely, if fiscal policy follows well-specified guidelines that ensure “responsible” fiscal

<sup>6</sup>Leeper (2017) discusses these and other examples in detail.

behavior, monetary policy will be able to control inflation.

Two European countries have had fiscal rules for some years and take those rules seriously. By “seriously” I mean the governments actually follow the rules.<sup>7</sup> Sweden’s *Fiscal Policy Framework* lays out the general principles that guide fiscal policy [Swedish Government (2011)]. Each elected government then adopts the particular rules it will follow to be consistent with the framework. Currently, Sweden aims for a 1/3 percent of GDP target for net lending (the surplus inclusive of interest payments) and is now considering also imposing a 35 percent of GDP “debt anchor.” This anchor is akin to a target around which debt will fluctuate within prespecified bounds.

Since a nationwide referendum in 2001, Switzerland has followed a debt brake, which limits spending to average revenue growth over several years. If spending differs from this limit, the difference is debited or credited to an adjustment account that has to be corrected in coming years. Debt brakes have a built-in error-correction mechanism intended to restrict the size of government debt.<sup>8</sup>

The top panel of figure 3 suggests that Swedish and Swiss fiscal rules have worked to limit debt growth. In both countries, debt has steadily fallen over the past 15 years and now is about 35 percent of GDP. Remarkably—and these two countries may be the sole exceptions—debt either continued to fall or was flat during the financial crisis. This stunning outcome is a testament to the effectiveness of fiscal rules that are followed.

But this prudent fiscal policy may have come at a cost in terms of inflation targeting. Both countries have 2 percent inflation targets that have been missed. In Switzerland, inflation has been persistently below target since the beginning of 2009. Swedish inflation has been below 2 percent for the past five and a half year. Low inflation rates are not the result of inadequate efforts by monetary policy: policy interest rates have been negative since the beginning of 2015.

The Swedish and Swiss cases illustrate that fiscal backing for monetary policy must be

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<sup>7</sup>This draws on Leeper (2016).

<sup>8</sup>See Danninger (2002) and Bodmer (2006) for additional details and analyses.

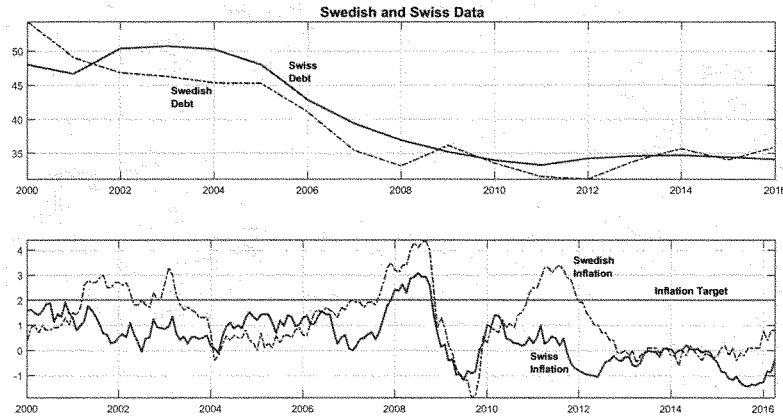


Figure 3: Debt-GDP ratio and CPI inflation rates in Sweden and Switzerland. Sources: Statistics Sweden, Swedish National Debt Office, and Swiss National Bank.

symmetric. When monetary policy reduces interest rates and interest payments on government debt, fiscal policy needs to reduce taxes. Fiscal rules designed primarily to reduce government debt may interfere with the symmetry of fiscal backing.

These international examples offer suggestive evidence of how monetary and fiscal policies that are inconsistent with each other can produce undesirable economic outcomes. Each is a case in which monetary and fiscal authorities independently pursue their objectives and fiscal authorities fail to provide the fiscal backing needed for the central banks to control inflation.

### 3 CURRENT U.S. SITUATION

Economic developments in the United States today underscore the need to understand the joint impacts of monetary and fiscal policies.

## 3.1 RECENT DATA

For almost a decade, U.S. monetary policy has been highly stimulative and federal government debt has grown rapidly, yet inflation has remained benign. A few facts from table 2 and figure 5:

- Short-term interest rates have been below 1 percent for the past nine years.
- Over that period, bank reserves increased by a factor of 52.
- Inflation, by any measure, has averaged less than 2 percent since 2008.
- Longer-term Treasury yields have been trending down, suggesting that markets do not expect inflation to pick up.

	Average Annual Rate 2008Q1-2017Q1	Ratio of Value in 2017Q1 to Value in 2008Q1
Federal funds rate	0.37	—
3-month Treasury rate	0.26	—
Core CPI	1.82	—
Core PCE	1.57	—
GDP Deflator	1.53	—
Bank reserves	—	51.7
Gross debt	—	2.0

Table 2: Core CPI is less food and energy; Core PCE is personal consumption expenditures excluding food and energy; GDP deflator is implicit price deflator; Bank reserves are total reserves of depository institutions; Gross debt is the market value of gross federal debt. Sources: Bureau of Labor Statistics, Bureau of Economic Analysis, Federal Reserve Board, Federal Reserve Bank of Dallas.

How can this happen?

Massive growth in bank reserves hasn't created inflation because banks happily hold idle and safe reserves whose yield exceeds those in the federal funds and short-term Treasury

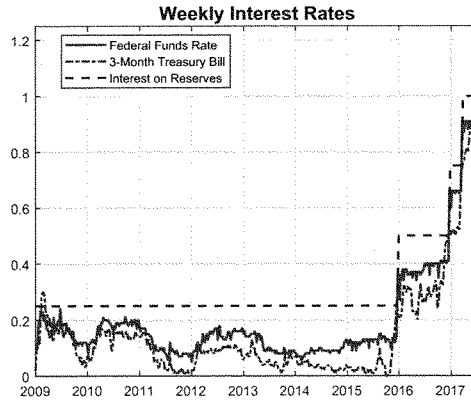


Figure 4: Source: Federal Reserve Board.

markets [figure 4]. By holding onto excess reserves, banks have not expanded deposits and, therefore, broad monetary measures at unusually high rates.

There is another fact with which this committee is familiar:

- Gross federal debt has doubled since 2008 [figure 5].

Why hasn't this been inflationary?

In a phrase: bond-market pessimism.

During the financial crisis, there was a worldwide flight to safety: investors had an insatiable appetite for Treasuries. This demand, perhaps more than monetary policy actions, has kept bond yields low. That appetite continues today, ensuring demand more than absorbs the expanding supply of bonds. As long as people expect future surpluses will adjust to finance the growing debt, the expansion in debt will not significantly raise aggregate demand and the price level.

The question for monetary policy is: what happens to inflation—and the Fed's ability to control it—when the thirst for safety is quenched? The answer hinges very much on the *fiscal* response.

## LEEPER WRITTEN TESTIMONY: POLICY INTERACTIONS

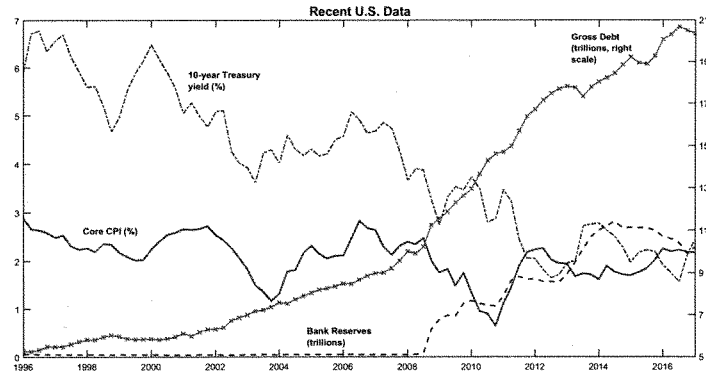


Figure 5: Core consumer price inflation is CPI all items less food and energy and 10-Year Treasury constant maturity rate are both in percentages on the left scale; total reserves of depository institutions are in trillions of dollars on the left scale. Gross federal debt is the market value in trillions of dollars on the right scale. Source: Federal Reserve Board, Bureau of Labor Statistics, Federal Reserve Bank of Dallas.

### 3.2 AN ACCOUNTING EXERCISE

What I've described arises naturally from a fiscal policy that aims to stabilize the government debt-GDP ratio. What's important is that the private sector understands and believes that the fiscal response will eventually take place. Of course, when debt levels are low, the changes in debt service and, therefore, taxes, are modest. Debt service has also been modest during the past decade because interest rates have been exceptionally low.

The fortuitous fiscal effects of low interest rates may be coming to an end.

This committee has heard previous testimony about the process of monetary policy “normalization.” But there is an important fiscal component to normalization that I want to highlight. Here is a little accounting exercise. The market value of gross federal debt is now a bit higher than nominal GDP. If interest rates on government bonds rise from current levels to 6 percent, roughly the post-World War II average, interest payments will rise over time by about 5 percent of GDP or close to \$1 trillion.

Debt service now consumes about 10 percent of federal expenditures. In the late 1980s

and early 1990s, at its post-war peak, debt service was 20 percent of expenditures—and then the debt-GDP ratio was under 60 percent. Evidently, interest-rate normalization carries substantial fiscal implications.

#### 4 POLICY RULES

Formal economic models posit algebraic rules that govern policy behavior. These rules are necessarily extreme simplifications of actual policy behavior, designed to highlight how specific components of systematic policy behavior affect the economy's operation. They are not intended to be a complete description of how policy behaves in every possible situation.

Policy rules may be *descriptive* or *prescriptive*. Moving from describing behavior to prescribing behavior is, to me, a very large leap. At this point, the most we can ever say is that a particular simple rule seems to deliver good economic welfare across some set of formal models. But those models embed a great many stated and unstated assumptions that may or may not apply to the actual economy. Assumptions include formulations of private economic behavior, particularly private-sector expectations, and a range of shocks that may hit the economy.

The studies do have a common thread: *All analyses that conclude beneficial outcomes from Taylor-type rules for monetary policy maintain the assumption that fiscal policy also obeys a rule that appropriately backs the monetary policy behavior.*

Of course, I do not advocate completely discretionary policy untethered by guiding principles. Both monetary and fiscal policy must be guided by broad economic objectives. And both monetary and fiscal policy authorities must be held accountable for achieving those objectives.

Underlying the discussion in this testimony is the need for systematic fiscal backing for monetary policy. Whether the Federal Reserve follows a Taylor rule, some other rule, or no algebraic formulation, so long as its mandate include price stability, its success hinges on stable and reliable fiscal backing.

## REFERENCES

- BALKE, N., AND R. J. GORDON (1986): "Appendix B: Historical Data," in *The American Business Cycle: Continuity and Change*, ed. by R. J. Gordon, pp. 781–850. University of Chicago Press, Chicago.
- BHATTARAI, S., J. W. LEE, AND W. Y. PARK (2016): "Policy Regimes, Policy Shifts, and U.S. Business Cycles," *Review of Economics and Statistics*, 98(5), 968–983.
- BIANCHI, F., AND C. ILUT (2017): "Monetary/Fiscal Policy Mix and Agents' Beliefs," *Review of Economic Dynamics*, 26(October), 113–139.
- BODMER, F. (2006): "The Swiss Debt Brake: How it Works and What Can Go Wrong," *Schweizerische Zeitschrift für Volkswirtschaft und Statistik*, 142(3), 307–330.
- CLARIDA, R., J. GALÍ, AND M. GERTLER (2000): "Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory," *Quarterly Journal of Economics*, 115(1), 147–180.
- COCHRANE, J. H. (1999): "A Frictionless View of U.S. Inflation," in *NBER Macroeconomics Annual 1998*, ed. by B. S. Bernanke, and J. J. Rotemberg, vol. 13, pp. 323–384. MIT Press, Cambridge, MA.
- DANNINGER, S. (2002): "A New Rule: 'The Swiss Debt Brake'," IMF Working Paper WP/02/18, January.
- DAVIG, T., AND E. M. LEEPER (2006): "Fluctuating Macro Policies and the Fiscal Theory," in *NBER Macroeconomics Annual 2006*, ed. by D. Acemoglu, K. Rogoff, and M. Woodford, vol. 21, pp. 247–298. MIT Press, Cambridge.
- FRIEDMAN, M., AND A. J. SCHWARTZ (1963): *A Monetary History of the United States, 1867–1960*. Princeton University Press, Princeton, NJ.
- HALL, G. J., AND T. J. SARGENT (2015): "A History of U.S. Debt Limits," Manuscript, New York University, December 8.
- JACOBSON, M. M., E. M. LEEPER, AND B. PRESTON (2017): "Recovery of 1933," Manuscript, Indiana University, February.
- JALIL, A. J., AND G. RUA (2016): "Inflation Expectations and Recovery in Spring 1933," *Explorations in Economic History*, 62(October), 26–50.
- JOHNSON, JR., G. G. (1939): *The Treasury and Monetary Policy, 1933–1938*. Russell & Russell, New York.
- LEEPER, E. M. (1991): "Equilibria Under 'Active' and 'Passive' Monetary and Fiscal Policies," *Journal of Monetary Economics*, 27(1), 129–147.
- (2016): "Why Central Banks Should Care About Fiscal Rules," *Sveriges Riksbank Economic Review*, 3, 109–125.



- (2017): “Fiscal Analysis is Darned Hard,” in *Rethinking Fiscal Policy After the Crisis*, ed. by  udov t  dor, pp. 23–70. Cambridge University Press, Cambridge, U.K.
- LEEPER, E. M., AND C. LEITH (2017): “Understanding Inflation as a Joint Monetary-Fiscal Phenomenon,” in *Handbook of Macroeconomics*, ed. by J. B. Taylor, and H. Uhlig, vol. 2B, pp. 2305–2416. Elsevier Press, Amsterdam.
- LEEPER, E. M., AND T. B. WALKER (2013): “Perceptions and Misperceptions of Fiscal Inflation,” in *Fiscal Policy After the Financial Crisis*, ed. by A. Alesina, and F. Giavazzi, pp. 255–299. University of Chicago Press, Chicago.
- LUBIK, T. A., AND F. SCHORFHEIDE (2004): “Testing for Indeterminacy: An Application to U.S. Monetary Policy,” *American Economic Review*, 94(1), 190–217.
- ROMER, C. D. (1992): “What Ended the Great Depression?,” *Journal of Economic History*, 52(4), 757–784.
- ROOSEVELT, F. D. (1933a): “Fireside Chat,” October 22, 1933. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=14537>.
- (1933b): “Wireless to the London Conference,” July 3, 1933. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=14679>.
- (1936): “Acceptance Speech for the Renomination for the Presidency,” Philadelphia, PA, June 27. Online by Gerhard Peters and John T. Woolley, The American Presidency Project. <http://www.presidency.ucsb.edu/ws/?pid=15314>.
- SIMS, C. A. (1994): “A Simple Model for Study of the Determination of the Price Level and the Interaction of Monetary and Fiscal Policy,” *Economic Theory*, 4(3), 381–399.
- SWEDISH GOVERNMENT (2011): *The Swedish Fiscal Policy Framework*. Regeringskansliet, Stockholm.
- TAYLOR, J. B. (1993): “Discretion versus Policy Rules in Practice,” *Carnegie-Rochester Conference Series on Public Policy*, 39, 195–214.
- (1999): “An Historical Analysis of Monetary Policy Rules,” in *Monetary Policy Rules*, ed. by J. B. Taylor, pp. 319–341. University of Chicago Press, Chicago.
- WOODFORD, M. (1995): “Price-Level Determinacy Without Control of a Monetary Aggregate,” *Carnegie-Rochester Conference Series on Public Policy*, 43, 1–46.

### Sorting Out Monetary and Fiscal Policies

Mickey D. Levy\*

Testimony before the Subcommittee on Monetary Policy and Trade  
Committee on Financial Services  
U.S. House of Representatives

July 20, 2017

Chairman Barr, Ranking Member Moore and Members of the Committee, I appreciate this opportunity to present my views on monetary and fiscal policies. Both have gone off-course. Excessively easy monetary policy, marked by a massive increase in the Federal Reserve's balance sheet and sustained negative real interest rates, has failed to stimulate faster economic growth, but has distorted financial behavior and involves sizeable risks. Fiscal policies have resulted in an unhealthy rise in government debt, and projections of dramatic further increases involve incalculable risks. Monetary and fiscal policies interact in undesirable ways. The Fed's expanded scope of monetary policy has blurred the boundaries with fiscal and credit policies, and the ever-growing government debt may eventually impinge on the Fed and its independence.

A reset of monetary and fiscal policies is required. The Fed has begun to normalize monetary policy, so at this point, a shift in fiscal policy is much more pressing.

The Fed must continue to raise interest rates and begin unwinding its balance sheet, but be more aggressive than indicated in its current strategy, including eventually fully unwinding its holdings of mortgage-backed securities (MBS). A full normalization of monetary policy would benefit economic performance and improve financial health. Equally important, the Fed must acknowledge the limitations of monetary policy and step back from policy over-reach, including credit allocation and its excessive focus on short-term fine-tuning.

The longer-run projections of government debt are alarming, and must be taken seriously (see Chart 1). Congress must develop and implement a strategy that guarantees sound longer-run finances. This requires tough choices but the costs of inaction are rising. ***Many acknowledge the risks of rising debt for future economic performance, but in reality the burdens of the government's finances***

\*Chief Economist of Berenberg Capital Markets, LLC for the Americas and Asia, and member, Shadow Open Market Committee. The Views expressed in this paper are the author's own and do not reflect those of Berenberg Capital Markets, LLC.

*are already affecting current economic performance and the government's allocation of national resources.* Witness how the persistent increases in entitlement programs and concerns about high government debt squeeze spending on infrastructure, research and development and other activities that would enhance economic performance. Under current laws, these budget constraints—at the Federal as well as those facing State and municipal governments—will only increase in severity.

Congress's fiscal agenda must be two-pronged. First, you must develop and enhance programs and initiatives that directly address the sources of undesired economic and labor market underperformance while restructuring and trimming spending programs that are ineffective and wasteful. Second, you must enact laws that phase in reforms of the entitlement programs over lengthy periods to constrain the projected growth of *future* spending in a fair and honest way, protecting lower income retirees while providing sufficient time for older workers to plan for retirement.

I fully understand the frustrations stemming from the under-performance of the economy in recent years—the sizeable pockets of persistently high unemployment and low wages facing many working-age people, and weak trends in business investment and productivity that underlie disappointingly slow growth. *We all want better performance. But the issue is how to achieve it.*

*Neither the Fed's sustained monetary ease nor high deficit spending address structural challenges facing labor markets, business caution in expansion and investing, weak productivity and other critical issues.* This is particularly apparent with the unemployment rate at 4.4%, below standard estimates of full employment.

*The reality is monetary policy cannot create permanent jobs, improve educational attainment or skills, permanently reduce unemployment of the semi-skilled, or raise productivity or boost real wages.* Rather, monetary policy is an aggregate demand tool. The major sources of underperformance involve structural challenges that are beyond the Fed's ability to address. Yet in recent years, there has been excessive reliance on the Fed. All too frequently, analysts and observers opine “fiscal policy is dysfunctional so the Fed has to ease policy”. This assumes that monetary policy and fiscal policy are two interchangeable levers. They are not. *Monetary policy is not a substitute for fiscal policy.* Monetary

policy controls interest rates and the amount of money in the economy, which influences aggregate demand and longer-run inflation.

Fiscal policy operates differently. Government spending programs and tax structures allocate national resources—for income support, national defense, health care, public goods like infrastructure and an array of other activities—and create incentives favoring certain activities while discouraging others. In a critical sense, the magnitude and mix of spending programs and the structure and details of tax policies—along with the magnitudes of deficit spending—reveal the nation’s priorities set by fiscal policymakers. These allocations of national resources and how specific spending and tax provisions influence households and businesses are key inputs to economic performance, productivity and potential growth.

In recent decades the most pronounced change in the government budget is the rapid expansions of Social Security, Medicare and Medicaid. The objectives of these entitlements are laudable, and they are critical for government and society. However, the resulting dramatic rise in the share of government spending allocated to income support and health, along with the rising concerns about the rising debt, has squeezed spending on other programs, including those that enhance longer-run productive capacity. Can these government programs be improved, made more efficient or modified in ways that maintain their objectives? Yes. Congress must cut through budget categorizations like “mandatory spending” and “discretionary spending programs” and identify ways to improve the efficiency of these programs while maintaining their intent.

Aside from monetary and fiscal policies, labor market performance and business decisions are affected by a growing web of economic and labor regulations imposed by the Federal, state and local governments. Private industries add to the list of regulatory requirements, including the expanding imposition of occupational certification requirements and other practices like “non-compete” job contracts. Certainly, while some of these government regulations and industry rules serve important roles, many constrain the mobility of a sizeable portion of the labor force, limit job opportunities and are very costly to the economy. Obviously, these are beyond the scope of monetary and fiscal policy.

***I mention regulatory policies in the same breath as monetary and fiscal policies because each has unique economic effects. In order to improve performance and standards of living, we need to address***

***the sources of the underperformance with the proper policy tools, rather than rely on standard monetary and fiscal stimulus that are unlikely to have desired outcomes.***

**The Fed's expanded scope.** The Fed deserves credit for its quantitative easing (QE) in 2008-2009 that helped restore financial stability and end the deep recession. The paralysis in the mortgage and short-term funding markets was scary and truly a crisis. The Fed's aggressive interventions and asset purchases, including MBS and its "bailout" of AIG, directly involved the Fed in credit allocation and fiscal policy. At the time, Fed Chairman Bernanke explicitly identified them as temporary emergency measures, and stated that the Fed would exit them on a timely basis.

But the efficacy of the Fed's dramatic expansion of its large scale asset purchase programs (LSAPs) and targeting the Fed funds rate below inflation well after the economy had achieved sustainable growth and financial markets had stabilized is questionable, and the expanded scope of monetary policy involves large risks (see Chart 2). Financial markets have been stimulated, but the economy has been largely unresponsive: nominal GDP has not accelerated, and economic growth has been sub-normal (see Chart 3). Business investment has been disappointing despite the Fed's successful efforts to lower the real costs of capital. Productivity gains have been weak and estimates of potential growth have been reduced significantly. Labor markets have clearly improved, but large pockets of under employment persist.

Non-monetary factors including government tax and regulatory policies have hampered credit growth and economic performance. In banking, the burdensome micro regulations imposed by Dodd-Frank and the Fed's stress tests have deterred bank lending. The Fed's low rates and forward guidance aimed at keeping bond yields low have dampened expectations. As a result, monetary policy channels have been clogged so the high powered money created by the Fed's large scale asset purchases (LSAPs) remain as excess reserves on big bank balance sheets and have not been put to work in the economy. In the nonfinancial sector, the array of taxes and regulatory burdens and mandated expenses imposed by Federal, state and local governments have led businesses to raise their hurdle rates for investment projects. Many job-creating expansion plans have been scuttled.

***The Fed takes far too much credit for the sustained economic expansion and labor market improvement of recent years.*** In reality, without the sustained aggressive monetary ease, the economy

would have continued to expand and jobs would have increased. History shows clearly that economic performance has not been harmed when the Fed has normalized interest rates following a period of monetary ease. Not surprisingly, the three Fed rate hikes since December 2015 have had no material impact on economic performance.

