Did Macroeconomic Policy Play a Different Role in the (Post-2009) Recovery?

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Abstract

How has macroeconomic policy been different in this recovery? In banking and regulatory policy, it has been distinguished from earlier patterns—or from what we thought earlier patterns implied for a shock this large and this persistent—in a relative unwillingness to apply the "penalty rate" part of the Bagehot Rule and in a slowness to restructure housing finance that are, for me at least, different than I had expected. In fiscal policy, the prolonged reign of austerity in an environment in which both classical and Keynesian principles suggest that it is time to run up the debt is surprising and unexpected, to me at least. In monetary policy it is more difficult to say what has been different and surprising in this recovery. There have been so many aspects of monetary policy and our expectations of what policy would be during a prolonged excursion to the zero lower bound that it is hard enough merely to say what monetary policy has been, and too much to ask how it has been different from whatever baseline view of what the policy rule would be that we ought to have held back in 2008.

Introduction

The shocks of 2008-9 put us in the extreme lower tail of the distribution—or at least of what was thought to be the distribution—of macroeconomic outcomes.

The lower-tailness of the outcome of the past decade consists of three factors:

1. The size of the shock arising from what appeared *ex ante* to be relatively small and manageable balance-sheet vulnerabilities.
2. The failure of the tools that the Federal Reserve and other North Atlantic central banks had thought would allow them to build firewalls between financial disturbances and the real economy of production, spending, and employment—and the consequent magnitude of the economic crash of 2008-2009.
3. The slow and incomplete nature of the subsequent recovery. Of employment, production, productivity, price levels, and unemployment rates, only the last is in a range that reasonable forecasts as of 2007 would have anticipated.

I know that I, at least, have been surprised at every step of this chain. In the mid-2000s I was looking for financial tail risks to come from Wall Street banks having sold unhedged foreign-exchange puts via derivatives and thus transformed dollar-denominated into euro-, yen-, pound-, and renminbi-denominated debts. In the context of a possible substantial downward realignment of the value of the dollar, that seemed to me to be a plausible source of trouble. Truly mammoth and unmanageable financial shocks were, I believed, almost surely confined to countries with balance sheets suffering severe currency mismatch (Obstfeld (2012)). Subprime was not a plausible source. Yet Eichengreen and O'Rourke (2009, 2010, 2012), tracking the downturn in real time, made a convincing and so far unrefuted case that the magnitude of the initial shocks coming from the financial sector and impacting the real economy of spending, production, and employment were at least as large as those of the Great Depression.

In 2008-9 I was confident in the strength of the monetary policy tools that had enabled the Federal Reserve to substantially damp any real-side economic impact arising out of the financial disturbances of 1987's Black Monday on the stock market, 1990's S&L crisis, the 1994 collapse of the Mexican peso, the 1997 East Asian crisis, the 1998 trifecta of Korea and Russia and LTCM, the 2000 collapse of the dot-com bubble, and 9/11.

And back in 2010 I was expecting a bounce-back along the lines of the post-1982 recovery carrying the economy near to if not all the way back to its pre-criss trend. Large expansions in government purchases made irresistible by secularly low borrowing costs, quantitative easing on an unprecedented scale, helicopter money, credible forward guidance that returning nominal GDP to its pre-crisis path—I did not know which of these four would work, but I was confident that they all would be planned out, that those that seemed most promising would be attempted, and that at least one would succeed.

How far down into the lower tail of outcomes, both in terms of our Bayesian beliefs back in 2007 of the risks we faced and in terms of the true distribution of risks of which we were appalling ignorant, have we been carried? It is largely a matter of taste. Perhaps we would have assessed ourselves as facing large enough uncertainties that this would place us in the 5-10% lower tail—think that the past decade has been the kind of thing we expect to see once every century or two.