***The failure of nominal GDP to accelerate in response to the Fed's unprecedented monetary ease has been the critical reason why wage increases have remained modest and inflation has remained below the Fed's 2% target.*** The slow (and nonaccelerating) growth of aggregate product demand has constrained business pricing power and at the same time has influenced wage setting behavior. In every prior expansion in which the unemployment rate fell below standard estimates of its natural rate ("full-employment"), wages accelerated briskly. During this expansion, the slower growth in aggregate product demand has been a key constraining factor. Inflation additionally has been constrained by lower prices of select goods and services stemming from technological innovations. Most notably, the PCE deflator for durable goods has fallen persistently since the mid-1990s. These innovations have increased consumer purchasing power and benefited the economy. It is ironic that the inability of aggressive monetary ease to stimulate aggregate demand has allowed the Fed to be complacent about normalizing policy without violating its dual mandate.

The Fed's historic tendency to fine-tune the economy and financial markets has been accentuated. The Fed's LSAPs, reinvestment policy and hesitancy to normalize policy have been heavily influenced by short-term fluctuations in the economy, global and domestic markets, the labor force participation rate and wages. These are beyond the Fed's mandate and well beyond the scope of monetary policy. Such short-term focus historically has led to policy mistakes.

**The Fed's balance sheet.** As a result, the Fed maintains a balance sheet of \$4.5 trillion, including \$2.5 trillion of US Treasury securities of various maturities and \$1.8 trillion of (MBS), primarily with long maturities (see Chart 4). The Fed is now the largest holder of each (17% of outstanding publicly-held Federal debt and 12% of MBS outstanding). Prior to the financial crisis, the Fed's balance sheet was roughly \$850 billion, comprised nearly entirely of short-term Treasury and other liquid securities.

The Fed finances these assets in large part by borrowing over \$2 trillion in short-duration notes from the banking system, and accounts for these liabilities as excess reserves on its balance sheet. An estimated

25%-33% of excess reserves are held in US branches of foreign banks. In October 2008 the Fed adopted a policy to pay interest on excess reserves (IOER) equal to the top band of the Fed funds target, with the intention of providing a floor for propping up the effective Fed funds rate. With the Fed's June rate increase, it now pays 1.25% on IOER.

The Fed's current balance sheet strategy is to gradually and passively unwind a fairly even portion of its Treasury and MBS holdings with an aim of maintaining a large buffer of excess reserves. This implies a shift from pre-financial crisis operating procedures. The Fed is very concerned about adverse implications for financial markets and mortgage rates in particular and has built an argument that maintaining a large amount of excess reserves going forward would be beneficial to financial markets and the Fed's conduct of monetary policy.

***But the Fed's holdings of MBS are inappropriate, directly involving monetary policy in credit allocation, and should be totally unwound.*** The Fed's MBS holdings effectively favor mortgage credit over other types of credit. While the initial MBS purchases during the height of the financial crisis had a distinct purpose, continuing to hold MBS makes little sense. ***This expanded scope of monetary policy is all the more irrational in light of the healthy growth in housing and high home prices.***

The Fed's intention to maintain a large buffer of excess reserves would require the Fed to continue to pay IOER and manage the effective Fed funds rate through a "floor system". I prefer a strategy of maintaining a smaller balance sheet that would involve less excess reserves in the banking system and rely on the market-based "corridor system" that was used through most of the Fed's history. Doing so would allow the Fed to lessen its exposure in the over-night reverse repo market. However, this operational preference is of less importance than the higher priorities of fully winding down the Fed's MBS holdings and reining in the scope of monetary policy.

**Monetary influences on fiscal policy.** The Fed's balance sheet, low policy rate, and forward guidance aimed at keeping bond yields low temporarily reduce budget deficits and the government's debt service costs. The Fed effectively is operating a massive positive carry strategy by borrowing short and lending long. This will generate profits and reduce budget deficits as long as interest rates stay low. The Fed's remittances to the US Treasury reached a peak of \$117 billion in Fiscal Year 2015 and have receded as

the Fed has hiked rates that has triggered an increase in IOER to banks. These large remittances to the Treasury have materially reduced recent budget deficits.

While this may sound good superficially, it involves sizeable risks—to current and future taxpayers—and entangles the Fed’s monetary policy in the government’s budget and fiscal policies in unhealthy ways. It also compromises the Fed’s independence, a concern that should be taken seriously.

***Congress seems to perceive that the Fed’s policies aimed at stimulating the economy and lowering deficits and debt service costs are risk-free and permanent, when in fact they involve sizeable interest rate exposure.*** The Fed’s remittances will fall as it normalizes its policy rate. More importantly, in light of the magnitude of Federal debt outstanding (currently \$15 trillion and estimated by the Congressional Budget Office to rise to \$27 trillion in 2027), budget deficits and debt service costs are very sensitive to interest rates. The CBO estimates that a 1 percentage point increase in interest rates from its baseline assumptions over the 10-year projection period would add \$1.6 trillion to the budget deficit.

Such interest rate risk must be taken seriously. The Fed’s forecasts of higher policy rates, sustained economic growth and a rise in inflation to 2% point toward higher bond yields, and prior experiences of positive carry strategies often end badly. Witness the failures of many private financial companies, as well as Fannie Mae and Freddie Mac, which required government bailouts. ***The Fed’s efforts to be more transparent should include a clear assessment of the government’s budgetary risks of its sustained monetary ease.***

The suppressed deficits and debt service costs have eased pressure on Congress to address the growing budget imbalance. The Fed’s profits remitted to the Treasury have also proved enticing to fiscal policymakers and encouraged undesirable budget practices. In December 2015, Congress’s enactment of the FAST Act to provide financing for transportation infrastructure relied on budgetary “sleight of hand” in which it redirected a small portion of the Fed’s assets and some of its net profit into the Highway Trust Fund. The Fed was compromised but did not protest the way this budgetary procedure inappropriately used monetary policy for fiscal purposes. This episode sounds minor, but it illustrates the potential vulnerabilities of the Fed’s expanded scope.



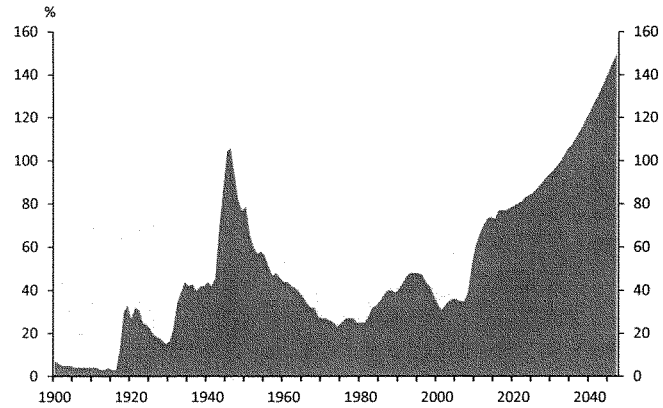
**Fiscal policy influences on monetary policy.** To date fiscal considerations have not influenced the Fed's monetary policy deliberations. The debates about tax reform, the Fiscal Year 2018 government budget and potential snags relating to the debt ceiling add uncertainties that the Fed must consider, but they have been relatively low-level concerns. The projections of dramatically rising government debt, and the lack of impetus of fiscal policymakers to address the issue, raise the prospects that the government's finances may influence the Fed and impinge on monetary policy.

The bottom line is sound monetary policy ultimately relies on sound government finances. In the extreme, unsustainably high government debt service burdens may dominate monetary policy and require the Fed to accommodate fiscal policy by reducing the real value of the debt or in an extreme by ensuring the government's solvency. Such a prospect of fiscal dominance of monetary policy seems remote and far off. However, it may not be so distant, particularly if fiscal policymakers ignore the longer-term budget debt realities. Moreover, nobody really knows when the level of debt becomes "unsustainable" or when or how government finances may unhinge inflationary expectations.

In this context, the current fiscal debate about tax policy should be focusing on reforms that increase productive capacity by reducing inefficiencies and distortions and improving the environment for economic expansion, rather than temporary fiscal stimulus that involves more deficit spending. This is particularly true with the economy entering its ninth consecutive year of expansion.

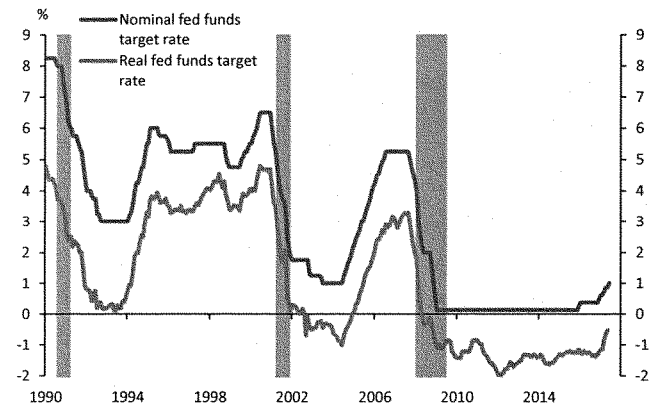
Congress faces several alternative fiscal policy paths. It may continue to avoid reforms of current spending programs and the tax structure. Economic growth would remain slow, large pockets of underperformance in labor markets and slow wage growth would persist, reliance on income support would mount and government programs would become increasingly strained, and government debt would continue to rise rapidly. Disappointing economic performance would be reinforced, and downside risks would rise. Alternatively, Congress may develop and implement reforms of current spending programs, particularly the entitlements, improving their structures while maintaining their intent, and address the sources of the rising government debt, and reform and simplify the tax system, particularly corporate taxes. These efforts would lift sustainable economic growth, improve the productivity, wages and economic well-being of underperformers in labor markets, and ease burdens on income support systems and improve government finances. Future concerns are quickly becoming current realities. The time for policy action is now.

**Chart 1: Federal debt held by the public as a percentage of GDP**



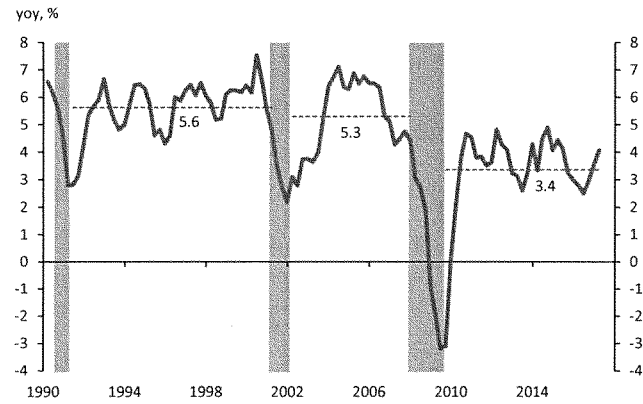
Source: Congressional Budget Office

**Chart 2: Nominal and real federal funds target rate\***



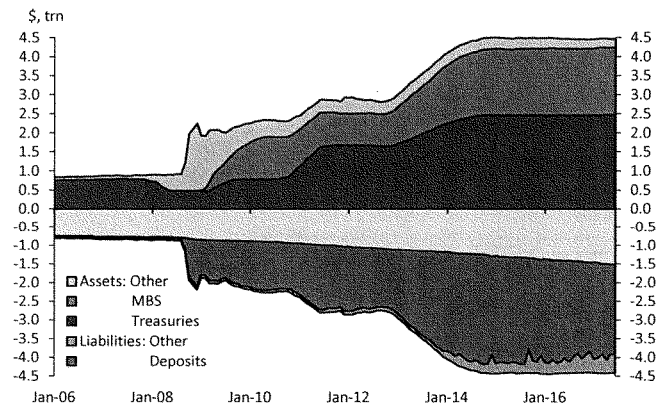
\*Note: Real federal funds target rate deflated by core PCE inflation. Source: Federal Reserve Board and Bureau of Economic Analysis

Chart 3: Nominal GDP growth



Source: Bureau of Economic Analysis

Chart 4: Federal Reserve's assets and liabilities



Source: Federal Reserve Board

## Testimony

Before the U.S. House of Representatives Committee on Financial Services  
 Monetary Policy and Trade Subcommittee  
 Hearing on “Monetary Policy v. Fiscal Policy: Risks to Price Stability and the Economy”

George Selgin  
 Director, Center for Monetary and Financial Alternatives, Cato Institute

July 20, 2017

**I. Introduction**

Chairman Barr, Ranking Member Moore, and distinguished members of the Committee on Financial Services Monetary Policy and Trade Subcommittee, my name is George Selgin, and I am the Director of the Cato Institute’s Center for Monetary and Financial Alternatives. I am also an adjunct professor of economics at George Mason University, and Professor Emeritus of Economics at the University of Georgia. I am grateful to all of you for having granted me this opportunity to testify before you on the subject of “Monetary Policy v. Fiscal Policy: Risks to Price Stability and the Economy.”

Rather than attempt to address each of the many facets of this broad subject, I will devote my remarks to one that seems to me especially important. I refer to the risks to price stability, to the efficient employment of the public’s scarce savings, and ultimately to economic growth, posed by the Fed’s decision, made during the 2008 financial crisis, to switch from its traditional operating system to a radically new one, involving the payment of interest on banks’ excess reserves at above-market rates.

Although it has attracted less attention, and generated less controversy, than some of the Fed’s other crisis-related innovations, the Fed’s decision to pay interest on excess reserves (henceforth IOER, to use the Fed’s own preferred acronym) has had more profound and enduring consequences than those of most of its other crisis-inspired undertakings. And despite Fed officials’ intentions, those consequences have been almost entirely harmful. While those officials claimed, and presumably believed, that IOER would assist them in maintaining the flow of private credit in the face of extremely low and falling interest rates, the new policy’s actual effects have been very much at odds with those intentions.

Among other things, the Fed’s resort to IOER, and its particular settings of the IOER rate,

- intensified an already severe economic downturn by serving as the means by which the Fed maintained an excessively tight monetary policy;
- led to a sustained collapse in the interbank market for federal funds, thereby destroying the Fed’s traditional means of monetary control;

- dramatically reduced the effectiveness of open-market operations, so that even massive Fed asset purchases might not supply the stimulus to investment and spending that much smaller purchases would once have achieved; and
- undermined productivity by substantially increasing the Fed's role in allocating scarce credit.

Today, the Fed's practice of encouraging banks to hold excess reserves, besides continuing to have many of the harmful consequences it has had in the past, also threatens to prevent Fed officials from honoring their promise to shrink the Fed's balance sheet and to otherwise "normalize" monetary policy.

The rest of my testimony will explain in detail how the Fed's IOER experiment—which should henceforth be understood to mean, not just paying interest on excess reserves, but doing so at above-market rates—came about, what its intended and actual consequences have been, and why Congress should bring it to an end as rapidly as can be done without causing further economic damage.

## II. Origins of IOER

Economists have long understood that, to the extent that they bear no interest, bank reserves, including both banks' holdings of vault cash and their Federal Reserve deposit balances, serve as a tax on bank deposits, and therefore on bank depositors. Although the Fed earns interest on the assets backing such reserves, until October 2008 it didn't share that interest with commercial banks. Instead, thanks to its monopoly privileges and close relation to the government, it remitted all its interest earnings, net of its operating expenses, to the U.S. Treasury.

Though it was only in the midst of the recent financial crisis that the Fed first began paying interest on bank reserves, the possibility of its doing so has long been a subject of discussion and debate. Indeed, the idea was initially broached during the discussions that led to the passage of the original Federal Reserve Act in 1913. That original suggestion was ultimately rejected, in large part because of opposition from Wall Street banks, which saw it as a threat to their lucrative correspondent business.<sup>1</sup>

So matters stood for more than half a century, thanks to the generally low inflation and interest-rate environment that prevailed during most of that time, and, after 1933, to the fact that Regulation Q and other provisions of the 1933 Banking Act relieved commercial banks themselves of pressure to pay competitive rates of interest on their own deposit balances.

Starting in the mid 1960s, however, a combination of rising inflation rates, declining Fed membership, the rise of Money Market Mutual Funds, and increasingly intense global banking competition, revived Fed officials' desire to be able to pay interest

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<sup>1</sup> On Wall Street banks' role in the drafting of the Federal Reserve Act, see Selgin (2016).

on bank reserves, as an alternative to dispensing with mandatory reserve requirements, which they regarded as an aid to monetary control (see Weiner 1985; Higgins 1977; and Eubanks 2002). Over the course of the next several decades Fed officials tried several times to gain Congress's permission to pay interest on reserves.<sup>2</sup> Until 2006 these attempts were successfully opposed by the U.S. Treasury, which feared having its seigniorage earnings substantially reduced. But in that year the Fed finally managed to have the authority it had long sought included among the provisions of the Financial Services Regulatory Relief Act.

The Fed's ultimate success was made possible in large part by reduced Treasury opposition, itself due to a considerable decline, during the 1990s, in the burden posed by mandatory reserve requirements, and the corresponding decline in the Treasury's seigniorage revenues. Although actual requirements were reduced somewhat, their reduced burden was mainly due to banks' successful employment of "sweep accounts" to avoid them. By substantially reducing the effective reserve tax base, these developments also reduced the cost to the Treasury of allowing the Fed to pay interest on reserves.

By the same token, however, the reduced burden of reserve requirements also limited the "regulatory relief" banks would gain from interest payments on reserves. Perhaps in recognition of this, Fed officials, in making their successful bid for the right to pay interest on bank reserves, offered new grounds for doing so that had nothing to do with reducing the reserve tax. In particular, then Fed Governor Donald Kohn (2005) argued that, besides making it unnecessary for banks to resort to sweep accounts and other "reserve avoidance measures," interest on reserves, and on excess reserves especially, would assist the Fed in conducting monetary policy "by establishing a sufficient and predictable demand for balances at the Reserve Banks so that the System knows the volume of reserves to supply (or remove) through open market operations to achieve the FOMC's target federal funds rate."

Importantly, in view of later developments, Kohn's statement implied that IOER was meant to support, rather than supplant, the Fed's traditional methods of monetary control, including its reliance upon open-market operations as its chief tool for reaching its monetary targets.

Finally, Kohn said that the IOER rate

would act as a *minimum* for overnight interest rates, because banks would not generally lend to other banks at a lower rate than they could earn by keeping their

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<sup>2</sup> As Goodfriend and Hargraves (1983, pp. 16–17) report, in 1978, the Fed went so far as to declare that, because statute law didn't expressly prohibit it from doing so, it planned to start paying interest on reserves without Congress's permission. That gambit quickly came to grief when Representative Henry Reuss and Senator William Proxmire, the chairmen of the House and Senate Banking Committees, respectively, called it "a blatant usurpation of Congressional powers [that] would raise profound questions about the continued independence of the Fed."

excess funds at a Reserve Bank. Although the Board sees no need to pay interest on excess reserves in the near future, and any movement in this direction would need further study, the ability to do so would be a potentially useful addition to the monetary toolkit of the Federal Reserve (*ibid.*; emphasis added).

These remarks suggest that the Fed was contemplating a “corridor system” of the sort that many central banks were then employing. In such a system, the IOER rate serves as a lower bound for the central bank’s policy rate, while the central bank’s emergency lending rate serves as an upper bound. Although the policy rate can vary within these limits, it generally stays close to a target set, in most instances, half-way between them. Most importantly, it is kept there by means of the central bank’s additions to or subtractions from the quantity of bank reserves. Except on those infrequent occasions when one of the limits becomes binding, changes to the supply of reserves continue to be the chief means by which the central bank conducts monetary policy (Kahn 2010, pp. 13–15).

Had the Fed actually employed IOER to establish a corridor system, its doing so wouldn’t have constituted a radical change. But as we shall see, when the Fed actually put its new tool to work, a corridor system was no longer what it had in mind.

### III. IOER and the 2008 Emergency Economic Stabilization Act

#### III. a. *Fear of Falling*

The 2006 Act would have allowed the Fed to begin paying interest on depository institutions’ reserve balances commencing October 1, 2011. However, the worsening financial crisis of 2008 led to the passage of the Emergency Economic Stabilization Act, which advanced the effective date of the 2006 measure to October 1, 2008.

Fed officials sought and received Congress’s authorization to begin paying interest on reserves three years ahead of the originally planned date for a reason completely unrelated to those that Kohn and others had offered in defense of the original measure. As Ben Bernanke explains in his memoir,

We had initially asked to pay interest on reserves for technical reasons. But in 2008, we needed the authority to solve an increasingly serious problem: the risk that our emergency lending, which had the side effect of increasing bank reserves, would lead short-term interest rates to fall below our federal funds target and thereby cause us to lose control of monetary policy. When banks have lots of reserves, they have less need to borrow from each other, which pushes down the interest rate on that borrowing—the federal funds rate.

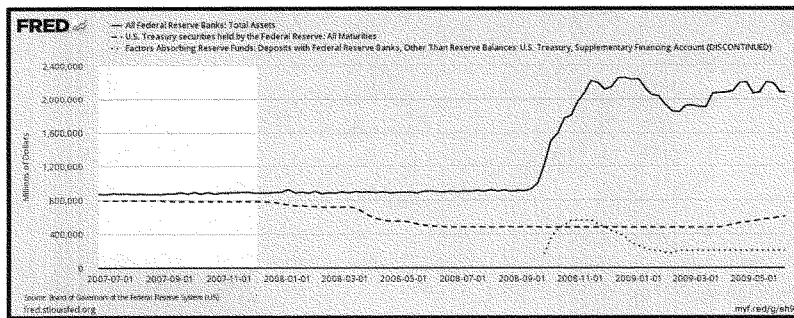
Until this point we had been selling Treasury securities we owned to offset the effect of our [emergency] lending on reserves (the process called sterilization). But as our lending increased, that stopgap response would at some point no longer be

possible because we would run out of Treasuries to sell. At that point, without legislative action, we would be forced to either limit the size of our interventions...or lose the ability to control the federal funds rate, the main instrument of monetary policy. [By] setting the interest rate we paid on reserves *high enough*, we could prevent the federal funds rate from falling too low, *no matter how much [emergency] lending we did* (Bernanke 2015, pp. 325–6; emphasis added).

The same understanding of the Fed's intention in implementing IOER three years ahead of the original, 2006 schedule was conveyed in the Board of Governors' October 6, 2008 press release announcing the Fed's new tool:

The payment of interest on excess reserves will permit the Federal Reserve to expand its balance sheet as necessary to provide the liquidity necessary to support financial stability while implementing the monetary policy that is appropriate in light of the System's macroeconomic objectives of maximum employment and price stability.<sup>3</sup>

The chart below may further clarify the Fed's reasoning. The solid line in it shows the Fed's total assets, while the dashed line shows its Treasury holdings, before and since Lehman's failure. That failure was followed by a dramatic increase in the Fed's emergency lending. But because the Fed's Treasury holdings had already fallen by then to what Fed officials considered a minimal level, they had to find other ways to prevent growth in its balance sheet from undermining its ability to keep new reserves from flooding into the fed funds market. While the Treasury, at the Fed's behest, did its part by diverting funds to a "Supplementary Finance Account" created for the purpose of reducing banks' share of total Fed balances (dotted line), for the most part the Fed was counting on IOER to encourage banks to accumulate excess reserves instead of lending them.



<sup>3</sup> Numerous other Fed sources, including the Federal Reserve Board's October 6, 2008 press release announcing its implementation of IOER, affirm Bernanke's understanding.

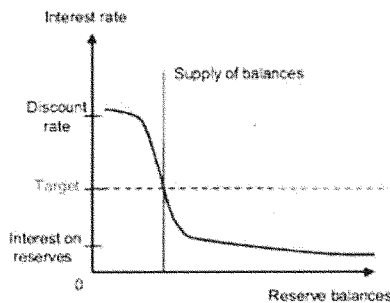


### III. b. From Corridor to Floor

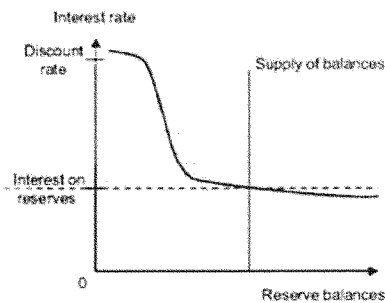
Whether Fed officials realized it at the time or not, their new IOER plan was fundamentally at odds with having the IOER rate serve as the lower-bound of a “corridor” system. In a genuine corridor system, as we’ve seen, the IOER rate is supposed to be set below the monetary authority’s intended policy rate target, and changes in the stock of bank reserves are supposed to keep the rate near that target. In contrast, if IOER is to have the effect of *preventing* additions to the supply of reserves from influencing the fed funds rate, the IOER rate must be set at, if not above, the prevailing fed funds rate.

The Fed’s strategy called, in other words, not for a “corridor” system, but for what Marvin Goodfriend (2002) and others have termed a “floor” system. In a floor system the IOER rate itself becomes the central bank’s policy rate, and hence its chief instrument of monetary control, replacing management of the stock of bank reserves in that role. The difference between the two arrangements is illustrated in the figure below. In a corridor system, as we’ve seen, the target fed funds rate is set between, and typically half-way between, the IOER rate and the discount (or primary credit) rate, and open-market operations are employed to keep the effective funds rate close to its target value. In a floor system, in contrast, the Fed sets an above-market IOER rate equal to its desired fed funds rate target, thereby allowing the IOER rate to serve, in Goodfriend’s words, as both a “floor under which banks would not lend reserves to each other” *and* “a ceiling above which banks would not lend to each other.” The Fed is therefore able to maintain a desired fed funds rate despite flooding the market with bank reserves.

A Corridor System



A Floor System



(Reproduced from Keister 2012)

### III. c. A Dubious Advantage

Would a floor system save the day by allowing a rapidly-expanding Fed to maintain an above-zero fed funds rate? As I've observed elsewhere,<sup>4</sup> the logic underpinning the Fed's plan was more than a little tortured. If there is reason to fear the zero lower bound, it's because, once the fed funds rate reaches zero banks, instead of seeking to exchange excess reserves for other assets, will become indifferent between those alternatives. As Marvin Goodfriend (2002) explains,

banks will never lend reserves to each other at negative (nominal) interest if reserve deposits are costless to store (carry) at the central bank. The zero bound on the nominal interbank rate is a consequence of the fact that a central bank stores bank reserves for free (p. 2).

At the zero lower bound, ordinary Fed rate cuts are no longer possible. Those inclined to identify monetary easing with rate cuts see this as "the" problem. But that's taking a superficial view of matters. The real problem is that, at the zero lower bound, the (zero) yield on bank reserves ceases to be lower than the yield on other short-term assets. Consequently, further additions to the total reserve supply—the Fed's ordinary means of stimulating the economy—no longer inspire further bank lending and deposit creation. Instead, the economy becomes mired in a "liquidity trap," with banks sitting on any fresh reserves that come their way. As Congressman Alan Goldsborough famously put it in 1935, in attempting to induce more lending the Fed would find itself "pushing on a string."

How, in that case, could a *positive* IOER rate help? To be sure, it can solve the "zero lower bound problem" superficially, by establishing a positive fed funds rate floor. But to what end? IOER would then render additions to the stock of bank reserves ineffective as a source of stimulus *before* the fed funds rate reached zero rather than once it did so. Yes, with the help of (positive) IOER, the Fed might set and achieve whatever positive rate target it liked; and it might do so regardless of how many reserves it created. But this "decoupling"<sup>5</sup> of interest rates changes from changes in the scarcity of bank reserves, applauded by Goodfriend (ibid.), Keister (2012), and Keister, Martin, and McAndrews (2008) as a feature of a floor system, is really a bug: the extra freedom it entails comes at a very great price, to wit: the Fed's inability to use its reserve-creating powers to promote additional bank lending and spending.<sup>6</sup>

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<sup>4</sup> Selgin (2017a)

<sup>5</sup> The expression comes from Claudio Borio and Piti Disyatat (2009). Keister, Martin, and McAndrews (2008) instead refer, approvingly, to a floor system as a device for "Divorcing Money from Monetary Policy."

<sup>6</sup> These remarks, once again, refer only to the use of a positive IOER rate to maintain an above-zero interest rate floor. A *negative* IOER rate can, in contrast, serve in principle to get around the zero lower bound problem by allowing a central bank to maintain a positive opportunity cost of reserve holding even when short-term market rates fall to zero. It is, to say the least, hardly possible that *either* negative or positive (but not zero!) IOER can serve equally well to get around the zero lower bound problem: if one theory of how IOER does this is correct, the other is, presumably, mistaken.

When driving an automobile, one can get away with only so many combinations of steering-wheel movements on the one hand and the gas pedal pressure on the other. Wouldn't it be nice to be able to have complete freedom to step on the gas, and yet steer whichever way we like? Well, there's a solution: put the transmission in neutral! The hitch of course is that, while one can now steer any way one likes, and stomp on the gas all one likes, one cannot get very far doing either.

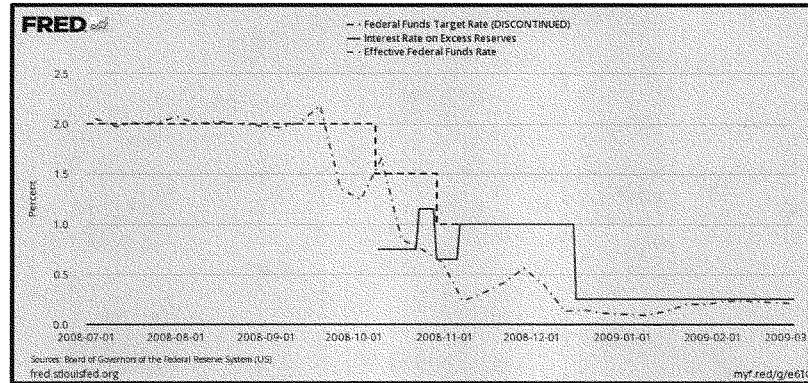
An above-market IOER rate can likewise allow the Fed to steer the fed funds rate any way it likes, while stepping on the reserve-creation peddle as hard as it likes, only by putting the usual monetary transmission mechanism in neutral. For the usual zero-lower-bound liquidity trap, it substitutes an above-zero liquidity trap in which monetary policy remains, despite appearances to the contrary, more-or-less equally impotent. The zero lower bound problem is thus avoided, but in a way that may still leave the economy in a depressed state, with little scope for monetary policy stimulus of the old-fashioned sort. It is as if (to offer one last simile), out of concern for would-be jumpers, the designers of a skyscraper decided to construct a broad concrete veranda around their building's second floor, to prevent them from ever hitting the ground!

Just how the Fed proposed to stimulate the economy with its ordinary monetary policy transmission mechanism stuck in neutral, as it were, was a challenging question Fed authorities would eventually have to answer. For the time being, however, stimulating the economy wasn't their concern. Instead, their concern was to *avoid* stimulating the economy unintentionally. For that purpose, IOER, administered according to the requirements of a floor system, would serve the Fed's needs well. Indeed, in retrospect, it was to serve them all too well.

### *III. d. From Floor to Ceiling*

Although the Fed's plans called for a floor rather than a corridor operating system, with the IOER rate set high enough to encourage banks to accumulate excess reserves, the Board of Governors appears to have failed at first to grasp this necessity. Instead, in the same press release announcing its desire to employ IOER to bolster the fed funds rate, it declared its intention to set the IOER rate at a level equal to "the lowest targeted federal funds rate for each reserve maintenance period less 75 basis points."

Just how an IOER rate set 75 basis points below "the lowest targeted federal funds rate" could possibly assist the Fed in achieving its immediate monetary policy goal, and specifically how it could keep the effective fed funds rate from eventually slipping as much as 75 basis points below the Fed's target, the press release didn't explain. Nor could it have, since IOER could only keep the fed funds rate from falling below the Fed's target if the IOER rate was set equal to, or rather (for reasons we'll come to) above, that target. Partly for this very reason, the effective fed funds rate continued to decline, as can be seen in the next chart.



The Fed's announcement provided, however, that "the formula for the interest rate on excess balances may be adjusted subsequently in light of experience and evolving market conditions." The Fed was, unsurprisingly, quick to take advantage of this clause, which it did by reducing the gap between the IOER rate and its fed funds target, first to 35 basis points, and finally, on November 6, 2008, to zero. However, the gap between the Fed's rate target and the effective fed funds rate had itself continued to grow in the meantime. The end result of the Fed's maneuvers, therefore, was an IOER rate well *above* what banks might actually gain by lending federal funds.

That IOER failed to keep the fed funds rate on target even once the IOER rate was set equal to that target was both inconsistent with the way a floor system was supposed to operate, and a source of considerable disappointment to Fed officials and economists. Blame for it has been placed on the fact that, in addition to banks, various GSEs, including Fannie Mae, Freddy Mac, and the Federal Home Loan Banks, keep deposit balances at the Fed, but aren't eligible for interest on those balances.<sup>7</sup> The GSEs' access to the fed funds market therefore creates an arbitrage opportunity Fed officials didn't anticipate, with GSEs lending fed funds overnight to banks in exchange for a share of the latter's IOER earnings. When the IOER rate was set at 25 basis points, for example, one of the Federal Home Loan Banks might lend funds overnight to a commercial bank for less than 25 basis points, allowing the commercial bank to profit from the spread, while securing for itself a return greater than the zero rate it would earn if it just held on to its Fed balance.

Consequently, instead of getting the solid floor system it wanted, the Fed had to settle instead for a "leaky" system. Indeed, because the effective fed funds rate tended to fall below the IOER rate, the latter ended up looking less like a floor than like a ceiling—just the opposite of corridor arrangement. When, in mid-December 2015, the Fed began

<sup>7</sup> See Kahn (2010).

making use of a new overnight reverse repurchase agreement (ON-RRP) facility to establish what Stephen Williamson (2016) has called a “floor-with-sub-floor” system, with the effective fed funds rate trading within a target “range” defined by the IOER rate (floor), and the ON-RRP (subfloor), the resemblance of the Fed’s new system to a corridor system gone topsy-turvy became all the more complete.

#### IV. Setting the IOER Rate

##### *IV. a. Original Intent: A Below-Market IOER Rate*

Having shifted, between 2006 and 2008, from an IOER scheme aimed at ending the implicit taxation of bank reserves and perhaps at establishing a corridor system of monetary control, to one aimed at establishing a floor system, however leaky, the Fed was bending the law. For the new policy marked a radical change, not just from what the authors of the 2006 legislation had envisioned, but from what that legislation provided for in fact.

The pre-crisis opinion had been that IOER should be used cautiously, with the IOER rate set low enough to avoid making reserves seem “more attractive relative to alternative short-term assets.” Otherwise, that opinion held, IOER, instead of simplifying monetary policy, would further complicate it (Weiner 1985, p. 30).<sup>8</sup>

Such was clearly Federal Reserve Governor Laurence H. Meyer’s understanding when, in arguing the case for allowing the Fed pay interest on reserves before the House Banking Committee in 2000, he explained that

If the bill becomes law, the Federal Reserve would likely pay an interest rate on required reserve balances close to the rate on other risk-free money market instruments, such as repurchase agreements. This rate is usually a little less than the interest rate on federal funds transactions, which are uncollateralized overnight loans of reserves in the interbank market (Meyer 2000, p. 10).

What Governor Meyer considered an appropriate proxy for “the general level of short-term interest rates” in 2000 was presumably still appropriate in 2006. Since unsecured overnight rates, such as the federal funds rate and the London Interbank Overnight Rate (LIBOR), entail greater risk than overnight repos, to abide by the intent of the 2006 and 2008 laws, the Fed would have to keep the interest rates paid on reserve balances somewhat *below* these somewhat more risky overnight interbank lending rates. In this way, as one Fed official explained when the 2006 legislation was being considered, banks would have no reason “to significantly shift their financial resources to take advantage of this [the IOER] rate” (Eubanks 2002, p. 11). In particular, banks would continue to keep only such reserve balances as they needed to meet their legal and

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<sup>8</sup> See also Laurent and Mote (N.d.).

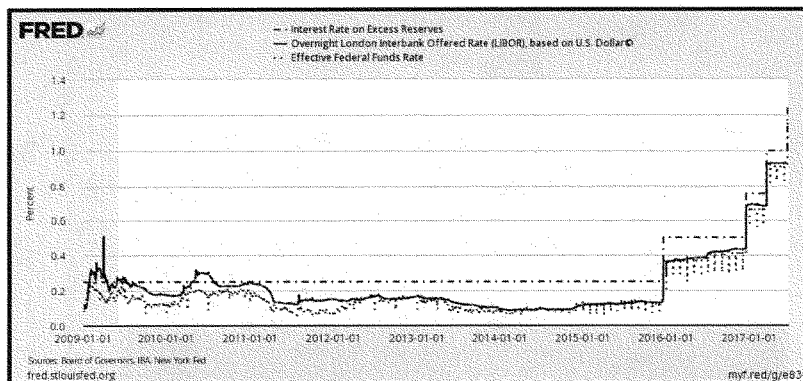
clearing-balance requirements. The main difference reformers anticipated was that they would no longer bother using sweep accounts to avoid an implicit reserve tax.

The provisions of the 2006 legislation reflected these same considerations. According to Title II of that measure, the Fed might pay interest on depository institutions' reserve balances "at a rate or rates not to exceed the general level of short-term interest rates." The 2008 Financial Services Regulatory Relief Act left this language unaltered.

#### *IV.b. Above the Law?*

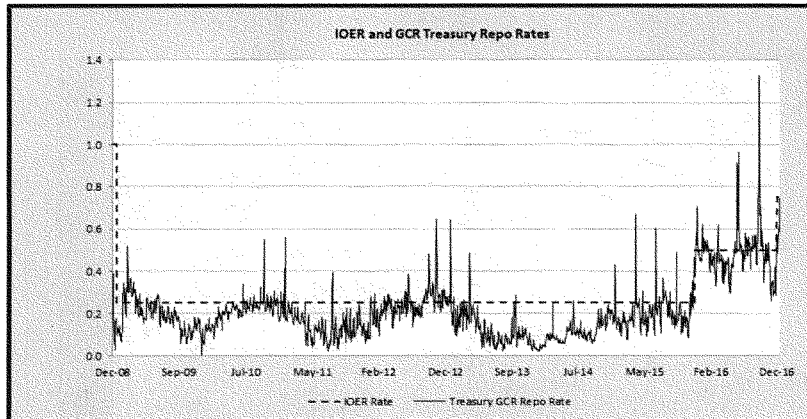
Fed officials therefore found themselves in a quandary. As we've seen, they wanted to be able to resort to IOER three years ahead of schedule precisely for the purpose of making excess reserves "attractive relative to alternative short-term assets." That meant setting the IOER rate *above* the going, but still positive, equilibrium fed funds rate. Indeed, given the "leakiness" of the Fed's floor system, the IOER rate would have to be set considerably above the Fed's target rate. In practice that also meant keeping the IOER rate above other, comparable market-based short-term interest rates. According to the law, on the other hand, the Fed was only supposed to pay interest on bank reserve balances at a rate "not to exceed the general level of short-term interest rates."

That the Fed did in fact settle on an IOER rate above comparable *market* rates can be seen in the next sequence of charts, the first of which compares its IOER rate to both the effective federal funds and the LIBOR rate:

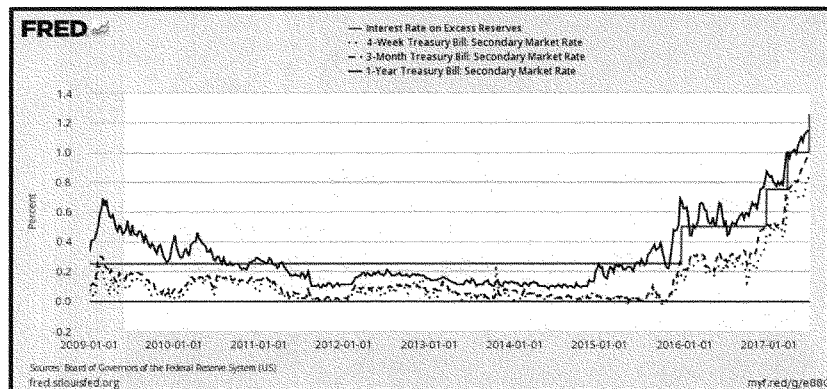


Because the fed funds and LIBOR rates are rates for unsecured overnight loans, they include a small risk component, while the IOER rate is equivalent to a risk-free overnight rate. For that reason, and as Governor Meyers suggested in his previously-mentioned testimony, the rate implicit in overnight, Treasury-secured repurchase

agreements might be a more appropriate market-rate benchmark. That rate has also tended to fall below the IOER rate.



Finally, it's instructive to compare the IOER rate to rates on Treasury bills of various maturities. The latter rates should, for obvious reasons, generally be above equivalent, risk-free overnight rates, according to the securities' term to maturity. Yet, as the next chart shows, rates on both 4-week and 3 month T-bills have also been persistently, and often substantially, below the IOER rate. Indeed, from the spring of 2011 through mid-summer of 2015, even rates on 1-year Treasury bills remained below, and generally well below, the IOER rate:



In short, it's impossible to reconcile the Federal Reserve's setting of its IOER rate with any *reasonable* understanding of the law's stipulation that it is "not to exceed the general level of short-term interest rates."

IV. c. *"One of these rates is not like the others..."*

In an apparent attempt to legalize the Fed's IOER rate settings after the fact, Fed officials, in drafting the final rules implementing the 2008 statute, as published in the *Federal Register* on June 22, 2015, determined that for that purpose

"short-term interest rates" are rates on obligations with maturities of no more than one year, such as the primary credit rate and rates on term federal funds, term repurchase agreements, commercial paper, term Eurodollar deposits, and other similar instruments (Regulation D: Reserve Requirements for Depository Institutions 2015, p. 35567).

While most of the listed rates are unobjectionable, even if they fail to include overnight obligations (which are, after all, closer equivalents to reserve balances than term obligations are), the presence of the primary credit rate is a glaring anomaly, for that's the discount rate that the Fed charges sound banks for short term emergency loans. As such it isn't a market rate at all but one set administratively by the Fed's Board of Governors. Moreover, since 2003 the Fed has always set its primary credit rate "above the usual level of short-term market interest rates" (Board of Governors 2017b). Since the Fed began paying interest on reserves it has also deliberately set its primary credit rate above the IOER rate.<sup>9</sup> The Fed has thus found a way by which to claim, with an implicit appeal to Chevron deference, that its IOER rate settings have after all been consistent with the requirements of the 2006 law!<sup>10</sup>

That the Fed should thumb its nose thus at the statute granting it the authority to pay interest on reserves would be regrettable enough if its doing so had only benign consequences. Yet that is far from being the case. On the contrary: by bending the law to conform to its plan to make the accumulation of reserve balances more attractive to banks than other forms of investment, the Fed fundamentally altered the workings of the U.S. monetary system, with grave consequences for the U.S. economy.

## V. IOER and Reserve Hoarding

<sup>9</sup> Since the beginning of 2010 the Fed has maintained a fixed spread of 50 basis points between the IOER rate and the primary credit rate by adjusting both rates together.

<sup>10</sup> "Chevron deference" is the controversial principle, put into effect by the Supreme Court's 1984 decision in *Chevron USA v. Natural Resources Defense Council, Inc.*, that courts should defer to government agencies' own interpretations of statutes establishing new agency obligations and powers. In *City of Arlington v. FCC* (2013) the Court held, furthermore, that government agencies deserve deference even when it comes to interpreting statutes establishing the scope of their own authority!



Many observers have assumed that the seemingly modest rate the Fed has paid on banks' excess reserve balances, which has so far never exceeded 125 basis points, and which was a mere 25 basis points from December 2008 until December 2015, has never been high enough to have had any substantial bearing on banks' decision making, and particularly on either the total supply or the allocation of credit.

But as we've seen, these seemingly low IOER rates have not been low *relative to comparable market rates*. For that reason, their influence on banks' behavior has been anything but modest. As Simon Potter (2015), a Federal Reserve Bank of New York Vice President, and head of its Market Group, explains,

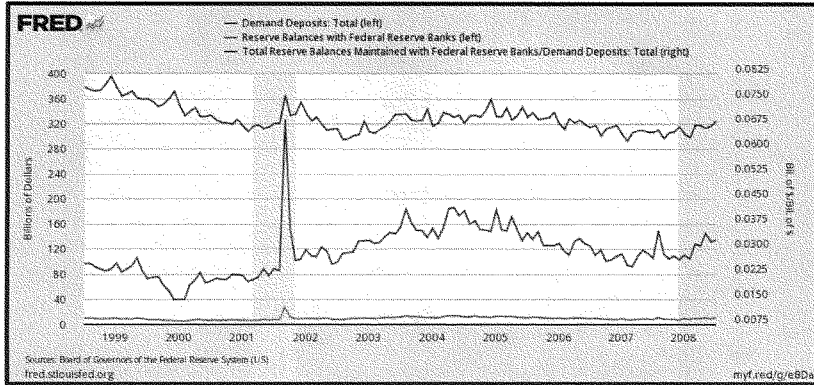
The IOER rate is essentially the rate of return earned by a bank on a riskless overnight deposit held at the Fed, thus representing the opportunity cost to a bank of using its funds in an alternative manner, such as making a loan or purchasing a security. In principle, no bank would want to deploy its funds in a way that earned less than what can be earned from its balances maintained at the Fed.

Thanks to IOER, banks have refrained from acquiring assets bearing a net return below what they might earn simply by retaining Fed reserve balances. Some, indeed, have found it worthwhile to actively acquire Fed balances for the sake of arbitraging the spread between the return on such balances and private-market borrowing costs. Because IOER was implemented for the express purpose of getting banks to accumulate excess reserves, these outcomes should not surprise anyone.

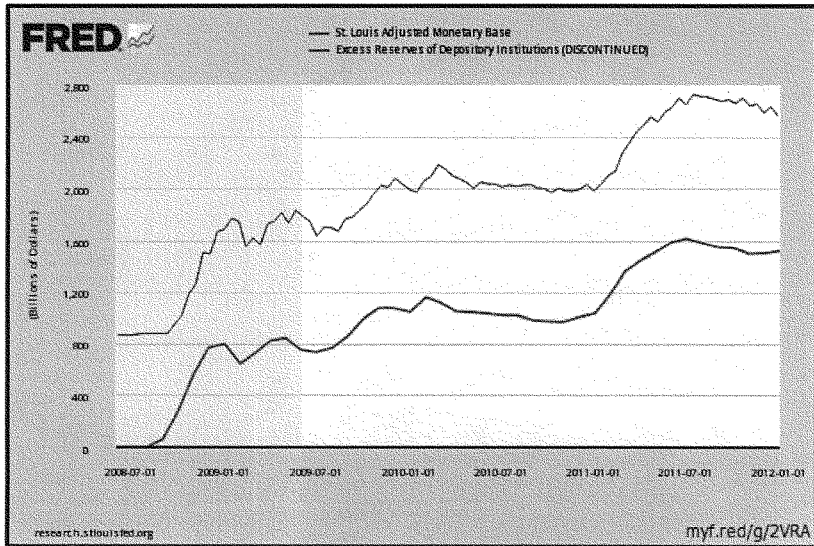
#### *V. a. The Accumulation and Distribution of Excess Reserves*

The most obvious consequence of IOER has been unprecedented growth in banks' excess reserves balances, meaning the Fed balances they hold beyond those serving, together with banks' holdings of vault cash, to meet their minimum legal reserve requirements.