Perhaps we would have assessed ourselves as having greater knowledge and facing lesser uncertainties, such that finding ourselves in a place like this as being in the 1%-2% lower tail—think that this is the kind of thing that we really did, especially after the Great Depression, have the understanding and tools to head off, and that such an adverse combination of shocks, propagation mechanisms, and policy responses should only happen every half-millennium.

Thus the answer to the question of "did macroeconomic policy play a different role in the (post-2009) recovery than in other post-World War II recoveries?" has to be "yes". Of course the role of policy is different. It could not be otherwise. What we have seen over the past decade has been and in many ways is still a very different phenomenon than the other post-World War II business cycles.

But let me take the organizers' orienting question to be somewhat more subtle. Back before 2007 or so we had a sense of how macroeconomic policy—banking and regulatory, fiscal, and above all monetary—reacted to the course of the business cycle in attempting to head off trouble, in attempting to deal with shocks and crises, and in attempting to clean up the mess after the nadir. We followed some kind of implicit policy rule. From this perspective, the major orienting questions seem to me to be:

- Have we, since 2007 or so, kept following the implicit policy rule that we then understood ourselves to be following?
- Have the policies we have implemented had the effects and consequences that we used to expect that they would have?
- Was that pre-2007 policy rule the right policy rule to be following?
- What now do we wish that our pre-2007 policy rule had been?
- Why haven't we made larger mid-course corrections as we have been surprised by the outcomes that the world has dealt us?

And I will focus on the United States alone. The United States alone is already much too big a topic. I will spend a very little time on banking and regulatory policy as an arm of macroeconomic policy. I will spend a little more time on fiscal policy. And I will spend most of my space trying to think about monetary policy.

My principal guesses—for I am not at all sure that I have gotten this right—are:

(1) Back before 2007 our policy rule as far as monetary policy was concerned consisted of setting interest rates in a countercyclical fashion according to a near-consensus Taylor-type feedback rule. Deviations from this were allowed to achieve other goals, like assessing growth headroom created by technological innovations, and supporting constructive fiscal policy actions. There was, in addition, a willingness at the zero lower bound to go the extra mile with respect to open market operations and quantitative easing along the lines recommended by Friedman (1997). But there was not a willingness to engage in "helicopter money" along the lines of Bernanke (1999, 2002). And there was not a willingness to make credible promises to engage in stimulus that would be seen as "irresponsible" after the recovery was complete, as recommended by Krugman (1998).

(2) Back before 2007 our policy rule as far as fiscal policy was concerned was that fiscal policy was to be set on "classical" terms. The focus was to be on rightsizing the state, levying taxes efficiently, and achieving long run fiscal balance. Countercyclical fiscal policy was to be restricted to automatic stabilizers. Why? Because fiscal authorities could not operate discretionary countercyclical policies in a timely fashion, and were in any event not competent to choose appropriate policies. This reservation (fiscal automatic stabilizers aside) of fiscal policy to central banks was to hold even at the zero lower bound, for monetary policy was more than powerful enough to do the job.

(3) Back before 2007, our policy rule as far as prudential banking/regulatory policy was one of benign neglect. The continued existence of a substantial equity return premium implied that there was a substantial market failure involved in the difficulty financial markets had in mobilizing anything like society's total potential risk bearing capacity. Largely unregulated financialization and experimentation might well produce substantial benefits in making the mobilization of such risk bearing capacity easier. And there were few risks generated by such benign neglect of systemic financial risk because of the power of the Federal Reserve's monetary policy tools.

(4) Back before 2007, our policy rule as far as banking/regulatory crisis management was: In the event of a financial crisis, the Federal Reserve, the other banking regulatory agencies, and if necessary the Treasury—after seeking Congressional approval—should follow Walter Bagehot (1873), as interpreted and recommended by Kindleberger (1979). The Bagehot Rule is: In a financial crisis, (1) lend freely, (2) to institutions that are solvent but illiquid, but (3) lend at a penalty rate. No institution that receives financial support should, after the crisis is over, feel that it came out of the situation well. No institution should feel that the positions they adopted that created systemic risk still look like they were worth running. No executive should get rich as a result of the government's lender-of-last-resort activities. And if an institution is (a) insolvent but (b) systemically important? Resolve it immediately, zeroing out the equity, options, and mezzanine holdings of stakeholders.