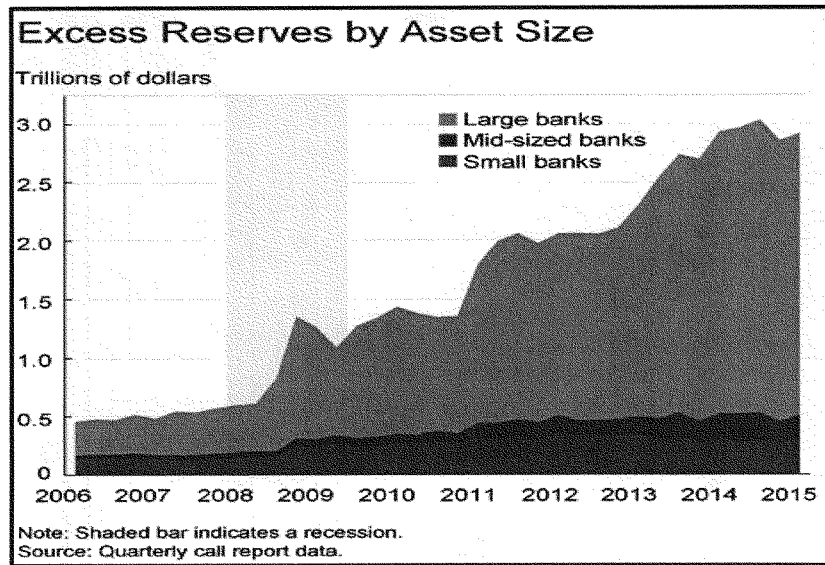
In the two decades prior to October 2008, banks generally held between \$1 and \$2 billion in excess reserves, in part for the sake of avoiding shortfalls from their required reserves, but mainly to avoid relatively costly clearing overdrafts. (The few exceptions consisted of short-lived spikes in excess reserves following crises, like that of September 11, 2001, when banks briefly held over \$19 trillion in excess reserves.) Banks' minimum reserve requirements were, in contrast, largely met by their holdings of vault cash. Between them, minimum reserve requirements and banks' demand for excess reserves for settlement purposes determined banks' overall need for reserve balances, together with their desired ratio of such balances to their demand deposits. As the chart below shows, reserve balances normally amounted to between one-fifth and two-fifths of one percent of demand deposits only.



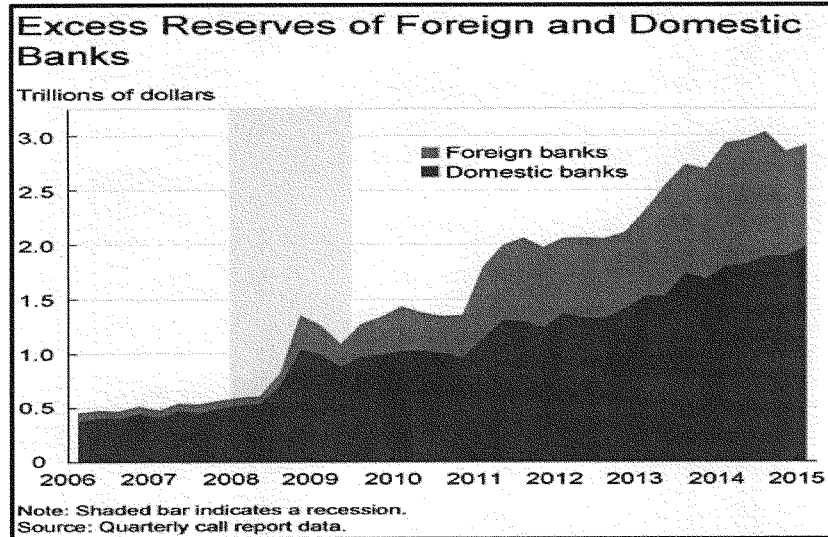
As the next chart shows, after Lehman Brothers' failure, banks' excess reserve holdings began growing in lock-step with growth in the Fed's balance sheet, starting with growth fueled by the Fed's post-Lehman emergency lending, and continuing, after December 2008, with its several rounds of large-scale asset purchases (LSAPs). By August 2014 excess reserves, which had rarely surpassed \$2 billion before the crisis, had risen to almost \$2.7 trillion.



That banks held on to reserves that came their way was a predictable consequence of the Fed's above-market IOER rate.<sup>11</sup> Still, banks didn't all take part equally in the vast reserve buildup. Instead, as the next set of charts shows, a very large share of it went to the very largest U.S. banks or to U.S. branches of foreign banks. As of early 2015, the top 25 U.S. banks, by asset size, held more than half of all outstanding bank reserves, with the top three alone holding 21 percent of the total. Foreign bank branches accounted for most of the rest. The cash assets of small U.S. banks, in contrast, rose only modestly.



<sup>11</sup> For theories, see Dutkowsky and VanHoose (2017) and Ireland (2012). According to the latter's DSGE model, in the absence of positive costs of managing large excess reserve holdings banks receiving interest on reserves at an above-market rate will wish to hold "an unboundedly large stock of reserves." To avoid that outcome the IOER rate must be set slightly *below* the market rate (*ibid.*, pp. 28–9). Bewley (1980) and Sargent and Wallace (1985) were among the first authors to draw attention to the problem of reserve demand indeterminacy in an IOER regime with a return on bank reserves equal to that on non-reserve assets.



That the very largest banks secured such a large share of the total accumulation of excess reserves is partly explained by the fact that those banks include some of the primary dealers that served as the Fed's immediate counterparties in its asset purchases (Craig, Millington, and Zito 2014). Having thus had "first dibs" on new reserves the Fed created, primary dealer banks simply refrained from letting go of reserves they acquired. That practice was, of course, quite contrary to what primary dealers were normally expected to do, and to what they generally did do before the crisis, when the Fed was still relying on its traditional means of monetary control. Indeed, in the early stages of the subprime crisis, Fed officials worried that the collapse of ailing primary dealers would prevent them from serving as reliable conduits through which fresh reserves would make their way from the Fed to the rest of the banking system (e.g., Kohn 2009). Now, paradoxically, IOER was itself serving to close the same conduits, along with much of the rest of the interbank market, but was doing so deliberately as part of the Fed's new monetary control strategy.

As for U.S. branches of foreign-owned banks, because many aren't eligible for deposit insurance, they also aren't subject to FDIC premium assessments based on their total assets, including the reserve balances they hold. For that reason, and also because many of their parent companies enjoy much lower net interest margins than U.S. banks, they've found it especially profitable to acquire fed funds for the sake of arbitraging the difference between the Fed's IOER rate and lower private-market arbitrage rates. In consequence these banks ended up playing a particularly important part in keeping

growth in the total quantity of reserve balances from contributing to corresponding growth in overall bank lending.

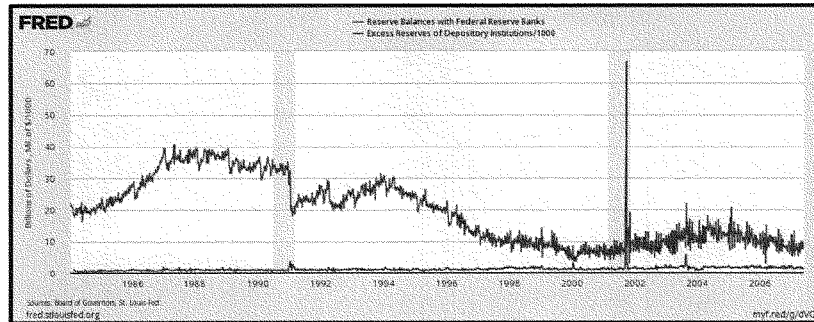
*V. b. Excess Reserves and the Fed's Balance Sheet*

Some insist that, instead of stemming from the Fed's decision to pay interest on excess reserves, the post-Lehman accumulation of excess bank reserves was an inevitable consequence of the Fed's asset purchases. In an influential *Liberty Street* post, for example, Todd Keister and Gaetona Antinolfi (2012) criticized Alan Blinder (2012) and others for claiming that lowering the IOER rate would encourage banks to lend more and thereby reduce their excess reserve balances:

Because lowering the interest rate paid on reserves wouldn't change the quantity of assets held by the Fed, it must not change the total size of the monetary base either. Moreover, lowering this interest rate to zero (or even slightly below zero) is unlikely to induce banks, firms, or households to start holding large quantities of currency. It follows, therefore, that lowering the interest rate paid on excess reserves will not have any meaningful effect on the quantity of balances banks hold on deposit at the Fed. ... In fact, the total quantity of reserve balances held by banks conveys no information about their lending activities—it simply reflects the Federal Reserve's decisions on how many assets to acquire (Keister and Antinolfi 2012).

It's of course true, as any money and banking textbook will affirm, that banks cannot alter the total quantity of reserve balances simply by trading them for other assets, as doing so only transfer the balances to other banks. But the question isn't whether a lower IOER rate would reduce total reserves. It's whether a lowered rate can result in a lower quantity of *excess* reserves. The answer to that question is “yes,” because, as the same textbooks also explain, as banks trade unwanted reserves for other assets, they also contribute to the growth of total banking system deposits; the fact that unwanted reserves get passed on like so many hot potatoes only makes deposits grow that much more rapidly. The growth of total deposits serves in turn to convert former excess reserves into required reserves, where “required” means required either to meet minimum legal requirements or for banks' clearing needs.

That, at least, is what always happened before the Fed began encouraging banks to cling to excess reserves. For example, as the chart below shows, prior to October 2008, banks routinely disposed of unwanted excess reserves in the manner just described, thereby keeping system excess reserves at trivial levels, and doing so despite additions to the total supply of bank reserves that were, by pre-2008 standards at least, far from trivial.



It follows that, when banks hold a large quantity of excess reserves, that fact actually conveys very significant “information about their lending activities.” Specifically, it tells us that they have refrained from engaging in such activities to some considerable extent.

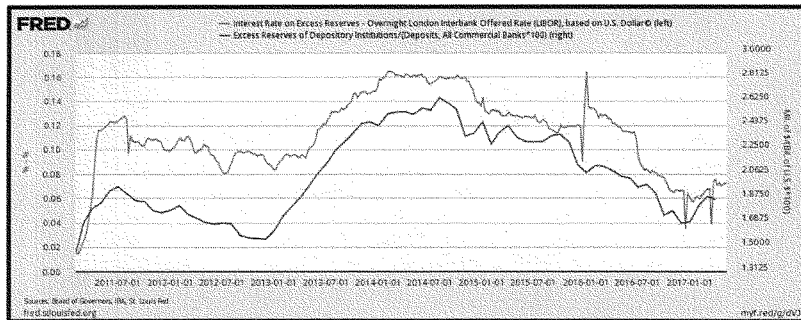
In reply to these criticisms, Mr. Keister has suggested (in personal correspondence) that, IOER or no IOER, the unprecedented scale of the Fed’s post-Lehman balance sheet growth would have rendered the traditional means by which banks disposed of unwanted excess reserves inoperable, because banks couldn’t possibly achieve the expansion in their total assets and deposit liabilities required to convert so vast an increase in total reserves into an equally vast increase in required reserves. But this counter-argument is also contradicted by relevant historical evidence, consisting of instances of hyperinflation in which central banks expanded their balance sheets on a scale much larger still than that seen in the U.S. since 2008. During the notorious Weimar hyperinflation, for example, the (proportional) growth in German bank reserves far exceeded that witnessed in the U.S. since Lehman’s bankruptcy. Yet, according to Frank D. Graham (1930, p. 68), Germany’s banks, far from accumulating excess reserves, increased their lending more than proportionately. “It would appear,” Graham writes, “that the commercial banks extended loans throughout the period of post-war inflation considerably in excess of a proportionate relationship with the increase in the monetary base. ... The increase in deposits issuing from loans was especially marked in 1922 and till stabilization in 1923.”

It doesn’t follow, of course, that, had it not been for interest on excess reserves, the Fed’s post-Lehman asset purchases would have led to hyperinflation. Instead, Fed officials would have not have felt compelled to purchase as many assets as they did; in any event, they would have stopped purchasing assets once confronted with evidence that the inflation rate was in danger of exceeding its target. As it was, by relying on IOER to discourage banks from dispensing with excess reserves, the Fed ended up falling short of, instead of surpassing, its inflation target. That outcome came as a surprise to those accustomed to the workings of the Fed’s traditional monetary control framework. But in

the context of its new IOER framework, any tendency for the Fed's asset purchases to raise prices would itself have been surprising.

#### V. c. Reserve Demand and Opportunity Cost

Final proof, should it be needed, of the bearing of IOER on banks' willingness to accumulate excess reserves comes from consideration of how that willingness varied with changes in the relationship between the IOER rate and corresponding market rates. If banks' demand for excess reserves is driven by the yield on such reserves compared to that on other assets, then the banking system excess reserve ratio—the ratio of total excess reserves to total bank deposits—should vary with the difference between the IOER rate and comparable short term market rates, such as the overnight LIBOR rate. As the next chart shows, this has indeed clearly been the case.



### VI. IOER and Interbank Lending

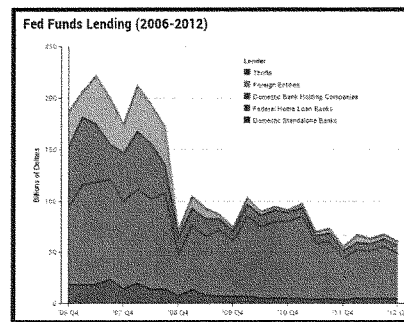
As we've seen, when the Fed began paying interest on bank reserves, its immediate concern was to keep its emergency lending from causing the fed funds rate to drop below 1.5 percent—the target it set when it announced its IOER plan. To repeat Ben Bernanke's words once again, "by setting the interest rate we paid on reserves high enough, we could prevent the federal funds rate from falling too low, no matter how much [emergency] lending we did (Bernanke, 2015)."<sup>12</sup>

But interest on reserves could not discourage banks from placing *newly-created* reserves into the fed funds market without discouraging them from supplying *any* funds to that market: if a dollar of reserves that landed in a bank's Fed account as a result of the Fed's post-Lehman emergency lending earned more sitting in that account than it could

<sup>12</sup> "Interbank activity need not suffer regardless of the size of reserves, as long as the central bank makes sure that there is an opportunity cost to holding reserves, by remunerating them at a rate below the market rate" (Borio and Disyatat 2009, p. 18n29).

earn if lent to another bank overnight, the same was true of a dollar of reserves held beforehand. Consequently, as the next chart shows, IOER served, not only to keep fresh reserves from lowering the fed funds rate, but to dramatically reduce the total volume of lending on the fed funds market: whereas financial institutions lent over \$200 billion on the fed funds market during the last quarter of 2007, by the end of 2012 that figure has fallen to just \$60 billion (Afonso, Entz, and LeSueur 2013).

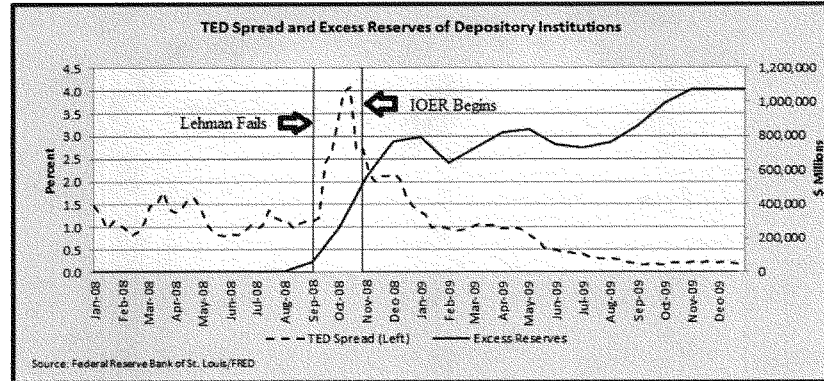
As was to be expected, banks and bank holding companies (BHCs) that were eligible for IOER almost completely stopped lending overnight funds. Only the Federal Home Loan banks and other GSEs continued to lend as much as ever, for the sake of securing a share of banks' IOER earnings. The fed funds market thus ceased to function, as it had for decades, as banks' preferred and most reliable source of last-minute liquidity, having instead been transformed into a mere vehicle for bank-to-GSE interest-rate arbitrage.



#### VI. b. IOER vs. Perceived Counterparty Risk

Although some have attributed the decline in fed funds lending to a post-Lehman increase in perceived counterparty risk, that increase is no more capable of explaining the *persistent* decline in interbank lending than it is capable of explaining banks' *persistent* accumulation of excess reserves. While the TED spread—a popular measure of the perceived counterparty risk, equal to the difference between the interest rate on short-term interbank lending and the interest rate on Treasury securities—spiked at the time of Lehman's failure, it began to decline soon afterwards when the Fed decided to come to AIG's rescue, eventually falling to levels even lower than those that prevailed before the crisis. Interbank lending, on the other hand, never recovered. The Fed's decision to pay interest on excess reserves therefore appears to have been the fundamental cause of the enduring post-Lehman decline in such lending.

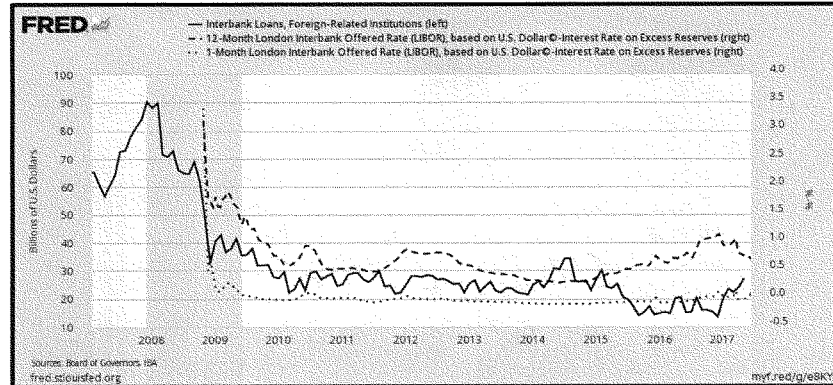




The timing of the substantial rise in banks' excess reserves reinforces the last conclusion. Although banks accumulated excess reserves immediately following Lehman's failure, most of the increase occurred after the Fed began paying interest on reserves. Overall, the evidence suggests that, while an increased fear of counterparty risk accounted for banks' increased excess reserve holdings immediately following Lehman's failure, IOER was responsible for the subsequent more substantial and lasting increase in those holdings.<sup>13</sup>

Finally, the close relationship between the total volume of interbank lending and the opportunity cost of reserves holding, as measured by the difference between the interbank lending rates and the IOER rate, also supports the view that IOER drove the decline in interbank lending. Although the relationship is similar for all banks, it is clearest for foreign banks which, as we've seen, were especially tempted to accumulate excess reserves. Particularly striking is the almost exact coincidence of the precipitous decline in the opportunity cost of reserves coinciding with the introduction of IOER and an equally precipitous, initial decline in interbank loans.

<sup>13</sup> Bech et al. (2015) offer interesting insights concerning the combined effects on wholesale lending of the fears raised by Lehman's failure and the Fed's IOER announcement.



#### VI. c. From Lender to Borrower of First Resort

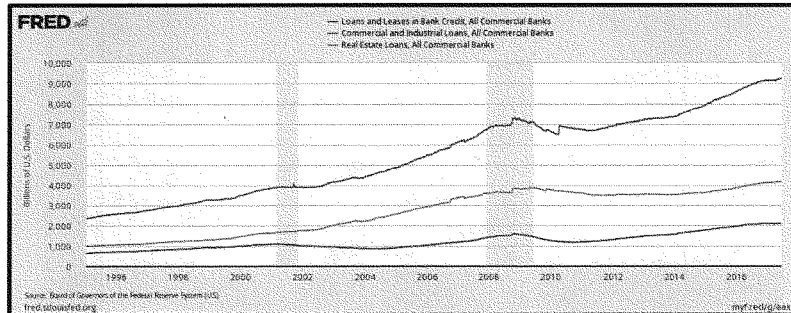
The collapse of interbank lending created a further motive, beyond the return on reserves itself, for banks to accumulate excess reserves, as banks that once routinely relied on overnight unsecured loans to meet their liquidity needs discovered that, owing to the substantial decline in the availability of fed funds, doing so was no longer prudent. Because that decline at first caught many banks by surprise, its immediate effect was a sharp spike, on October 7, 2008, in the fed funds rate, which rose to 2.97 percent, or almost twice the Fed's target at the time. Banks adapted by raising their excess reserve holdings so as to have sufficient precautionary reserves to cover those reserve needs that they had previously met by borrowing federal funds.

As Gara Afonso, Anna Kovner, and Antoinette Schoar (2010, p. 1) point out, until these changes came about, the fed funds market had long served as "the most immediate source of liquidity for regulated banks in the U.S." Consequently any disruption of that market could "lead to inadequate allocation of capital and lack of risk sharing between banks." In extreme cases, they add, it might "even trigger bank runs." By paying IOER at above-market rates, the Fed, which is supposed to serve as a lender of last resort, unwittingly became both a *borrower* of first resort and the agent of destruction of banks' traditional, first-resort source of emergency funds.

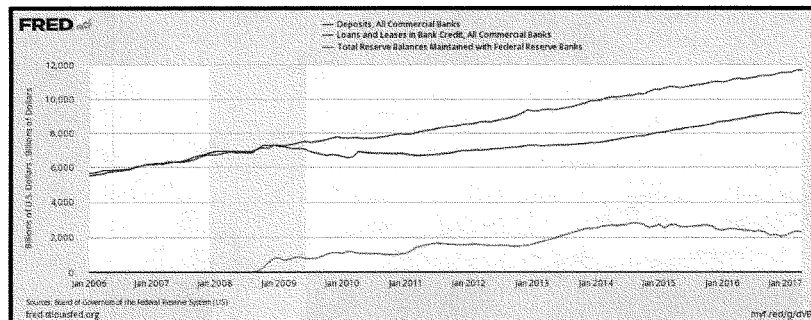
### VII. IOER and Retail Bank Lending

#### VII. a. Lending Before and Since the Crisis

Between the week just before the Fed began paying interest on bank reserves, when it reached its pre-crisis peak, and the third week of March 2009, when it reached its post-crisis nadir, overall U.S. commercial bank lending declined from over \$7.25 trillion to about \$6.5 trillion—a decline of \$1.25 trillion. Although reduced real estate lending accounted for the greatest part of this decline, other kinds of lending, including business lending, also fell sharply.



Although lending has recovered to a considerable extent since the crisis, at least relative to its pre-subprime boom trend, this recovery was painfully slow. Furthermore it masks an enduring and substantial post-crisis decline in the ratio of overall bank lending (“loans and leases”) to total bank deposits. Whereas total bank lending tended to match total bank deposits in the years leading to the crisis, since then, and specifically since IOER was introduced, it has declined to about 80 percent of deposits. Over that same period, bank reserves, as a percentage of total bank deposits, have increased from trivial levels to roughly 20 percent of bank deposits. In short, as a matter of simple balance-sheet arithmetic, the rise in banks’ holdings of (mainly) excess reserves has gone hand-in-hand with a corresponding decline in bank lending.



#### VII. b. The Direct Influence of IOER on Bank Lending

But does this correspondence mean that IOER was actually responsible for the decline in retail bank lending as a share of bank deposits? Many insist that IOER rates have been too low, compared to the rates on commercial bank loans, to have had more than a minor influence on bank lending. For example, Ben Bernanke and Donald Kohn (2016) observe that, during the long interval when the IOER rate stood at 25 basis points, “the only potential loans that would have been affected by the Fed’s payment of interest [on reserves] are those with risk-adjusted short-term returns between precisely zero and one-quarter percent.”

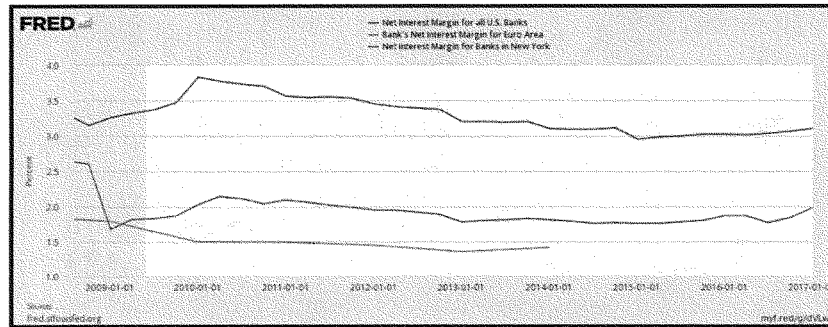
That view is, however, mistaken, on both empirical and theoretical grounds.

First of all, as we’ve seen, the growth in banks’ excess reserve holdings was not an inevitable response to growth in the Fed’s balance sheet: banks are always materially capable of reducing their excess reserve holdings, collectively as well as individually, either by making loans or by buying securities. It follows that the existence of substantial excess reserve balances is *ipso-facto* proof that the banks that acquired those reserves considered them more desirable than any other assets they might have acquired.

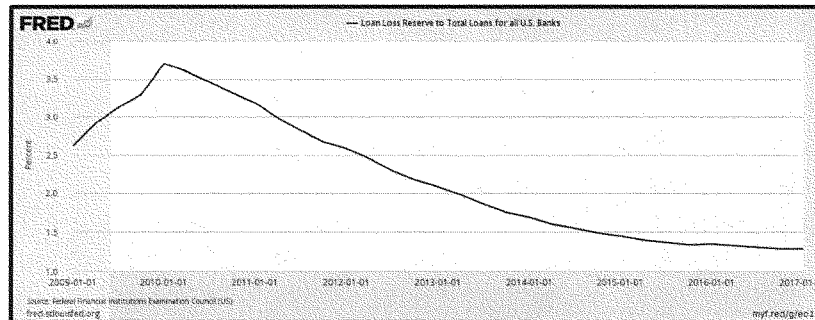
Standard microeconomic theory suggests, furthermore, that in equilibrium all of a banks’ various assets should have, not the same marginal return, but the same marginal *net* return. Consequently, in theory at least, for any bank that holds excess reserves, the marginal net return on lending must not be any greater than the marginal return on such reserves. That means in turn that, if the return on reserves goes up, total bank lending must decline enough to once again make the marginal net return on loans the same as the return on reserves. To put this another way, although reduced short-term lending, and interbank lending especially, may be the first and most obvious consequence of an increase in bank reserves’ relative yield, the eventual consequences will also include some reduction in longer-term bank lending.

Can this theory account for the apparent decline in lending as a share of deposits? It can, provided one understands, first of all, that not all banks enjoy equally high gross returns on lending. That fact is at least roughly reflected in different banks’ net interest margins: the difference between the interest they earn and the interest they pay on bank deposits, expressed as a percentage of bank assets. Because bank deposit rates have themselves been extremely low since the crisis, and are in many cases at zero, banks’ net interest margins supply a rough indication of their gross interest returns; and those margins have in fact been considerably lower for the largest U.S. banks, and lower still for foreign banks, than they have been for U.S. commercial banks as a whole. Whereas the net interest margin for all U.S. commercial banks has steadily declined from not quite 4 percent in early 2010 to just over 3 percent in 2017, the margin for banks in New York, which is home to the very largest banks, has been around 2 percent for most of that same period, while that for foreign banks generally has generally been less than 1.5 percent.

And it is, as we've seen, the very large domestic banks, as well as foreign bank branches, that have been holding most of the outstanding excess reserves.

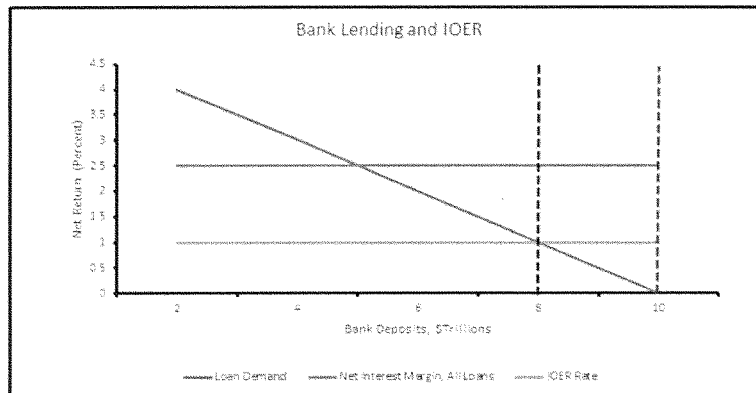


Even 150 basis points is many times 25 basis points. But that's still not the right comparison, because there are substantial non-interest expenses involved in making loans, whereas the only non-interest expense of holding Fed balances consists of FDIC premiums assessed against a bank's total assets—and even that cost does not apply to most foreign bank branches. ECB area bank operating expenses, for example, are equal to about 60 percent of their interest income. And because borrowers sometimes default, and banks must make allowances for such defaults, loan loss provisions further reduce the net return on bank loans (Noizet 2016). As the next chart shows, those provisions reached a peak of 3.7 percent of total bank assets at the beginning of 2010, from which they've gradually fallen to their present level of 1.29 percent. Taking such losses as well as other costs of lending into account, it's no longer at all difficult to understand how a modest IOER rate might have made holding excess reserves seem more lucrative than granting a loan at a considerably higher non-risk-adjusted rate.



Nor is that all. Banks' net interest margins are a measure of the return on their entire loan portfolios. But allowing that the demand schedule for bank loans is downward-sloping, the return on a banks' *marginal* loan is necessarily lower than that on its loan portfolio as a whole; and it's this marginal return, net of both the interest and the non-interest expense associated with the marginal loan, that is supposed, in equilibrium, to be no higher than the bank's net marginal return on other assets, including any excess reserves it holds. Consequently, the mere existence of a positive difference between a banks' net interest margin and the IOER rate, even after allowing for the noninterest cost of loans, is perfectly consistent with the theory that banks' have found it more profitable to accumulate excess reserves than to part with those reserves by lending more.

The diagram below illustrates the last point. In it, the blue line represents the downward-sloping marginal revenue schedule for loans confronting the banking system, while the horizontal grey line represents the IOER rate, here assumed to be 100 basis points. For simplicity, I ignore banks' noninterest expenses altogether, while assuming that the Fed adjusts the total stock of reserves so as to keep total bank deposits constant.



In that case, assuming that they have \$10 trillion in deposits at their disposal, the banks will collectively lend \$8 trillion, while maintaining \$2 trillion in excess reserves. But although the net return on the marginal loan is the same as the IOER rate, the banking system net interest margin, represented here by the orange line, will necessarily be higher than the IOER rate. Reducing the IOER rate to zero, on the other hand, encourages banks to lend 100 percent of their deposits, instead of holding any excess reserves.<sup>14</sup>

<sup>14</sup> Alternatively, one can treat the horizontal axis in the diagram as representing real rather than nominal bank deposits, where changes in the IOER rate lead to changes in the deposit multiplier and therefore to proportional changes in both nominal bank deposits and the price level.

VII. c. *Excess Reserves and Bank Lending in Japan*

Some authorities doubt that IOER accounts for U.S. banks' exceptional demand for excess reserves, and the associated decline in bank lending, because the same phenomena have occurred in other countries, and most notably in Japan, and did so even when banks' reserve balances in those places bore no interest. As Kazuo Ogawa (2005, p. 1) observes, "Japanese banks have chronically held excess reserves since the late 90's," with excess reserves tending, as in the U.S. since October 2008, to rise *pari passu* with the Bank of Japan's additions to the total reserve stock.

However, Kazuo also observes that Japan is no exception to the rule that "reserve supply does not necessarily automatically create a demand for reserves," and that Japan's banks, no less than U.S. banks, "have their own motives for excess reserves." The motives have, moreover, been more-or-less the same in both cases.

U.S. banks, as we've seen, accumulated excess reserves because the positive return on those reserves was greater than the still-positive return on wholesale as well as some retail loans. Japanese banks, in contrast, began hoarding reserves long before the Bank of Japan began paying interest on reserves a month after the Fed's having done so, in November 2008.

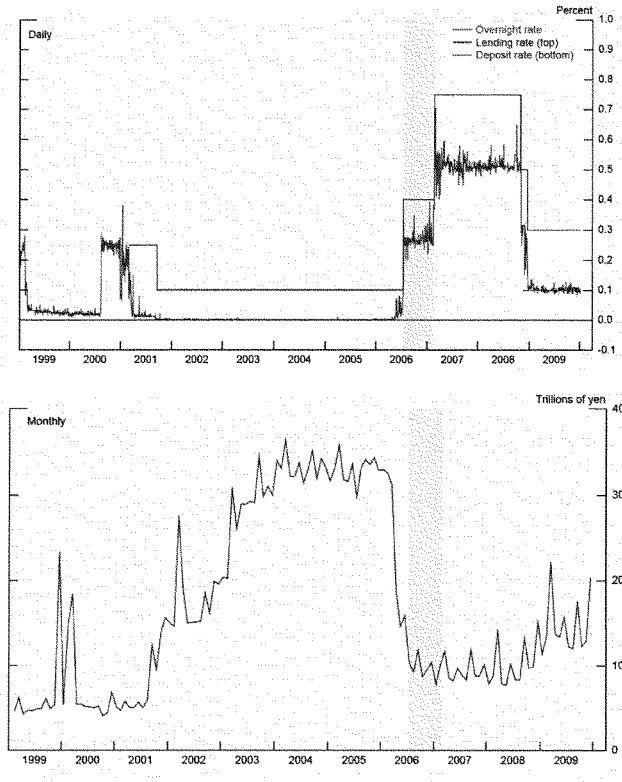
But as the U.S. case itself demonstrates, what matters isn't the *absolute* IOER rate, but how that compares to rates on alternative uses of bank funds. In Japan before November 2008, although the IOER rate was zero, the overnight uncollateralized call rate—Japan's equivalent to the fed funds rate—had itself fallen to zero, making reserves and call loans very close substitutes despite the fact that reserves bore no interest. The fact that Japanese depositors became increasingly leery of bank failures in the 90s finally tipped the scale in favor of reserves, as Japanese banks gained a further incentive to bolster their precautionary balances.

As can be seen in the pair of charts below, reproduced from Bowman, Gagnon, and Leahy (2010, p. 32), so long as the Bank of Japan paid no interest on banks' reserve balances, Japanese banks accumulated excess reserves only after March 2001, when the Bank of Japan, in initiating its Quantitative Easing Program, allowed the call rate itself to fall to zero. When the BOJ ended that program five years later, while also increasing its

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Martin, McAndrews, and Skeie (2011) develop a more formal model from which they draw conclusions similar to those arrived at by less formal means here. In particular, they find that "the key determinant of bank lending is the difference between the return on [bank] loans and the opportunity cost of making a loan," and that "banks lend up to the point where the marginal return on loans equals the return on holding reserves." They also show that, once this point has been reached, further additions to the supply of bank reserves have no effect on bank lending, and, in the presence of balance-sheet size related costs, such as capital requirements and FDIC assessments, may even reduce it. This last point has obvious implications for the likely effectiveness of the Fed's Large-Scale Asset purchase. Andolfatto (2015), using a different model, reaches quite similar conclusions.

lending rate, the call rate again rose above zero, causing Japan's banks to reduce their excess reserve balances. Finally, in November 2008, by beginning another round of Quantitative Easing, and reducing its lending rate to 30 basis points, the Bank of Japan brought the call rate back down 10 basis points, while simultaneously beginning to pay banks 10 basis points on their reserve balances. Consequently, Japanese banks once again began accumulating excess reserves.<sup>15</sup>

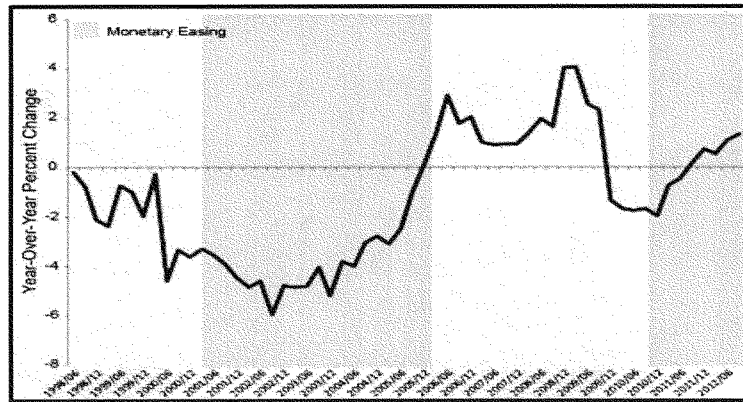


<sup>15</sup> For the purpose of paying interest on banks' reserve balances, the Bank of Japan established its Complementary Deposit Facility. Although that facility was originally supposed to expire on March 16, 2009, it has since been made permanent. Interestingly, since banks can only maintain excess reserves at the facility, the BOJ paid interest on excess reserves only, and not on banks' required reserves. Japan's IOER rate remained positive until January 2016, when the Bank of Japan introduced a "three tier" arrangement for Japanese banks' account balances with it, in which one tier pays a positive, one a zero, and one a negative interest rate.



In short, like the Fed after October 2008, the Bank of Japan saw to it, intentionally or not, that Japanese banks' excess reserve balances rose and fell in lockstep with changes in the size of its balance sheet, which they would not have done had it maintained a positive spread between the call rate and the rate it paid on excess reserves. According to Ogawa's estimates, had Japan's call rate been 25 basis points rather than zero after 2000, even with no improvement in Japanese banks' perceived financial health, banks' subsequent demand for excess reserves might have been reduced by as much as 70 percent!

Thanks to the Bank of Japan's strategy, and in agreement with our own understanding that the influence of IOER on bank lending will be greatest where bank net interest margins are lowest, Japan's Quantitative Easing programs, instead of resulting in more lending by Japanese banks, had just the opposite effect, as seen in the next chart:



While it doesn't contradict the claim that IOER can be a crucial determinant of banks' willingness to accumulate excess reserves, Japan's experience does cast doubt on the suggestion that a U.S. IOER rate of zero would have sufficed after 2008 to have kept banks there from hoarding excess reserves. Whether it would have depends on whether other U.S. short-term rates, and the effective fed funds rate in particular, would have remained above zero. If not, nothing short of a *negative* IOER rate would have served to preserve a positive opportunity cost of reserve holding. Even so, a zero IOER rate would have supplied less of an inducement for reserve hoarding than a positive one. More importantly, as we shall see, Fed officials themselves were convinced that, had they returned the U.S. IOER rate to zero, the effective fed funds rate, despite falling further, would nevertheless have remained positive.

#### VII. d. IOER, Liquidity, and Bank Lending

Besides directly reducing bank lending by encouraging banks—and large U.S. banks and U.S. branches of foreign banks especially—to prefer, at the margin, acquiring excess reserves to making bank loans, IOER has also reduced it indirectly, by depriving those (mainly smaller) banks that have not been so inclined to accumulate excess reserves of their traditional means of covering themselves against the risk of short-run reserve shortages that additional lending entails. As the late Ronald McKinnon observed in a 2011 *Wall Street Journal* Op-Ed,

Banks with good retail lending opportunities typically lend by opening credit lines to nonbank customers. But these credit lines are open-ended in the sense that the commercial borrower can choose when—and by how much—he will actually draw on his credit line. This creates uncertainty for the bank in not knowing what its future cash positions will be. An illiquid bank could be in trouble if its customers simultaneously decided to draw down their credit lines.

Ordinarily, McKinnon continued, banks can cover their unexpected reserve shortfalls by borrowing funds from other banks on the interbank market. However, if “large banks with surplus reserves become loath to part with them for a derisory yield,” while smaller ones “cannot easily bid for funds at an interest rate significantly above the prevailing interbank rate without inadvertently signaling that they might be in trouble,” interbank borrowing ceases to be an attractive alternative to maintaining higher excess reserve cushions, even where the marginal return on reserves is less than that on loans.

The situation McKinnon describes is, of course, precisely the one that has prevailed ever since October 2008.

#### *VII. e. Other Constraints on Bank Lending*

To insist that IOER contributed to the post-Lehman decline in bank lending, and especially to the decline in lending as a share of total bank deposits, isn't to deny that other developments also played a part in that decline. Most obviously, a decline in overall loan *demand* was part of the story. But to suggest that it was such a decline *rather than* IOER that mattered, as many in the banking industry seem inclined to do, is to erect a false dichotomy: if banks reduced their loans while increasing their reserves, they did so, not simply because lending became less lucrative, but because it became so *relative to the alternative of reserve hoarding*. Had it not been for IOER, banks would have been far less inclined to prefer reserves to low-yielding loans. IOER and reduced loan demand thus worked together, like the blades of a scissor, to discourage banks from lending.

A shortage of bank *capital* might, on the other hand, have prevented banks from increasing their loans despite the presence of both abundance of excess reserves and favorable lending opportunities. As Huberto Ennis and Alexander Wolman (2011) explain,

As a readily available source of funding, high levels of reserves provide flexibility to a bank that is looking to expand its loan portfolio. However, loans (and risky securities) are associated with higher capital requirements than reserves. A bank that is holding reserves but is facing a binding capital constraint is thus unlikely to engage in a sudden expansion of lending. As with deposits, raising capital quickly can be costly. For this reason, even a bank that holds a high level of excess reserves may not be able to take advantage of new lending (or investment) opportunities (p. 276).

However, in their own study of this possibility, Ennis and Wolman find that, while many banks were indeed capital constrained during the Fed's "first wave of reserve increases," by the last quarter of 2009, bank capital had recovered to the point where, of \$510 billion in reserves held by the biggest 100 banks, \$485 billion were loanable. By the end of 2011, finally, almost all of the reserves held by the same banks were loanable given existing capital requirements. In separate study also looking at larger banks and BHCs, Jose Berrospide and Rochelle Edge (2010) likewise found that changes in BHCs' capital ratios had only modest effects on loan growth. Instead of worrying about capital, banks and BHCs seemed more concerned about things like loan demand and risk. (Alas, Berrospide and Edge did not consider the possible influence of IOER.)

Nor does capital seem to have significantly constrained lending at the opposite end of the banking spectrum, where banks must usually rely on retained earnings to build capital. According to Jim Wilkinson and Jon Christensson (2011, pp. 43 and 46), who investigate lending by community banks in the Tenth Federal Reserve District between the start of 2001 and the end of 2009, programs established during the crisis for the purpose of placing funds into those banks' capital accounts did so little to boost that lending that it would have been "more effective for policymakers to give money directly to small businesses in the form of grants or loans."

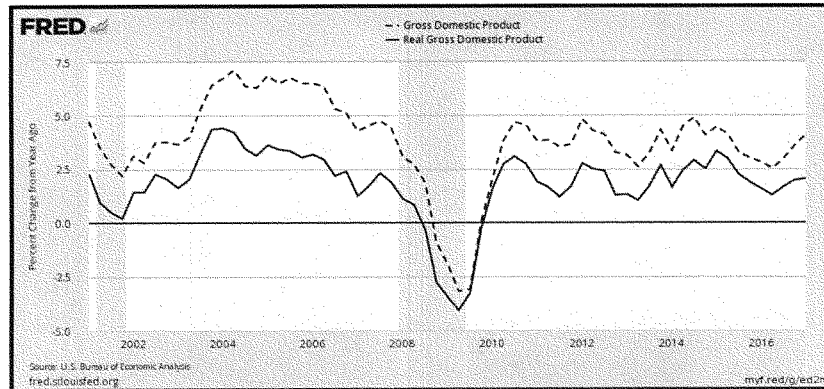
## VIII. IOER and Monetary Policy

### *VIII. a. IOER and Tight Money in 2008–9*

Having considered the bearing of IOER on various sorts of bank lending, we're now equipped to consider how it influenced the course of the subprime recession and subsequent recovery. In brief, besides undermining economic productivity by diverting scarce savings from more to less productive uses, IOER contributed to both the recession itself and the slow pace of the subsequent recovery by serving as the instrument by which the Fed—whether wittingly or not—kept money too tight.

Although there were clear signs of trouble in the subprime mortgage market starting in early 2007, the recession to which those troubles eventually led didn't officially begin until December 2007. As is true by definition of any officially-designated recession, that one was heralded by a substantial decline in various measures of overall real economic activity, and particularly in the growth rate of real GDP, that had been going on for several months.

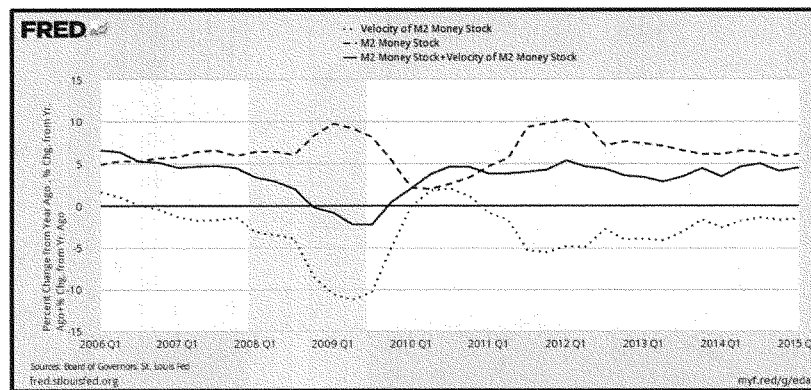
As is typically, though not necessarily, the case, the recession also involved a similar, but even sharper, decline in *nominal* GDP, or total spending on goods and services. From a peak growth rate of over 7 percent during the boom, nominal GDP growth declined gradually to about 4.75 percent in the third quarter of 2007. It then fell precipitously, reaching a low just shy of *minus* 3.2 percent by the second quarter of 2009. And although the growth rate of spending recovered considerably over the next year, since mid-2010 it has never again reached 5 percent, and has often been less than 3 percent. In short, spending has never made up the ground it lost during the recession's first year.