(5) The effects of the policies that have been followed have been in the ballpark of what expectations had been, but have nevertheless been disappointing. The economy has been undershooting Federal Reserve—and market—expectations for a decade, but has not been undershooting expectations by a gross amount in any one year. The policy levers are connected. The linkages are just on the weak side, and the slippage is on the high side of what was thought likely.

(6) In retrospect, that pre-2007 policy rule was not the right policy rule.

(7) There is not even a near-consensus on what the right policy rule would have been.

(8) In large part our failure to make larger mid-course corrections toward the "right" policy rule is the result of our disagreements over what would have been the right policy rule. Thus the next move needs to be with the head.

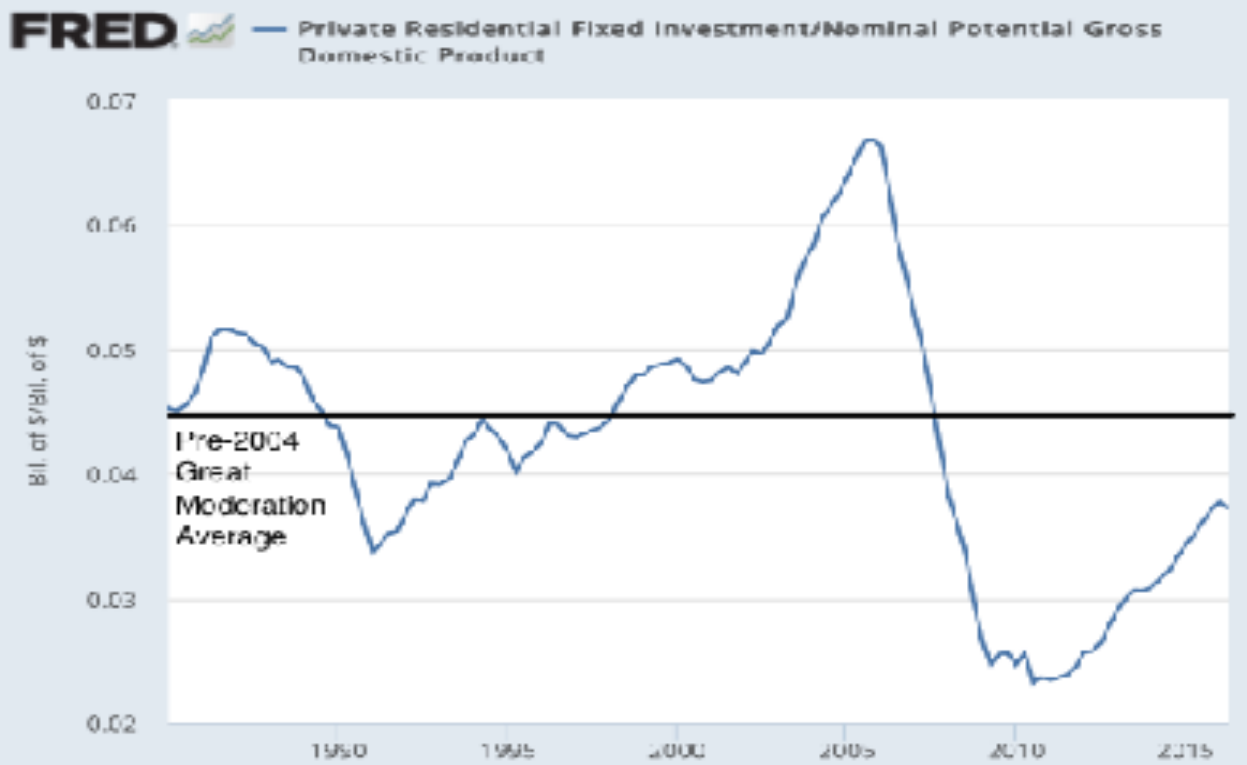
(9) If the Federal Reserve is going to continue to retain plenary countercyclical stabilization policy power, it needs—either via central banking custom or via explicit legislative powers, or both—more and better tools.