While the connection between reduced spending and recession isn't inevitable, it's a strong one, for reasons that aren't difficult to grasp. For in order not to be accompanied by some decline in real GDP, a decline in nominal GDP would have to be matched by a proportional decline in prices, as measured by the GDP deflator. To the extent that it isn't, because prices are "rigid" or "sticky" or for any other reason, real GDP must also decline. In practice, a sharp and persistent decline in overall spending is bound to bring a recession.

The volume of spending itself depends on the quantity of money, however one chooses to measure it, and its velocity, which can be understood as an inverse measure of the public's demand for money balances, expressed as a share of their total earnings. As the next chart shows, although the velocity of M2 was growing at the beginning of 2006,

by 2007 it was declining. That decline became increasingly rapid, and especially so after Lehman Brothers failed. By mid-2009, M2 velocity was more than 11 percent lower than it had been a year before. Although the quantity of M2 tended to increase as its velocity declined, the increase fell persistently and increasingly short of what was needed to maintain a steady growth rate of spending, let alone what it would have taken to restore spending to its original trend path. Instead, that growth rate fell steadily until, during the last quarter of 2008, it became negative.



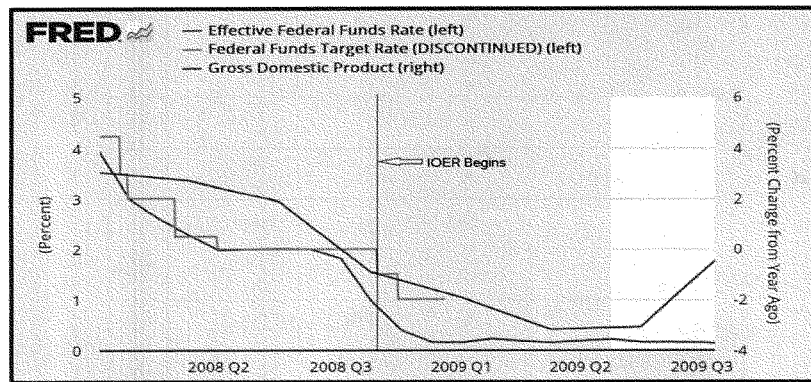
In light of these statistics, it's clear in retrospect that monetary policy had been too tight throughout 2007 and early 2008, and that this overtightening became especially pronounced during the last quarter of 2008 and the first quarters of 2009. Taking a 5 percent spending growth rate to represent the long-run trend, it's equally clear that money remained too tight over the next several years to restore that spending growth rate, let alone make up for the fallen *level* of spending relative to where it would have been had the growth rate of spending never fallen below 5 percent.

The especially severe overtightening that followed Lehman's failure reflected the FOMC's desire to maintain the 2 percent fed funds rate target then still in effect. That target was, according to the committee's reckoning, consistent with meeting the Fed's inflation target, whereas anything lower risked surpassing that target. Finding that its subsequent emergency lending was undermining that chosen target, the Fed responded, as we've seen, by implementing IOER as a means for preventing any further "leakage" of its emergency credits into the fed funds market. IOER thus became the chief instrument by which the Fed aggravated, however inadvertently, the collapse in nominal spending that had already been in progress, making the recession that much more severe. Commenting on the Fed's action not long afterward, blogger David Beckworth (2008) went so far as to compare the Fed's mistake to the one it made in 1936–1937.

Not long ago another blogger, Scott Sumner (2017), having the advantage of hindsight, reached a verdict that was hardly less damning. “The decision to adopt IOR,” he writes (meaning, presumably, what we’ve labelled IOER), “helped to *prevent* the Fed from achieving its policy goals, by making the Great Recession more severe than otherwise.” He continues,

The world would be a better place today if the Fed had never instituted its policy of IOR in 2008. I really don’t see how anyone can seriously dispute this claim. If you want to dispute the claim, what specific way did IOR make the world a better place? When the policy was adopted in 2008, the New York Fed explained it to the public as a contractionary policy. Can anyone seriously argue that the world would be worse off if monetary policy had been *less contractionary* in 2008–12? Why?

Fed officials were in fact aware of the economy’s deteriorating state as they prepared to begin paying banks to hold reserves; that deterioration is what convinced them to finally reduce the federal funds rate target from 2 percent to 1.5 percent. Yet the Fed still went ahead, the very next day, with its IOER plan. The Fed chose, in other words, to ease monetary policy *symbolically*, while taking steps to prevent the reserves it was creating from actually contributing to a further lowering of the effective funds rate. The FOMC’s next and final rate cut under what still appeared to be, but was in fact no longer, its traditional monetary control regime, from 1.5 percent to 1 percent, was likewise largely symbolic, for by then the fed funds market, considered as a market for interbank lending, had more-or-less ceased to function.



Thus far, at least, the Fed’s experiment was proceeding according to plan. For despite the economy’s ongoing decline, that plan called not for loosening monetary policy but for *avoiding* further loosening, along with the stimulus such loosening might provide, by preventing growth in the Fed’s balance sheet from encouraging additional bank

lending. By December 2008, however, the Fed concluded that the economy needed to be stimulated after all. The trouble was that achieving a stimulus in the Fed's new IOER-based regime was only barely possible in theory, and lamentably difficult in practice.

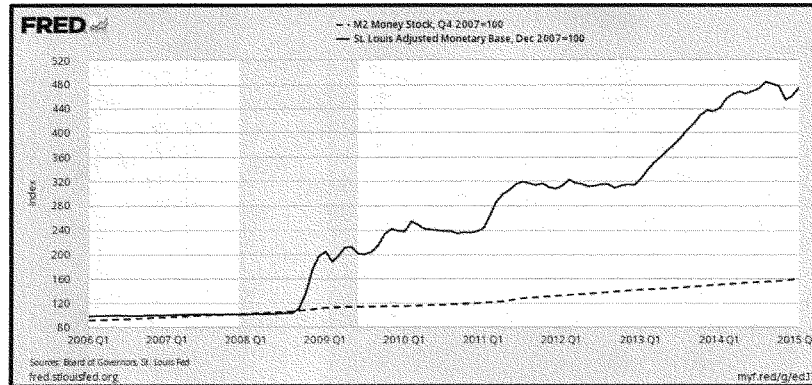
*VIII. b. IOER and "Quantitative Easing"*

The problem of course was that, so long as the IOER rate remained high relative to other short-term rates, including the going fed funds rate, the Fed's asset purchases, no matter how large, would tend to lead to almost equal growth in banks' excess reserve holdings, and therefore to very little growth in either bank deposits or monetary aggregates. That is, IOER would have the same effect during the Fed's rounds of QE as it had beforehand, when the Fed's balance sheet was expanding, not as part of a deliberate monetary stimulus program, but as the incidental consequence of its emergency lending. If it's indeed true that "insanity is doing the same thing over and over again, but expecting different results," then in expecting extra bank reserves to stimulate the economy after 2009, using the same operating framework they relied upon to *prevent* extra reserves from stimulating the economy following Lehman's collapse, Fed officials were not playing with a full deck.

Small wonder then that, despite an almost 4.5-fold increase in the monetary base between December 2008 and December 2014, bank deposits grew only about 60 percent.<sup>16</sup> Although this outcome took many commentators by surprise—including more than a few who feared that the Fed's asset purchases would lead to high, if not hyper, inflation—it did so only because they hadn't grasped the implications of the Fed's IOER policy, and the new operating framework it established.

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<sup>16</sup> The Fed's three rounds of Large Scale Asset Purchases have informally come to be known since as QE1, QE2, and QE3. QE1, which ran from December 2008 to June 2010, added \$2.1 trillion, mainly in Mortgage-Backed Securities (MBS), to the Fed's balance sheet. For QE2, which ran from November 2010 until June 2011, the Fed bought \$600-billion worth of Treasury securities. QE3, finally, began in September 2012, and consisted of an open-ended program of securities purchases, starting with \$40 billion in MBS per month, and supplemented, beginning in December 2012, with monthly purchases of another \$45 billion in long-term Treasury securities. In all, between December 2008 and October 2014 the Fed purchased securities worth not quite \$4 trillion, or about 4.5 times its total assets just prior to the crisis.



Fed officials, on the other hand, understood what they were up against. Indeed, they even disliked the expression “Quantitative Easing” because it suggested, misleadingly, that the Fed regarded LSAPs as a means for expanding the quantity of money, and for giving a boost thereby to spending, prices, and employment. Instead, the Fed hoped that its asset purchases might influence the real economy through other channels. In particular, they appealed to the existence of a “portfolio balance” channel, in which changes in nominal quantities, and in bank lending especially, played no essential part. Instead, the Fed’s asset purchases were supposed to boost real economic activity by altering relative asset prices. In particular, swapping bank reserves for long-term securities was expected to promote investment by lowering long-term interest rates.

But whether there really is such a thing as a portfolio balance channel is a matter of considerable controversy. Just before he left the Fed Bernanke, when asked how confident he was in QE’s effectiveness, famously replied that “The problem with QE is it works in practice, but it doesn’t work in theory (quoted in Harding 2014).” Though said in jest, there was more than a little truth in Bernanke’s remark—or in the last part of it at any rate. And Bernanke knew it. As a 2014 *Financial Times* article explains, according to theory that prevailed in the years before the crisis,<sup>17</sup> so long as banks themselves are indifferent between holding new excess reserves and trading them for other assets, as they would be at the zero lower bound in the absence of IOER, and as they are if reserves bear interest at or above the going market rate, the Fed’s own asset purchases

should have no effects. All that happens is the central bank swaps one kind of government debt—money—for another kind of government debt, in the form of a

<sup>17</sup>In particular, Eggertson and Woodward (2003).



long-term Treasury bond. That can only make any difference if investors have a strong preference for one kind of debt over the other (Harding 2014).

For the portfolio-balance channel to be relevant, it had to be the case, as Bernanke himself explained in his 2012 Jackson Hole speech, that “different classes of financial assets are *not* perfect substitutes in investors’ portfolios” (Bernanke 2012; my emphasis).

Concerning this theory, Stephen Williamson (2017) of the St. Louis Fed supplies what I believe to be the best, albeit very brief, assessment:

Basically, the idea is to think about QE for what it is—financial intermediation by the central bank. If QE is to work, and for the better, the reason has to be that the central bank can do a better job of turning long-maturity assets into short-maturity assets than either the private sector, or the fiscal authority.

So regarded, the theoretical merits of QE—or rather, of LSAPs—doesn’t seem especially compelling.

But did QE at least work in practice, as Bernanke claimed it did? In the aforementioned Jackson Hole speech, Bernanke went on to refer to statistical evidence that the Fed’s strategy had succeeded. But many other economists find this same evidence far from convincing. Williamson, for example, considers it “pretty sketchy”:

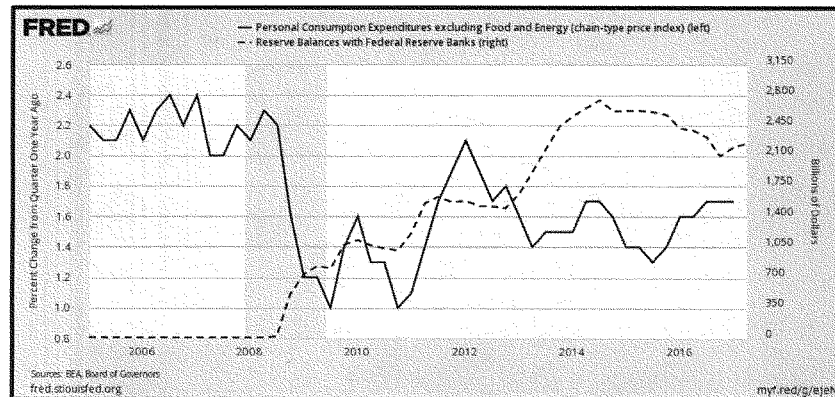
For the most part, the empirical work consists of event studies—isolate an announcement window for a policy change, then look for movements in asset prices in response. There’s also some regression evidence, but essentially nothing (as far as I know) in terms of structural econometric work, i.e. work that is explicit about the theory in a way that allows us to quantify the effects (ibid.).

The positive findings, furthermore, generally concern QE’s effects on bond yields only, rather than on more important macroeconomic variables, such as inflation and unemployment. As Mirco Balatti and his coauthors (2016, p. 3) quite properly observe, to conclude that QE was “effective” merely because it altered bond yields is to toy with the usual meaning of monetary policy effectiveness, by conflating a policy’s success in influencing an intermediate policy target with its success in achieving ultimate policy goals. According to those authors’ own assessment, while QE did indeed lower interest rates, and boost equity prices, it otherwise “struggled to propel the macroeconomy” (ibid., p. 5). Nor is their finding all that surprising. After all, not long before, former vice-chair Donald Kohn had reached a similar conclusion. “I think it’s fair to say,” Kohn remarked, that “although [LSAPs] were effective to some extent, people—even the Fed—were somewhat disappointed. It’s been a slow recovery from a very deep recession” (quoted in Harding 2014).<sup>18</sup>

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<sup>18</sup> For thorough evaluation of QE, see Thornton (2015).

The Fed's post-crisis inability to achieve its desired inflation target offers striking proof of the inadequacy of its new operating system, and especially so since January 2012, when, for the sake of keeping the public's inflation expectations "firmly anchored," the Fed announced an explicit inflation target, consisting of a 2 percent annual increase in the Personal Consumption Expenditure (PCE) index (Board of Governors 2012). In making that announcement, the Board of Governors declared that "the inflation rate over the longer run is primarily determined by monetary policy" (ibid.). That was certainly true under the Fed's traditional operating system, as is evident in the pre-crisis behavior of the PCE index, as shown in the chart below. During that time, for better or worse, the Fed had no difficulty maintaining a PCE inflation rate just a little in excess of 2%, which was then, according to many, the Fed's implicit inflation target.<sup>19</sup> In contrast, since it announced its explicit PCE target, with its new stuck-in-neutral operating system in place, the Fed has failed to reach that target in every quarter save that of the announcement itself—and has done so despite adding over one *trillion* dollars to banks' reserve balances!



As the *New York Times* reported recently, although "the direct cost of mildly undershooting the Fed's inflation target is low,"

What is worrisome is not the direct damage, but the fact that the Fed has missed its (arbitrary) 2 percent target in the same direction—undershooting—year after year... That in turn implies that the low-growth, low-inflation, low-interest rate economy since 2008 isn't going anywhere. This would prove especially damaging

<sup>19</sup> "For better or worse" because maintaining a steady inflation target at a time of rapid productivity growth meant tolerating unusually rapid NGDP growth, which may have contributed to the subprime bubble. See Borio and Lowe (2002).

if the economy ran into some negative shock; a lack of Fed credibility could leave it less able to prevent a recession (Irwin 2017).

#### *VIII. c. Stimulus without IOER?*

The most important question concerning the Fed's approach to post-crisis stimulus is, not whether it was at all successful, but whether another approach might have been better. In particular, what would have happened had the Fed dispensed with IOER while still expanding its balance sheet?

It happens that Fed officials themselves considered this very question as the Fed was deciding, earlier in the summer of 2010, whether to renew the QE1 asset purchases it had tentatively ended that June. As Ben Bernanke (2010b) reported in his Jackson Hole speech that August, having contemplated "reducing the IOER rate to, say, ten basis points or even to zero" as one of several alternatives to having the Fed buy more assets, he and his colleagues concluded that

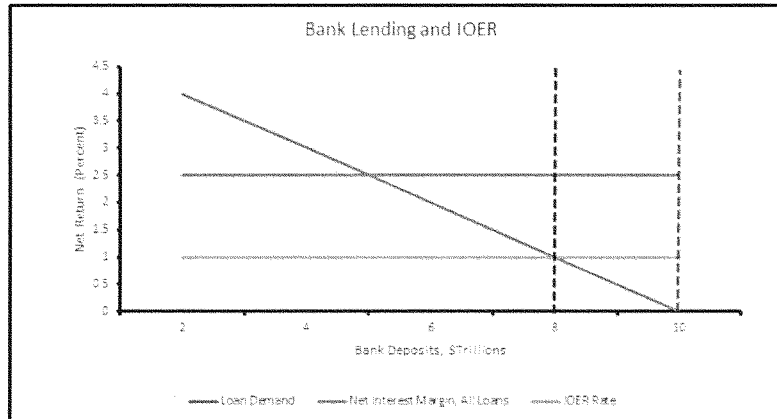
On the margin, a reduction in the IOER rate would provide banks with an incentive to increase their lending to nonfinancial borrowers or to participants in short-term money markets, reducing short-term interest rates further and possibly leading to some expansion in money and credit aggregates. However, under current circumstances, the effect of reducing the IOER rate on financial conditions in isolation would likely be relatively small. The federal funds rate is currently averaging between 15 and 20 basis points and would almost certainly remain positive after the reduction in the IOER rate. Cutting the IOER rate even to zero would be unlikely therefore to reduce the federal funds rate by more than 10 to 15 basis points. The effect on longer-term rates would probably be even less, although that effect would depend in part on the signal that market participants took from the action about the likely future course of policy.

These conclusions are striking for at least two reasons. They imply, first of all, that Bernanke and his colleagues no longer believed, if they ever did, that IOER alone stood in the way of having the fed funds rate decline to zero. No less significantly, by emphasizing the likely interest-rate effects of eliminating IOER rather than the likely "expansion in money and credit aggregates" to which that change would lead, they suggest that those officials regarded a low- or no-IOER alternative as if it were just another way to take advantage of a "portfolio-balance channel," instead of a means for putting the Fed's traditional transmission mechanism back in gear. By thinking this way they could hardly avoid dramatically underestimating the alternative policy's potential benefits.<sup>20</sup>

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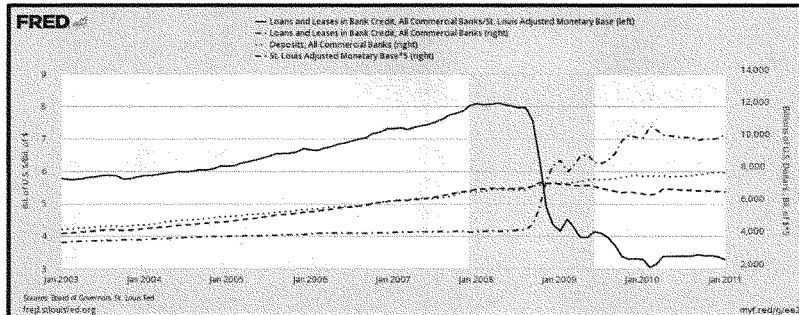
<sup>20</sup> At least one Federal Reserve Board economist, Joseph Gagnon (2010) thought that the IOER rate should be lowered nonetheless. In a July 2010 blog post he wrote that "the Fed should lower the interest rate it pays on bank reserves to zero. This is a small step, as the current rate is only 0.25 percent, but there is no reason to pay banks more than the rate paid by the closest substitute, short-term Treasury bills."

To see why, consider again our diagrammatic representation of the influence of IOER on bank lending:



The Fed's assessment mainly takes account of the movement along a given, downward-sloping loan demand schedule associated with a decline in the IOER rate. But recall that that movement represents an equilibrium only assuming that the Fed *withdraws* reserves from the banking system to an extent equal to the decline in the quantity of reserves demanded following the rate reduction. Otherwise the banks will dispose of those same unwanted reserves by exchanging them for other, interest-yielding assets, and will continue doing so until deposits have grown to the point at which the quantity of reserves demanded is again equal to the quantity supplied. The reserve-deposit multiplier will, in other words, spring back to life. Its revival means that the overall volume of bank lending, instead of merely increasing to the extent implied by a movement down a fixed loan demand schedule, increases much further by virtue of a general increase in nominal magnitudes, which entails a corresponding rightward-shift in the loan demand schedule.

To get some idea of how much even a partial revival of the money multiplier would have mattered, consider that, over the decades prior to Lehman's failure, every dollar of base money supported between 5 and 8 times as many dollars of bank lending, the higher figure having been reached just before the crash. In contrast, by June 2010, mainly thanks to IOER, the ratio had fallen to 3.38. Consequently, even assuming, very conservatively, a post-Lehman base-money-to-loans multiplier of 5, the elimination of interest payments on reserves in the summer of 2010 would, other things equal, have raised the equilibrium value of bank lending by more than \$3.2 trillion.



Besides underestimating the extent to which ending IOER might boost bank lending, Bernanke (2010b) and his colleagues worried that it

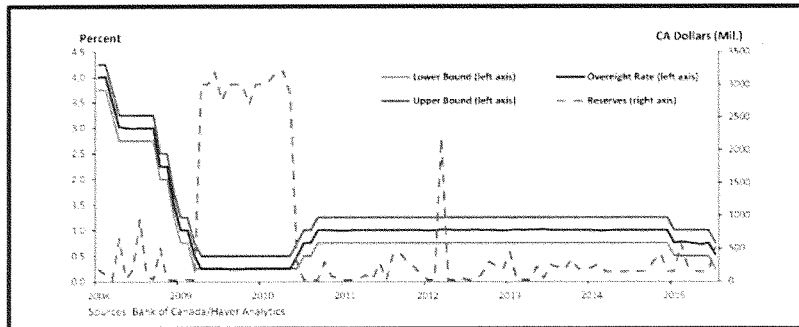
could lead short-term money markets such as the federal funds market to become much less liquid, as near-zero returns might induce many participants and market-makers to exit. In normal times the Fed relies heavily on a well-functioning federal funds market to implement monetary policy, so we would want to be careful not to do permanent damage to that market.

Here the Fed's reasoning was not only incorrect, but disingenuous. If anything prevented the fed funds market from functioning as it had "in normal times," above-market IOER was it! Although it's true that reducing the IOER rate to zero would have eliminated the arbitrage opportunity that was responsible for most of the fed funds lending that occurred while IOER was still in effect, as banks disposed of excess reserves they no longer wished to hold, bringing their holdings back to minimal levels, "normal" interbank lending would resume. In other words, what Fed officials were weighing as potential "damage" to the fed funds market was but a stage in the restoration of that market's robust health.

#### *VIII. e. Canada's Counterexample*

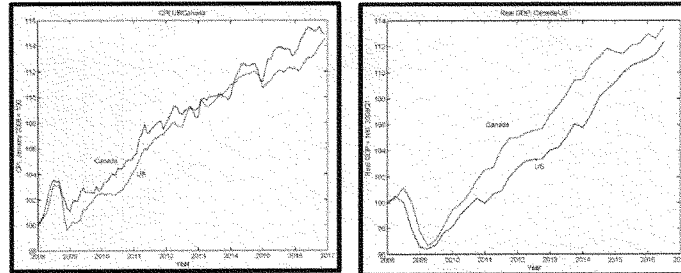
At the time of the crisis the Bank of Canada operated a symmetrical corridor system, in which the Bank of Canada's lending rate ("Bank rate") served as the channel's upper bound, while the "deposit rate" it paid on banks' overnight balances—the counterpart of the Fed's IOER rate—served as its lower bound. Until April 21, 2009, these upper and lower bounds were respectively set at 25 basis points above, and 25 points below, the Bank's chosen overnight lending rate target. The Bank's IOER rate was therefore a below-market rate, by design as well as in fact. As Canadian banks weren't subject to any minimum reserve requirements, this arrangement encouraged them to keep their overnight reserves at a bare minimum, typically equal to about C \$25 million.