(10) If fiscal authorities are going to share some responsibility for countercyclical stabilization policy, they need to step up their technocratic game.

(11) In any event, better and stronger fiscal automatic stabilizers would potentially be a great help.

Banking and Regulatory Policy

The effects of the housing bubble on the stock of residential capital appear to be a triangle with a base four years wide and a height of 2%-points of GDP. That is 4%-point-years of GDP's worth of excess residential construction: that is roughly $600B. Not all of that excess construction was debt-financed. But some of the 16%-point years of GDP's worth of residential construction that would have been undertaken in any event were financed in an unusually debt-heavy manner given the extraordinary lax housing lending standards of the mid-2000s. And many homeowners with substantial and rising equity took advantage of the configuration of asset prices and lending standards to use their homes as giant ATMs (Greenspan and Kennedy (2005, 2007). But much lending, even at the margin, was of high quality—safe in the absence of a major depression.



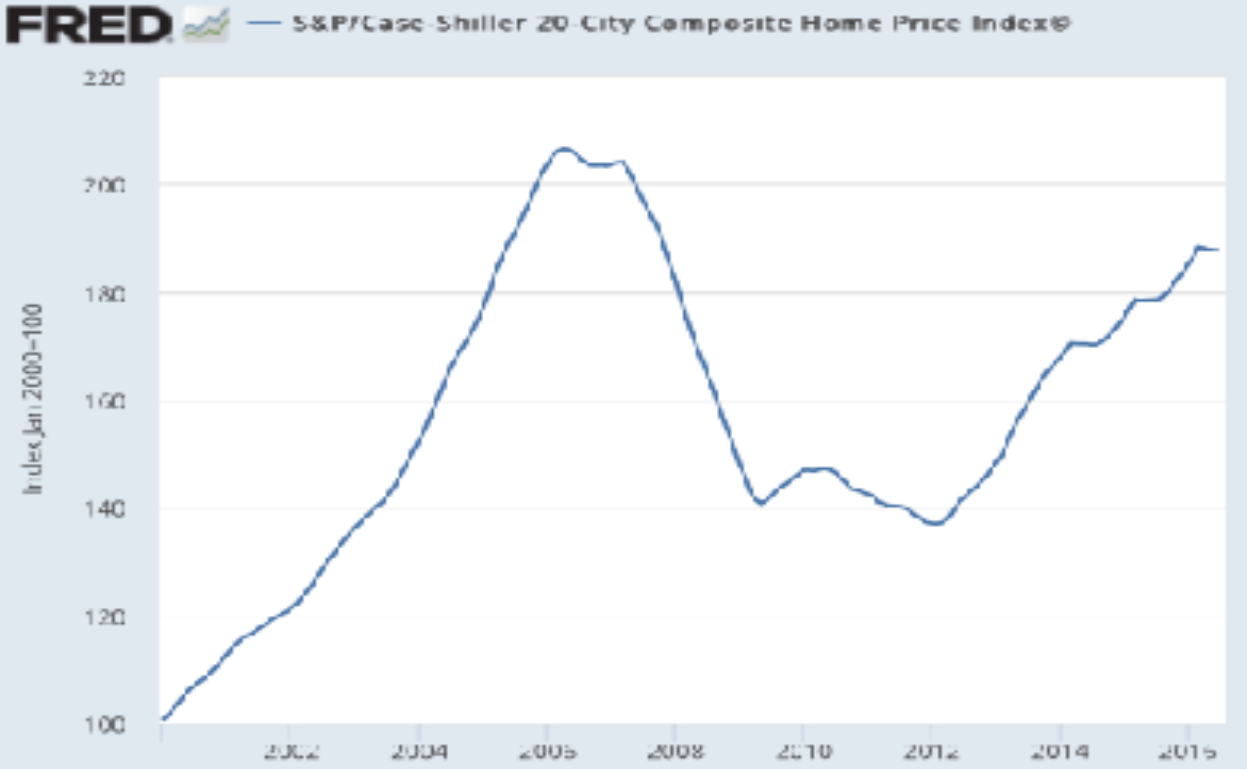
Thus it is difficult to see how even a rough estimate more than $1T of "fundamental" debt exposure of the financial system to the fact that the U.S. had become "overhoused" due to the wave of construction, much of it in the desert between Los Angeles and Albuquerque, driven by low interest rates and lax lending standards. Larger estimates of the triggering exposure soon find themselves relying on a multiple equilibrium story: the amount of risky debt was large because a depression threatened, and a depression threatened because the amount of risky debt was large (Krugman (1999), Chang and Velasco (1998)). Yet such models seem—or seemed—to be fully coherent only when there were hard limits to pick responses, canonically in the case of a central bank managing a weak currency trying to compensate for hard-currency overleverage.

In a world in which U.S. tradable financial assets approach four times U.S. annual GDP, and in which the U.S. is roughly a third of an integrated global economy, such $1T of "fundamental" debt exposure seems, to me at least, an order of magnitude too small to pose systemic risks in an economy that had swallowed the $4T of dot-com bubble equity losses. The conventional explanation is the use of derivatives not to lay off but to concentrate risk, as outlined by Weber (2013):

> in Davos, I was invited to a group of banks—now Deutsche Bundesbank is frequently mixed up in invitations with Deutsche Bank. I was the only central banker sitting on the panel. It was all banks. It was about securitizations. I asked my people to prepare. I asked the typical macro question: who are the twenty biggest suppliers of securitization products, and who are the twenty biggest buyers? I got a paper, and they were both the same set of institutions.
>
> When I was at this meeting—and I really should have been at these meetings earlier—I was talking to the banks, and I said: "It looks to me that since the buyers and the sellers are the same institutions, as a system they have not diversified". That was one of the things that struck me: that the industry was not aware at the time that while its treasury department was reporting that it bought all these products its credit department was reporting that it had sold off all the risk because they had securitized them…

But why highly leveraged institutions that have tried very hard to develop a comparative advantage in risk assessment and risk bearing would behave this way is a very loose end. I find Gorton (2010, 2012) very insightful on "how?!", but less so on "why?!". And Kindleberger (2000), "In my talks about financial crisis over the last decades, I have polished one line that always gets a nervous laugh: 'There is nothing so disturbing to one's well-being and judgment as to see a friend get rich…'", does not get us much further. Neither does Greenspan (2008): "Those of us who have looked to the self-interest of lending institutions to protect shareholders' equity, myself included, are in a state of shocked disbelief."

The disproportion between the vulnerability, the shock, and the effect on the economy appears even more puzzling with the reflection that the housing bubble of the mid-2000s was not all that large. If one trusts the Case-Shiller composite home price index, only starting in March 2004 would values ever be impaired by more than 10% on a nationwide basis; only starting in January 2005 would values ever be impaired by more than 20%; and housing values today were only exceeded between May 2005 and October 2007 and are within 10% of their all-time April 2006 high.



There was an overshoot of housing prices during the bubble, yes. But there was also an appreciation of fundamentals—the interaction of NIMBYism, the slowdown in infrastructure construction, increasing density and thus central place price gradients, and reduced real interest rates. The view that banking and regulatory policy was not only different but created extraordinarily large vulnerabilities in the housing sector seems to me to be difficult to sustain.