Between April 21, 2009 and June 1, 2010, in response to Canada's worsening recession, the Bank of Canada switched briefly to a floor system, by setting both its target and its deposit rate at 25 basis points, and thereby making banks indifferent between holding overnight balances and lending them. At the same time, it provided banks with an additional C \$3 billion in excess reserves, which they duly kept at the Bank's standing deposit facility.



Had Fed officials been right in thinking that continued reserve creation, coupled with above-market IOER, was a more reliable means for stimulating economic activity than dispensing with banks' extraordinary demand for reserves would have been, the Bank of Canada's chosen response to the crisis, with its meager and temporary boost to banks' excess reserve holdings, must surely have been far less effective than the massive and sustained increase in U.S. banks' excess reserve holdings overseen by the Fed. Yet, as the figures below, reproduced from Stephen Williamson's blog, show, if anything the opposite was true: Canadian real GDP and the Canadian price level both recovered somewhat *more* rapidly than their U.S. counterparts from their spring 2009 nadirs. "As an econometrician once told me," Williamson (2017) wryly observes in commenting on them,

if I can't see it, it's probably not there. Sure, since Canada is small and is highly integrated with the US economically, Fed policy will matter for Canadian economic performance. But, if QE were so important, the fact that the US did it and Canada did not should make some observable difference for relative performance.

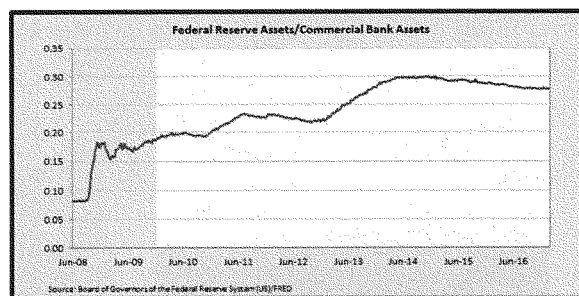


## IX. IOER and Credit Allocation

### IX. a. Central banking versus Commercial Banking

As we've seen, although the total quantity of Fed reserve balances is mainly a function of the size of the Fed's balance sheet, the quantity of *excess* reserves banks hold ultimately depends on banks' *demand* for such reserves, as influenced by their yield relative to other assets.

By using IOER to encourage banks to hold more excess reserves, the Fed has dramatically altered its own role in the intermediation of scarce savings. Thanks to IOER, bank reserves, which until the recent crisis made up only a fraction of a percent of total bank deposits, are now equal to a fifth of those deposits. Bank lending to businesses, farmers and consumers has, on the other hand, gone from roughly matching total bank deposits to being equal to only four-fifths of those deposits. The Fed has thus made itself responsible, not merely for regulating the nominal scale of deposit-based financial intermediation in the U.S. economy, but for actually disposing of a substantial share of the public's savings. As the chart below shows, relative to the assets held by the entire U.S. commercial banking system, the Fed's holdings are now four times what they were before the crisis.



Were the Fed itself just another commercial bank, or a particularly well-managed commercial bank, it might be expected to employ the public's savings at least as efficiently as commercial banks themselves might, by directing them to uses offering relatively high risk-adjusted returns.<sup>21</sup> But the Fed is not a commercial but a central bank. As such it was never intended to act as an efficient financial intermediary, whether by directly competing with commercial banks or by having them serve as mere agents to it,<sup>22</sup> as they do to the extent that they keep substantial excess reserve balances instead of other interest-earning assets. Unlike commercial banks a central bank's purpose is to secure macroeconomic stability and to otherwise attend to the interests of the public at large, rather than to those of its nominal owners.

The Fed's unique responsibilities have as their counterpart unique operating principles that differ greatly from those appropriate to commercial banks, including guidelines concerning both the sort of assets it should invest in, and the extent of its overall involvement in credit allocation. A relatively recent statement of these guidelines can be found in a 2002 Federal Reserve System Study Group report on "Alternative Instruments for System Operations." Among other things the report states that as a public entity the Fed should "manage its portfolio to be adequately compensated for risks" while also maintaining "sufficient liquidity in its portfolio to conduct potentially large actions on short notice."

Until 1966 these principles were met by limiting the Fed's open-market purchases to "Treasuries only," meaning short-term Treasury securities. However, in that year Congress amended the Federal Reserve Act to temporarily allow the Fed to purchase any fully-guaranteed agency securities, and in 1968 that change was made permanent (Haltom and Sharp 2014).

The Fed was also supposed to "structure its portfolio and undertake its activities so as to minimize their effect on relative asset values and credit allocation within the private sector (Board of Governors 2002)." This last rule, the same report continues,

is consistent with well-supported doctrines in the economics literature: In general, market price mechanisms allocate resources most effectively when undistorted by government actions, and market-directed resource allocation fosters long-run economic growth. The truth of these doctrines also has been borne out by much hard experience, both domestic and international, with varying levels of governmental intervention in the market process (p. 1-2).

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<sup>21</sup> Ideally, this would mean high *risk-adjusted* returns. That implicit and explicit guarantees encourage at least some actual commercial banks to engage in excessively risky lending is of course an all-too-notorious fact.



According to the FOMC's original 1968 guidelines concerning them, even the Fed's agency security purchases were "not designed to support individual sectors of the market or to channel funds into issues of particular agencies."<sup>23</sup>

#### *IX. b. IOER and Financial Repression*

Because the Fed's own portfolio choices are limited, and especially because it doesn't extend credit to nonfinancial firms or individuals, it can't be expected to employ savings as efficiently or productively as commercial banks can. For that reason it is only reasonable that it should be expected to intrude as little as possible on "market-directed resource allocation" and, specifically, that it should avoid having banks hold unnecessarily large balances with it. Indeed, those central banks that do otherwise are generally condemned for engaging in what economists call "financial repression," meaning practices that "prevent the financial intermediaries of an economy from functioning at their full capacity," thereby interfering with the efficient allocation of credit and impairing economic growth (Ito 2009).<sup>24</sup>

Yet, as we've seen, by paying IOER at above-market rates while generating trillions of dollars in additional reserve balances, the Fed has curtailed "market-directed resource allocation" by a corresponding amount. Instead of being market-directed, the resources represented by commercial banks' excess reserve balances have instead been directed by the Fed towards those entities whose securities it purchased during several rounds of Quantitative Easing.

Some may wonder whether paying banks to accumulate excess reserves really has the same, oppressive effects as imposing high reserve requirements might. If holding reserves pays more than other uses of funds, then isn't it also efficient for banks to hold reserves instead of acquiring other assets? The answer is that it would be efficient only if the Fed's relatively high IOER rates reflected its own capacity to employ funds more productively than private-market lenders. But the Fed's ability to pay above-market IOER rates is due, not to its being an unusually efficient intermediary, but to the seigniorage it

<sup>23</sup>According to Renee Haltom and Robert Sharp (2014, pp. 6–7), during the December 2008 FOMC meeting held after QE1 had been announced, then Richmond Fed President Jeffrey Lacker observed that that plan appeared inconsistent with the guidelines in question, and particularly with the Fed's press release stating that the purchases were intended "to reduce the cost and increase the availability of credit for the purchases of houses, which in turn should support housing markets and foster improved conditions in financial markets more generally." In January 2009, when the FOMC voted to suspend the guidelines indefinitely, Lacker alone dissented (Appelbaum 2013).

<sup>24</sup>According to Ito (2009, p. 430), common examples of financially repressive policies include "interest rate ceilings, liquidity ratio requirements, high bank reserve requirements, capital controls, restrictions on market entry into the financial sector, credit ceilings or restrictions on directions of credit allocation, and government ownership or domination of banks."

While high minimum reserve requirements and the use of relatively high IOER rates to induce banks to accumulate excess reserves both alter the direction of credit allocation, high reserve requirements also tend to enhance governments' seigniorage revenues, while high IOER rates may not serve that purpose.

earns on its non-interest-bearing notes and on non-interest-bearing balances kept with it, which it can use to cross-subsidize bank reserves. Furthermore, because the Fed doesn't practice mark-to-market accounting, it doesn't have to provide for unrealized portfolio losses. Consequently, it is able to finance relatively high IOER rates in part by assuming greater risks, including the substantial duration risk it took on by acquiring long-term Treasury and mortgage-backed securities.

Finally, to gain a more complete appreciation of the similar real consequences of above-market IOER and high mandatory reserve requirements, suppose, first, that instead of paying banks to hoard reserves the Fed achieved a similarly high reserve ratio by imposing a continuously-enforced 20-percent reserve requirement against all commercial bank deposits. Taken alone that step would lead to a severe contraction in nominal bank lending and bank deposits and, ultimately, to a corresponding decline in the price level. In the resulting equilibrium, the Fed's *real* asset holdings would have grown, in both absolute terms and relative to commercial bank assets, to roughly the same extent as has happened in fact, though in a manner that would leave no doubt concerning the "repression" involved, consisting of a reallocation of savings from commercial banks to the Fed, and from commercial bank lending to bolstering the markets for Fed-favored securities.

Next suppose that, instead of tolerating deflation, the Fed accompanied its new 20 percent reserve requirement with a plan to expand its balance sheet just enough to allow banks to meet the new requirement without having to shrink their own balance sheets. Although the new plan would avoid major changes in nominal magnitudes apart from a substantial increase in nominal bank reserves, it would, according to standard quantity-theory reasoning, result in the same long-run *real* outcomes. That is, it would lead to a new steady-state that was just as financially repressive as the one to which the deflationary alternative led.

The Fed's actual IOER policy is essentially the same as this last alternative, the sole difference being its use of subsidized IOER payments instead of high mandatory reserve requirements to dramatically boost banks' demand for reserves.

#### *IX. c. IOER and the Productivity Slowdown*

One of the most disconcerting features of the post-crisis recovery has been the "great productivity slowdown" that has accompanied it (Kravis 2017). Since the start of the recession in late 2007, labor productivity has grown at an average annual rate of just 1.1 percent—far below the 2.3 percent average growth rate between 1947 and 2007. Many reasons have been offered for the slowdown, including a deficient supply of bank credit. As one recent IMF study put it, "the combination of pre-existing firm-level financial fragilities and tightening credit conditions made an important contribution to the post-crisis productivity slowdown" (Duval, Hong, and Timmer 2017). Such findings are not all that surprising in light of the understanding that many central banks, and the Fed

especially, have embraced novel monetary policy frameworks that are highly financially repressive, and also in light of the vast theoretical and empirical literature linking such financially-repressive policies to economic underdevelopment.<sup>25</sup> As Robert Barro (2016) has observed regarding the U.S. case, “The dramatic rise in high-powered money was good for the Fed’s profits (most of which went to the U.S. Treasury). However, none of this was likely to contribute to productivity growth.”

#### *IX. d. Digression on Narrow Banking*

While I’ve portrayed above-market IOER, and the very high bank reserve ratios it has led to, as financially repressive, some proponents of “narrow banking” (e.g., Kay 2009, pp. 51ff) might well regard them favorably, as a step toward their ideal. According to that ideal, instead of using deposits, and insured retail deposits especially, to fund *any* bank lending, banks ought to back such deposits entirely with “genuinely safe liquid assets” (ibid., p. 58), consisting mainly, if not solely, of government securities. To the extent that a deposit-taking bank took part in retail lending, it would have to fund such lending with its own capital or by borrowing on wholesale markets. In more aggressive narrow banking proposals, narrow banks would be altogether prohibited from engaging in retail lending, which would instead become the exclusively prerogative of separate, non-deposit-taking firms (Bossone 2002, p. 8).

Although this isn’t the place for anything like a thorough-going assessment of narrow banking proposals, some remarks concerning the apparent inconsistency of such proposals with lesson drawn from writings pointing to the financially repressive effects of policies favoring high bank reserve ratios appears to be in order.

How to account for these radically different perspectives? The basic answer is that, while students of financial repression take for granted the existence of a synergistic relation between deposit taking on one hand and lending on the other, proponents of narrow banking instead view the marriage of these two activities as an undesirable and unnecessary consequence of government deposit guarantees. As John Kay (2009, p. 53) puts it, “In a free market, narrow banking would have emerged spontaneously and immediately... The outcome of market forces has been suppressed, and the natural outcome of market forces—narrow banking—should be imposed by regulation.”

Having written extensively on the history of banking, and especially on episodes of more-or-less unregulated banking, I can say with considerable confidence, and with all due respect to Mr. Kay and like-minded proponents of narrow banking, that there isn’t a shred of truth in his assertion. While government deposit guarantees, whether explicit or implicit, are a relatively recent innovation, the marriage of deposit taking and lending is as old as banking itself. Institutions resembling narrow banks have, in contrast, taken

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<sup>25</sup> See, in particular, Roubini and Sala-i-Martin (1992), De Gregorio and Guidotti (1995), and Levine (1997).

shape in the past only with the help of government interventions aimed at suppressing “broader” rivals.<sup>26</sup>

What’s more, deposit-taking and loan-making have long been married for very good reasons, so that forcing them to separate would in fact be quite costly, just as the financial repression literature suggests. As Biagio Bossone (2002) explains in his excellent critical assessment of narrow banking proposals,

the benefits of banking cannot be fully appreciated if either the asset or the liability side of the bank balance sheet is considered in isolation. A synergistic benefit results when banks use their stable deposit base to finance time-consuming production technologies that yield goods and services (p. 14).

Retail lending and deposit taking are therefore more efficiently supplied jointly than as the separate products of separate institutions. This is especially obvious when bank loans take the form of “lines of credit” granted to borrowers—that is, of deposit balances they may draw upon at any time, with interest assessed only on withdrawn sums.<sup>27</sup> Narrow banking, by ending this efficient joint production, would increase the cost and reduce the extent of private sector lending (*ibid.*, pp. 15–16.)

## X. IOER and Monetary Policy Normalization

### X. a. *The Fed’s Plan*

Ever since the Fed began its large-scale asset purchases, Fed officials have been promising that, once recovery from the crisis was complete, they would begin a process of monetary policy “normalization.” In particular, they promised to eventually reduce the size of the Fed’s balance sheet, though they only announced a specific plan for doing so relatively recently. According to that plan, and as seen in the figure below, the Fed plans to shed \$1.5 trillion assets between now and 2022, bringing its balance sheet to \$3 trillion, or to about 15 percent of projected 2022 GDP (Board of Governors 2017a).

But while “normalization” has always been understood to involve restoring the Fed’s balance sheet to something closer to its pre-crisis size, in another, more important respect, the Fed’s understanding of the term has changed over time. Whereas at first the Fed was also inclined to get around at last to establishing a “corridor” system of monetary control, it now appears inclined to keep its post-crisis “leaky floor” system in place. Somewhere along the way, in other words, the Fed quietly deemed its current monetary control mechanism the “new normal.”

<sup>26</sup> See, *inter alia*, Selgin and White (1987), Selgin (2011), and Selgin (2012).

<sup>27</sup> The practice of granting lines of credit itself dates back to the early 18<sup>th</sup> century, when the Royal Bank of Scotland introduced what became known in Scotland as the “cash credit” system.

Thus in February 2010, when he first testified before Congress on what was then still referred to as the Fed's "exit strategy," Ben Bernanke told Congress that the Fed "anticipates that it will eventually return to an operating framework with much lower reserve balances than at present and with the federal funds rate as the operating target for policy" (Bernanke 2010a). In a footnote to his written testimony, Bernanke (ibid.) made it clear that he had a corridor system in mind:

The authority to pay interest on reserves is likely to be an important component of the future operating framework for monetary policy. For example, one approach is for the Federal Reserve to bracket its target for the federal funds rate with the discount rate above and the interest rate on excess reserves below. Under this so-called corridor system, the ability of banks to borrow at the discount rate would tend to limit upward spikes in the federal funds rate, and the ability of banks to earn interest at the excess reserves rate would tend to contain downward movements (n9).

Although Bernanke adds, in the same note, that "other approaches are also possible," and that the Fed "has ample time to consider the best long-run framework for policy implementation," the Fed was evidently inclined to return to an arrangement differing only modestly from its pre-crisis system. Apart from being reasonably consistent with a literal understanding of "normalization," that plan would have realized, as a floor system could not, Bernanke's hope that the Fed would eventually settle on an operating framework that would not "impose costs and distortions on the banking system."

That Fed officials have since become keen on sticking with a floor-type monetary control arrangement, based on an above-market IOER rate, is evident both from their plan to establish a long-run balance sheet roughly three times as large, relative to GDP, as its pre-crisis counterpart, and also from several of Janet Yellen's June 2017 remarks to the press. Although Yellen (2017a) claimed then that the Fed still had plenty of time left to decide on its eventual operating framework, she went on to "point out" that

our current system is working well and has some important advantages. In particular, it's simple and efficient to operate, does not require active management of the supply of reserves, and, most importantly, provides good control over the federal funds rate and effective transmission of changes in the federal funds rate to broader money market rates. And because our current system is likely compatible with the much smaller quantity of reserves, our plan for gradually reducing our balance sheet does not constrain the Committee's future options for how to implement monetary policy (pp. 5-6).

Yellen observed, furthermore, that "changing the target *range* for the federal funds rate" would remain the Fed's "primary means of adjusting the stance of monetary policy" and that the Fed did not intend to treat the Fed's balance sheet as "an active tool for monetary policy in *normal* times" (my emphasis). Taking that last remark to rule out, not just Quantitative Easing, but also ordinary open-market operations, as means for influencing

the fed funds rate, Yellen's statement implies that the Fed now intends to stick to the present system.

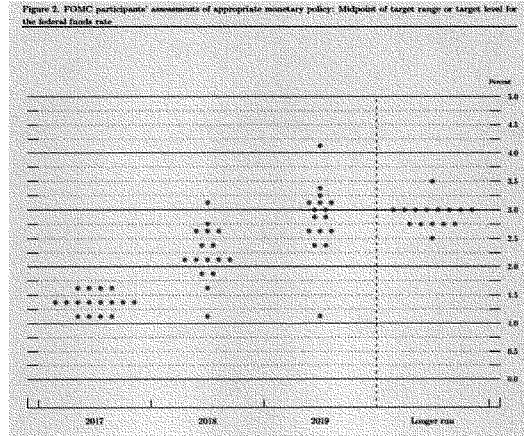
And why shouldn't it? First, because, despite what Yellen says, the current arrangement has never worked well. True, it has succeeded in keeping the effective fed funds rate within the Fed's "target range." But in a system in which fed funds activity is almost all devoted to arbitraging the difference between the upper and lower limits of that range, such success is nugatory. The Fed's new framework has also succeeded in the sense that changes in the IOER rate have led to like changes in other short term rates. But as has been noted, these achievements refer to the Fed's intermediate policy objectives only, rather than to its ultimate policy goals. Assessed in light of those ultimate goals, and particularly in light of the Fed's ongoing failure to achieve its stated inflation target, the Fed's new operating framework can only be judged a failure.

Second, and just as importantly, so long as the current operating framework remains in effect, the Fed may not be able to shrink its balance sheet to any great extent without falling even further short of its announced inflation target.

#### *X. b. A Recipe for Failure*

The Fed's plan for balance-sheet reduction is unlikely to succeed because it calls for both a gradual reduction in the nominal quantity of bank reserves and the maintenance, if not the strengthening, of banks' extraordinary *appetite* for such reserves.

Regarding the last point, most Fed officials take for granted a long-run "normal" fed funds rate level of about 3 percent, reflecting an assumed normal real rate—"r-star," in Fedpeak—of one percent, plus the Fed's 2 percent inflation target. Having the effective fed funds rate approach 3 percent is therefore also part of their normalization strategy. To judge by FOMC members' most recent projections, as shown in the chart below, that goal, or something close, will be reached within the next several years, which is to say, while the Fed is also in the process of shrinking its balance sheet.



Under the present, floor-type regime, however, raising the effective fed funds rate *means* raising the IOER rate. “During normalization,” the Board’s plan states, “the Federal Reserve intends to move the federal funds rate into the target range set by the FOMC primarily by adjusting the interest rate it pays on excess reserve balances.” Allowing for the “leakiness” of the IOER rate floor, the IOER will actually have to be raised to a level somewhat above 3 percent, and perhaps not far from twice its present setting. The trouble is that, even allowing that the Fed’s long-run estimate of *r*-star is correct, and that *either* raising IOER to above 3 percent *or* shrinking the Fed’s balance sheet according to a predetermined schedule would not result in monetary overtightening, combining the two is very likely to have just that consequence.<sup>28</sup>

<sup>28</sup> In fact there is considerable disagreement, even within the Fed, concerning the likelihood that *r*-star (the equilibrium real federal funds rate) will return to one percent within the next several years. For example, in their recent San Francisco Fed study Jens Christensen and Glenn Rudebusch (2017b) use Treasury Inflation-Protected Securities (TIPS) prices to arrive at what they consider to be especially reliable *r*-star estimates and projections. They conclude that as of December 2016 *r*-star stood close to zero, and that it “is more likely than not to remain near its current low for the foreseeable future” (ibid., p. 27). Elsewhere the same authors (Christensen and Rudebusch 2017a) observe that “For policymakers and researchers, the equilibrium interest rate provides a neutral benchmark to calibrate the stance of monetary policy: Monetary policy is expansionary if the short-term real interest rate lies below the equilibrium rate and contractionary if it lies above. Therefore, determining a good estimate of the equilibrium real rate has been at the center of recent policy debates.”

On increasing IOER rates as a means of monetary tightening, see Bowman, Gagnon, and Leahy (2010). Among other things these authors note, citing the Norges Bank’s experience, that according to theory, “the scale of balances outstanding need not damp the effectiveness of tightening using the interest rate on reserves as a policy tool.”

A rudimentary but still informative way of understanding this last conclusion involves an exercise in textbook macroeconomics and, more specifically, an appeal to the quantity theory of money and the related idea of monetary neutrality. According to the quantity theory, holding the real demand for various goods and assets constant, a one-time change in the nominal quantity of money should lead to a proportional change in prices and related nominal variables, but no change in the real equilibrium quantity of any good or asset. According to this understanding, holding banks' real demand for excess reserves unchanged, a halving of the size of the Fed's balance sheet, and in the nominal stock of bank reserves, should eventually result in a halving of the price level, which will leave banks with the same real quantity of excess reserves they started with. The banking system reserve ratio and base-money multiplier should also be unchanged.<sup>29</sup>

As the Fed has already been struggling to achieve its inflation target, the most likely consequence of its choosing to proceed with its balance sheet reduction plan will be a still more serious shortfall of the inflation rate from its target. Yellen's July (2017b) testimony makes it clear that such an outcome could cause the Fed to reconsider its plan. The FOMC, she said, was

prepared to resume reinvestments if a material deterioration in the economic outlook were to warrant a sizable reduction in the federal funds rate. More generally, the committee would be prepared to use its full range of tools, including altering the size and composition of its balance sheet, if future economic conditions were to warrant a more accommodative monetary policy than can be achieved solely by reducing the federal funds rate.

Because it may well take a "sizeable" reduction in the IOER rate (and accompanying reduction in the fed funds rate target) to keep the Fed's planned net asset sales from causing disinflation, Yellen's statement amounts to a warning that, should the economic situation deteriorate, the Fed's balance-sheet reduction plan might come to a screeching halt.