Also difficult to sustain, in my view at least, is the view that the difference was made by the root of all evil that was the repeal of Glass-Steagall. Yes, universal banks that can draw on government-insured deposits to support their high-risk investment banking businesses can and have a strong incentive to play: "heads we win, tails the government loses". Yes, the belief now appears naive that what investment banking needed to increase its efficiency and decrease its margins was more competition from other firms funded by insurance companies like Travelers and commercial banks like Bank of America. But it wasn't the universal banks that took on excessive risk relative to their peers in 2007-2008. The pure investment banks matched them. And of the pure investment banks, only Goldman Sachs and Morgan Stanley survived as independent actors.

Back before 2007, our policy rule as far as prudential banking/regulatory policy was concerned appeared to be one of a policy drift toward "benign neglect". It is my sense that underlying the policy drift in three areas—relative lack of concern about what willing lenders and willing borrowers wanted to do with each other with respect to making mortgages, relative lack of concern with supervising and enforcing transparency and prudence standards on the rapidly growing derivatives markets, and relative lack of concern with making sure that the risk management departments of major financial institutions were in fact managing risk—were two largely separate beliefs:

The first was that whatever small systemic risks were created by cowboy finance in housing and elsewhere were systemic risks that the Federal Reserve could effectively manage. Largely unregulated financialization and experimentation might well produce substantial benefits in making the mobilization of such risk bearing capacity easier.

The second was that the large profits apparently earned from bearing risk suggested that anything that promised to mobilize more risk bearing capacity and bring it to the financial markets should be encouraged. The continued existence of a substantial equity return premium implied that there was a substantial market failure involved in the difficulty financial markets had in mobilizing anything like society's total potential risk bearing capacity.

And there were believed to be few risks generated by such benign neglect of systemic financial risk. The power of the Federal Reserve's monetary policy tools meant that it could, afterwards, neutralize and clean up and thus handle the situation.

As former Federal Reserve Bank of New York Vice President Charles Steindel commented on my website: "Remember that Ned Gramlich's book [on housing and subprime] did not raise any macro alarms…" and "we foolishly did not believe that any mess being created in the mortgage market would have profound macroeconomic consequences…" Given the small size of the subprime market relative to global financial flows and assets, and given the success of the Federal Reserve at constructing its firewalls in episodes like the 1987 stock market crash, 1990 S&L, 1995 Mexico, 1997 East Asia, 1998 LTCM, 1998 Russia, 2000 dot-com, and 2001 9/11, it is hard to see how the judgment could have been very different *ex ante* as far as housing is concerned. The Fed had managed to handle all of these: why should the aftermath of a housing bubble have different consequences?

Derivatives and the balance sheets of systemically-important financial institutions is a different matter.

More worrisome to my mind is the difference between actual crisis policies on the one hand and those that would have been appropriate according to standard yardsticks on the other. Back before 2007, I at least had policy rule as far as banking/regulatory crisis management was: In the event of a financial crisis, the Federal Reserve, the other banking regulatory agencies, and if necessary the Treasury—after seeking Congressional approval—should follow Walter Bagehot (1873), as interpreted and recommended by Kindleberger (1979). The Bagehot Rule is: In a financial crisis, (1) lend freely, (2) to institutions that are solvent but illiquid, but (3) lend at a penalty rate. No institution that receives financial support should, after the crisis is over, feel that it came out of the situation well. No institution should feel that the positions they adopted that created systemic risk still look like they were worth running.

No executive should get rich as a result of the government's lender-of-last-resort activities. And if an institution is (a) insolvent but (b) systemically important? Resolve it immediately, zeroing out the equity, options, and mezzanine holdings of stakeholders.