#### *X. c. A Plea for Genuine Normalization*

For all the reasons just described, the Fed's present "normalization" plan is unlikely to result in any substantial change from the status quo. First and most worrisomely, it will leave the current floor-type monetary control framework in place. Second, because it is likely to result in disinflation, the plan could well be abandoned

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<sup>29</sup> David Andolfatto informs me that, for IOER at least equal to the rate of return on Treasury securities, the quantity-theory result holds in his own particular formal representation (Andolfatto 2015) of monetary policy since 2008, under the condition that banks do not consider excess reserves and the securities that the Fed plans to dispose of to be perfect substitutes. Since excess reserves are uniquely free of duration risk, the latter assumption almost certainly holds in practice.



before the Fed has shrunk substantially. Indeed, if the Fed sticks to its planned IOER rate increases, it could end up buying assets yet again to combat that disinflation.

Yet a genuine normalization of monetary policy, including both a substantial reduction of the Fed's balance sheet and the substitution of a "corridor" system for the present leaky floor arrangement, is possible; and it needn't involve any unwanted disinflation. To achieve it, the Fed must do two things. First and most crucially, it must plan, not to raise, but to *lower* the IOER rate, relative to market rates if not absolutely, enough to eventually make holding excess reserves less attractive to banks than disposing of them through either wholesale or retail lending. Second, the Fed must reduce the size of its balance sheet, and thereby reduce the outstanding supply of reserve balances, enough to offset the decline in banks' demand for excess reserve balances that will take place as the difference between the IOER rate and other short-term rates declines, and especially as it becomes negative.

As the IOER rate moves from being an above-market "leaky floor" rate to becoming a below-market "corridor" rate, the volumes of both ordinary bank lending and bank lending *and borrowing* on the fed funds market will increase. Eventually, instead of being a mere conduit for bank-nonbank interest rate arbitrage, the fed funds market will resume again its role as a "first resort" source of borrowed bank liquidity; and the fed funds rate will once again become sensitive to modest changes to the available quantity of bank reserves. The Fed can then return to its pre-crisis practice of setting a single-valued fed funds rate target, to be reached by means of open-market security purchases and sales. The only difference between the new arrangement and the Fed's actual, pre-crisis system will be that in the new one, the IOER rate will serve as an above-zero fed funds rate lower bound, as well as a means for compensating banks for holding required reserves and clearing balances. IOER will, in other words, serve only the purposes it was meant to serve when the 2006 Financial Services Regulatory Relief Act was passed, instead of serving purposes far removed from what those responsible for that legislation had intended.

Though genuine normalization of monetary policy is achievable, that doesn't mean it will be easy. On the contrary: the transition back to normal will pose difficult challenges. During it, for example, the effective fed funds rate will cease for a time to be a reliable indicator of the stance of monetary policy. The possibility is one Ben Bernanke (2010a) addressed when he outlined the Fed's original "exit" strategy back in February 2010. To allow for it, he said, the Fed might temporarily switch to

communicating the stance of policy in terms of another operating target, such as an alternative short-term interest rate. In particular, it is possible that the Federal Reserve could for a time use the interest rate paid on reserves, in combination with targets for reserve quantities, as a guide to its policy stance, while simultaneously monitoring a range of market rates (p. 10).

Nor will it be an easy matter for the Fed to coordinate its net asset sales with reductions in its IOER rate so as to avoid either inflation or deflation. “If the amount of sales ordered by the FOMC was too small,” Larry Wall (2017) observes, “the resulting excessive stimulation would likely result in higher inflation. If the amount of sales was too large, the resulting excessive tightness could cause the economy to go into a recession.” Wall is, of course, entirely correct. However, the problem he describes is to some degree common to any plan that calls for adjustments to the size of the Fed’s balance sheet, including the current one. One difference is that, unlike the plan proposed here, the Fed’s present plan does not even acknowledge the need to coordinate its planned balance sheet changes with offsetting IOER rate settings!

Another difference, however, does make the plan proposed here especially challenging. Unlike the Fed’s plan, it involves a regime switch, consisting of a move from a floor system to a corridor system, which will occur as the IOER rate ceases to be an above-market rate and instead becomes a slightly below-market one. The change might well involve a revival of wholesale bank lending too sudden to be offset by Fed asset sales without upsetting the markets for those assets. Fortunately, the Fed has a ready-made solution to this problem, in the shape of the Term Deposit Facility it established in early 2017 “to facilitate the conduct of monetary policy by providing a tool that may be used to manage the aggregate quantity of reserve balances held by depository institutions” (Central Bank Central 2017). The term deposit auctions undertaken by that facility serve, like Fed asset sales, to drain reserves from the banking system for the term of the auctioned deposits, but do so without disrupting asset markets. The Fed can therefore use such auctions to maintain monetary control as it passes from a floor to a corridor regime, without having to depart from a gradual balance-sheet reduction schedule.

In any case, the Fed shouldn’t be allowed to treat the difficulty of switching from the present monetary policy framework to a corridor system as an excuse for perpetuating the former. As I’ve tried to show in some detail, the existing monetary control framework is both extremely unreliable and extremely inefficient. It also involves substantial departures from long-established principles of central banking and from the intent of the 2006 law granting the Fed the right to pay interest on bank reserves. In short, whether the Fed wishes to abandon the current system or not, Congress should compel it to do so, and to thereby conform again to the spirit, as well as to the letter, of the statutes that govern it.

## References

- Afonso, Gara, Alex Entz, and Eric LeSueur. 2013. "Who's Lending in the Fed Funds Market?" Federal Reserve Bank of New York *Liberty Street Economics*, December 2.
- Afonso, Gara, Anna Kovner, and Antoinette Schoar. 2010. "Stressed, Not Frozen: The Fed Funds Market in the Financial Crisis." National Bureau of Economic Research Working Paper No. 15806, March: 2–56.
- Andolfatto, David. 2015. "A Model of U.S. Monetary Policy Before and After the Great Recession." Federal Reserve Bank of St. Louis *Review* 97 (3), pp. 233–56.
- Appelbaum, Binyamin. 2013. "A Bold Dissenter at the Fed, Hoping His Doubts Are Wrong." *The New York Times*, January 8.
- Balatti, Mirco, Chris Brooks, Michael T. Clements, and Konstantina Kappou. 2016. "Did Quantitative Easing Only Inflate Stock prices? Macroeconomic Evidence from the US and UK." Unpublished ms, September.
- Ball, Laurence, Joseph Gagnon, Patrick Honohan, and Signe Krogstrup. 2016. "What Else Can Central Banks Do?" Geneva Reports on the World Economy No. 18.
- Bank of Canada. 2010. "Bank of Canada Increases Overnight Rate Target to ½ Per Cent and Re-establishes Normal Functioning of the Overnight Market." Press release, June 1.
- Barro, Robert J. 2016. "The Job-Filled Non-Recovery." Unpublished ms, Harvard University, September.
- Bech, Morten L, Carl T. Bergstrom, Martin Rosvall, and Rodney J. Garratt. 2015. "Mapping Changes in the Overnight Money Market." *Physica A* 424: 44–51.
- Beckworth, David. 2008. "Repeating the Fed's Policy Mistake of 1936–1937." *Macro Musings* (Blog), October 29.
- Bernanke, Ben. 2010a. "Federal Reserve's Exit Strategy." Testimony before the Committee on Financial Services, U.S. House of Representatives, February 10.
- . 2010b. "The Economic Outlook and Monetary Policy." Speech at the Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, Wyoming, August 27.
- . 2012. "Monetary Policy since the Onset of the Crisis." Speech at the Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, Wyoming, August 31.
- . 2015. *The Courage to Act*. New York: W.W. Norton.
- Bernanke, Ben, and Donald Kohn. 2016. "The Fed's Interest Payments to Banks." Ben Bernanke's Blog, Brookings, February 16.
- Berrospide, Jose and Rochelle Edge. 2010. "The Effects of Bank Capital on Lending: What Do We Know, and What Does It Mean?" Federal Reserve Board of Governors Finance and Economics Discussion Series Paper No. 44: 1–48.
- Bewley, Truman. 1980. "The Optimum Quantity of Money." In John Kareken and Neil Wallace, eds., *Models of Monetary Economics*. Minneapolis, Minnesota: Federal Reserve Bank of Minneapolis.
- Blinder, Alan. 2012. "How Bernanke Can Get Banks Lending Again." *Wall Street Journal*, July 22.

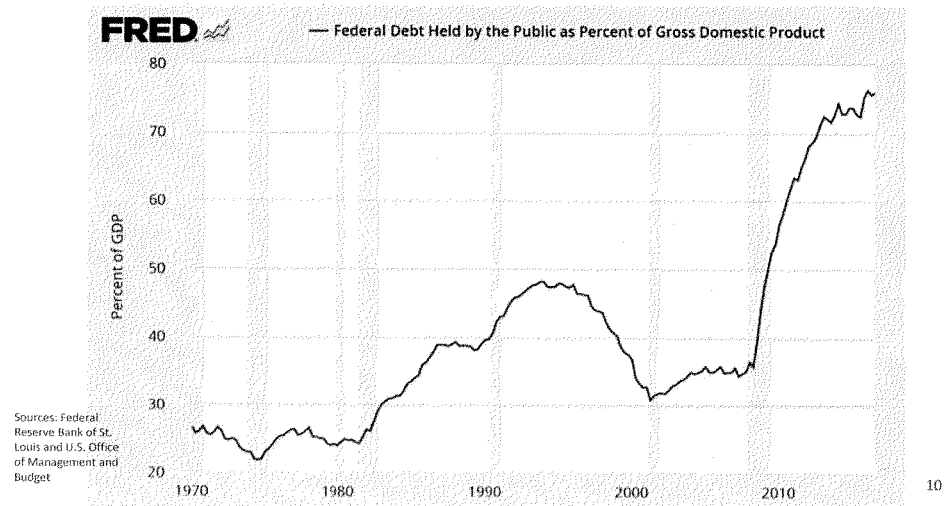
- Board of Governors of the Federal Reserve System. 2002. "Alternative Instruments for Open Market and Discount Window Operations." Federal Reserve System Study Group on Alternative Instruments for System Operations. December.
- \_\_\_\_\_. 2008. "Press Release: Implementation of Interest on Excess Reserves." October 6.
- \_\_\_\_\_. 2012. "Federal Reserve Issues FOMC Statement of Longer-Run Goals and Policy Strategy." Press Release, January 25.
- \_\_\_\_\_. 2017a. "Policy Normalization."  
<https://www.federalreserve.gov/monetarypolicy/policy-normalization.htm>
- \_\_\_\_\_. 2017b. "Policy Tools: The Discount Rate."  
<https://www.federalreserve.gov/monetarypolicy/discountrate.htm>
- Borio, Claudio and Piti Disyatat. 2009. "Unconventional Monetary Policies: An Appraisal." BIS Working Paper No. 292.
- Borio, Claudio and Philip Lowe. 2002. "Asset Prices, Financial and Monetary Stability: Exploring the Nexus." BIS Working Paper No. 114.
- Bossone, Biagio. 2002. "Should Banks be 'Narrowed': An Evaluation of a Plan to Reduce Financial Instability." Levy Institute *Economics Brief* No. 69.
- Bowman, David, Fang Cai, Sally Davies, and Steven Kamin. 2011. "Quantitative Easing and Bank Lending: Evidence from Japan." Federal Reserve Board of Governors International Finance Discussion Paper No. 1018.
- Bowman, David, Etienne Gagnon, and Mike Leahy. 2010. "Interest on Excess Reserves as a Monetary Policy Instrument: The Experience of Foreign Central Banks." Federal Reserve Board of Governors International Finance Discussion Paper No. 996: 1–47.
- Central Bank Central. 2017. "Term Deposit Facility Overview."
- Christensen, Jens H.E., and Glenn D. Rudebusch. 2017a. "New Evidence for a Lower New Normal in Interest Rates." Federal Reserve Bank of San Francisco *Economic Letter* 2017-17, June 19.
- \_\_\_\_\_. 2017b. "A New Normal for Interest Rates? Evidence from Inflation-Indexed Debt." Federal Reserve Bank of San Francisco Working Paper 2017-07, May.
- Craig, Ben, Sara Millington, and John Zito. 2014. "Who is Holding All the Excess Reserves?" Federal Reserve Bank of Cleveland *Economic Trends* Report.
- De Gregorio, Jose, and Pablo E. Guidotti. 1995. "Financial Development and Economic Growth." *World Development* 23 (3), March: 433–48.
- Dutkowsky, D. H., and David D. VanHoose. 2017. "Interest on Reserves, Regime Shifts, and Bank Behavior." *Journal of Economics and Business*, 91, 1–15.
- Duval, Romain, Gee Hee Hong, and Yannick Timmer. 2017. "Financial Frictions and the Great Productivity Slowdown." IMF Working Paper WP/17/21, May.
- Eggertson, Gauti and Michael Woodford. 2003. "The Zero Bound on Interest Rates and Optimal Monetary Policy." Brookings Papers on Economic Activity No. 1: 139–233.
- Ennis, Huberto and Alexander Wolman. 2011. "Large Excess Reserves in the United States: A View from the Cross-Section of Banks." *International Journal of Central Banking* 11 (1): 251–289.
- Eubanks, Walter. 2002. "Proposals to Allow Federal Reserve Banks to Pay Interest on

- Reserve Balances: The Issues behind the Legislation." *Congressional Research Service Report-RL30874*: 1–14.
- Gagnon, Joseph E. 2010. "Time for a Monetary Boost." *The Blog*, HuffPost, July 21.
- \_\_\_\_\_. 2016. "Quantitative Easing: An Underappreciated Success." Peterson Institute for International Economics Policy Brief 16-4.
- Goodfriend, Marvin. 2002. "Interest on Reserves and Monetary Policy." Federal Reserve Bank of New York *Economic Policy Review* 8 (1): 77–84.
- Goodfriend, Marvin and Monica Hargraves. 1983. "A Historical Assessment of the Rationales and Functions of Reserve Requirements." Federal Reserve Bank of Richmond *Economic Review* No. 69: 3–21.
- Graham, Frank. 1930. *Exchange, Prices, and Production in Hyperinflation: Germany 1920–1923*. Princeton: Princeton University Press.
- Haltom, Renee, and Robert Sharp. 2014. "The First Time the Fed Bought GSE Debt." Federal Reserve Bank of Richmond *Economic Brief*, April.
- Hamilton, James. 2017. "How the Federal Reserve Controls Interest Rates." *Econbrowser* (Blog), March.
- Hamilton, James and Cynthia Wu. 2012. "The Effectiveness of Alternative Monetary Policy Tools in a Zero Lower Bound Environment," *Journal of Money, Credit, and Banking*, Vol. 44, No. 1: 3–45.
- Harding, Robin. 2014. "US Quantitative Measures Worked in Defiance of Theory." *Financial Times*, October 13.
- Higgins, Byron. 1977. "Interest Payments on Demand Deposits: Historical Evolution and the Current Controversy." Federal Reserve Bank of Kansas City *Economic Review* July-August: 1–11.
- Ireland, Peter. 2012. "The Macroeconomic Effects of Interest on Reserves." National Bureau of Economic Research Working Paper No. 18409, September: 1–49.
- Irwin, Neil. 2017. "Janet Yellen and the Case of the Missing Inflation." *New York Times*, June 14.
- Ito, Hiro. 2009. "Financial Repression." *The Princeton Encyclopedia of the World Economy*, v. 1. Princeton: Princeton University Press, pp. 430–33.
- Kahn, George A. 2010. "Monetary Policy under a Corridor Operating Framework." Federal Reserve Bank of Kansas City *Economic Review*, Fourth Quarter: 5–34.
- Kay, John. 2009. "Narrow Banking: The Reform of Banking Regulation." Unpublished ms, September 15.
- Keister, Todd. 2012. "Corridors and Floors in Monetary Policy." Federal Reserve Bank of New York *Liberty Street Economics*, April 4.
- Keister, Todd and Gaetano Antinolfi. 2012. "Interest on Excess Reserves and Cash 'Parked' at the Fed." Federal Reserve Bank of New York *Liberty Street Economics*.
- Keister, Todd, Antoine Martin, and James McAndrews. 2012. "Divorcing Money from Monetary Policy." Federal Reserve Bank of New York *Economic Policy Review*, September: 41–56.
- Kohn, Donald. 2005. "Regulatory Relief," Testimony before the Subcommittee on Financial Institutions and Consumer Credit, Committee on Financial Services, U.S. House of Representatives, June 9.

- \_\_\_\_\_. 2009. "Policy Challenges for the Federal Reserve." Speech at the Kellogg School of Management, Northwestern University, Evanston, Illinois, November 16.
- Kravis, Marie-Josée. 2017. "The Great Productivity Slowdown." *Wall Street Journal*, May 4.
- Laurent, Robert, and Larry Mote. N.d. "Some Neglected Problems in Paying Interest on Reserves." Unpublished ms, Federal Reserve Bank of Chicago.
- Levine, Ross. 1997. "Financial Development and Economic Growth: Views and Agenda." *Journal of Economic Literature* 35 (2), June: 688–726.
- Martin, Antoine, James McAndrews, and David Skeie. 2011. "Bank Lending in Times of Large Bank Reserves," Federal Reserve Bank of New York Staff Report No. 497: 1–29.
- McKinnon, Ronald. 2011. "The Return of Stagflation." *Wall Street Journal*, May 24.
- Meyer, Laurence. 2000. "Payment of Interest on Reserves and Fed Surplus." Testimony Before the Committee on Banking and Financial Services, U.S. House of Representatives, May 3.
- Noizet, Julien. 2016. "Misunderstanding the Net Interest Margin." *Alt-M*, June 1.
- Ogawa, Kazuo. 2005. "Why Commercial Banks Held Excess Reserves: The Japanese Experience of the Late '90s." Unpublished ms, Institute of Social and Economic Research, Osaka University, December.
- Potter, Simon. 2015. "Money Markets and Monetary Policy Normalization." Speech at the Money Marketeters of New York University.
- Regulation D: Reserve Requirements for Depository Institutions. 2015. "Rules and Regulations." *Federal Register* 80, No. 119, June 22: 35567.
- Roubini, Nouriel, and Xavier Sala-i-Martin. 1992. "Financial Repression and Economic Growth." *Journal of Development Economics* 39: 5–30.
- Rudebusch, Glenn D. 2011. "The Fed's Interest Rate Risk." Federal Reserve Bank of San Francisco *Economic Letter*, April 11.
- Sargent, Thomas, and Neil Wallace. 1985. "Interest on Reserves." *Journal of Monetary Economics* 13: 259–90.
- Selgin, George. 2011. "The State and 100 Percent Reserve Banking." *Alt-M*, May 31.
- \_\_\_\_\_. 2012. "Those Dishonest Goldsmiths." *Financial History Review* 19 (3), December: 269–88.
- \_\_\_\_\_. 2016. "New York's Bank: The National Monetary Commission and the Founding of the Fed." Cato Institute *Policy Analysis* No. 793, June 2016.
- \_\_\_\_\_. 2017a. "A Monetary Policy Primer, Part 9: Monetary Control, Now." *Alt-M*, January 10.
- \_\_\_\_\_. 2017b. "How Our 'Big Fat Fed' Put on Trillions and Why It Needs to Lose Them Now." CNBC, April 3.
- Selgin, George, and Lawrence H. White. 1987. "The Evolution of a Free Banking System." *Economic Inquiry* 25 (3), July: 439–57.
- Sumner, Scott. 2017. "Time to Abolish Interest on Reserves." *Money Illusion* (Blog), March 14.
- Thornton, Daniel. 2015. "Requiem for QE." Cato Institute *Policy Analysis* No. 783, November.

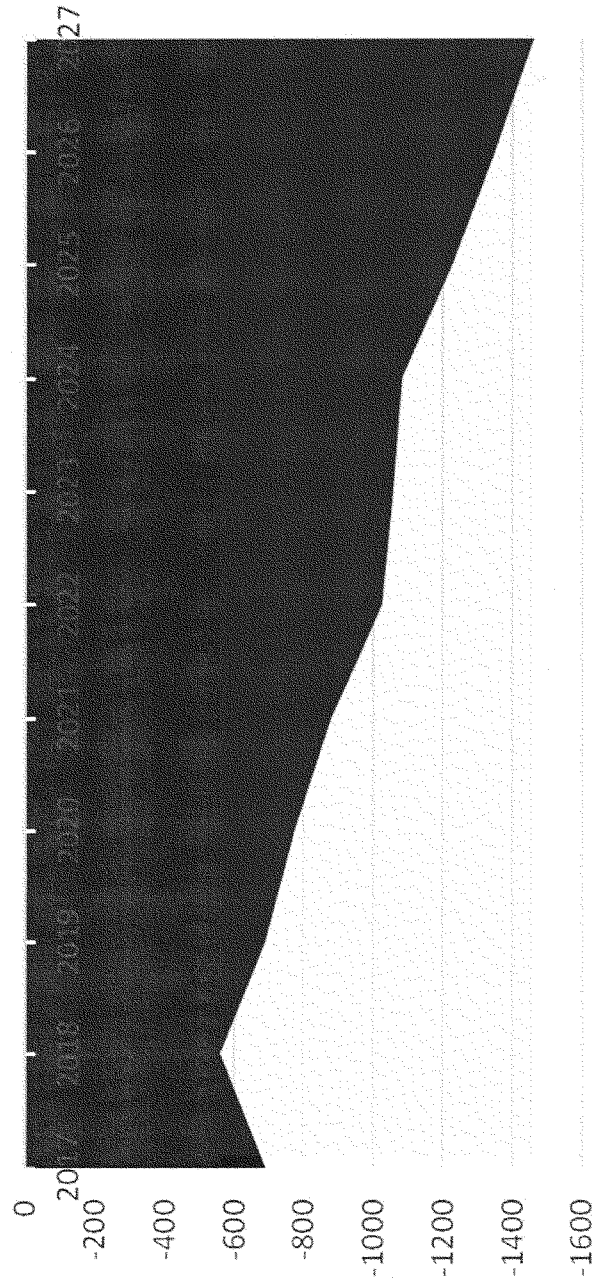
- Wall, Larry. 2017. "Interest on Reserves." *Notes from the Vault*, Federal Reserve Bank of Atlanta, February.
- Weiner, Stuart. 1985. "Payment of Interest on Reserves." Federal Reserve Bank of Kansas City *Economic Review*, January: 16-31.
- Wilkinson, Jim and Jon Christensson. 2011. "Can the Supply of Small Business Loans be Increased?" Federal Reserve Bank of Kansas City *Economic Review*, April: 35-57.
- Williamson, Stephen. 2016. "Interest Rate Control Is More Complicated Than You Thought." *The Regional Economist*, Federal Reserve Bank of St. Louis, April.
- Williamson, Stephen. 2017. "Balance Sheet Blues." *New Monetarist Economics* (Blog), February.
- Yellen, Janet. 2017a. "Transcript of Chair Yellen's Press Conference." Board of Governors of the Federal Reserve System, June 14.
- Yellen, Janet. 2017b. "Semiannual Monetary Policy Report to the Congress." Testimony before the Committee on Financial Services, U.S. House of Representatives, July 12.

## Federal Debt as % of GDP





# The "Official" "Plan" to "Balance the Budget" Projected Annual Deficit Spending



House Budget – 01/2017