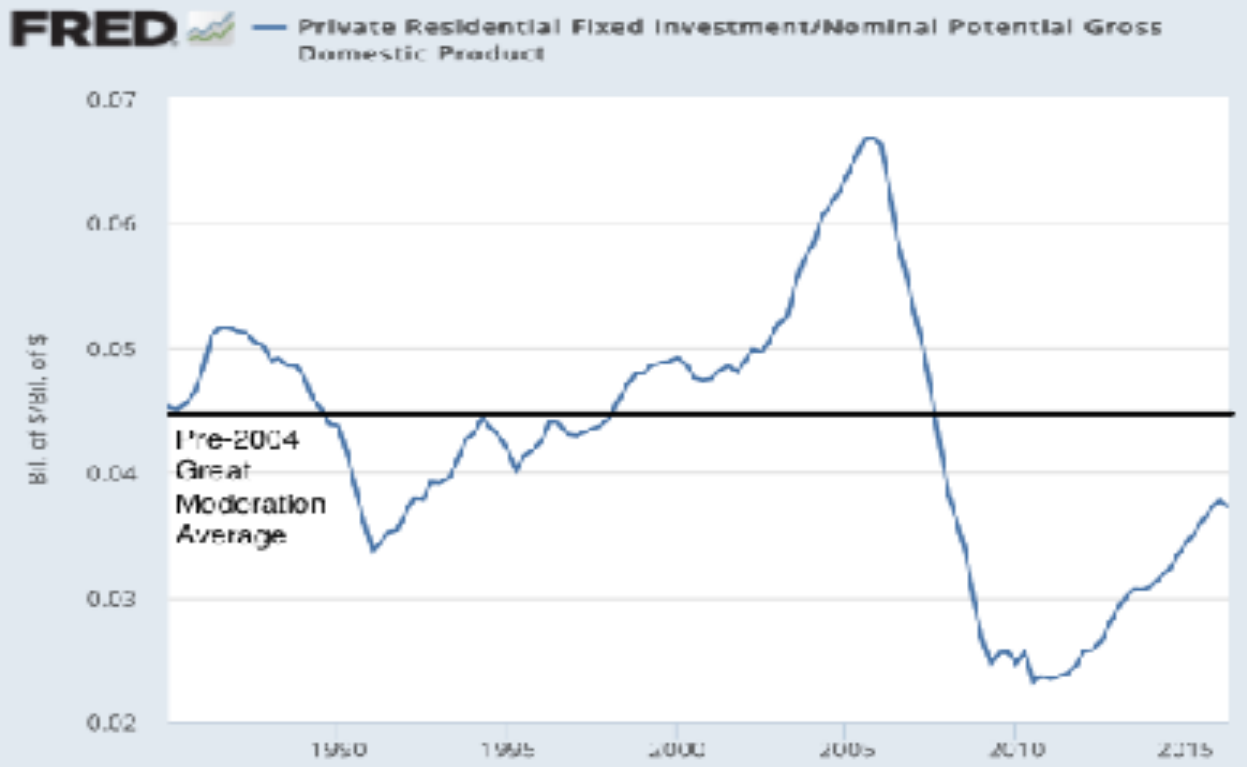
Certainly during the resolution of Bear-Stearns the Federal Reserve and the Treasury, with their insistence that the price of Bear-Stearns equity in the resolution be not the $60-$70 a share at which it had been trading before the weekend but rather first $3 and then $10 certainly counts as a "penalty rate". And nobody can say that the failure of the lender-of-last-resort to appear for Lehman was in any sense enabling and encouraging moral hazard for the future (cf. Ball (2016)).

But after that concern that those who had created systemic risk not emerge from the crisis whole seemed to fall by the wayside. Even replacement of the most senior executives by their juniors as a condition of institutional survival—something that would have been relatively popular among the former-juniors-now-seniors—was not enforced. And the spectacle of the U.S. Treasury lending at 5% per year with no control rights at at moment when Warren Buffett is getting 10% per year plus substantial equity kickers and potential control rights appeared distinctly odd.

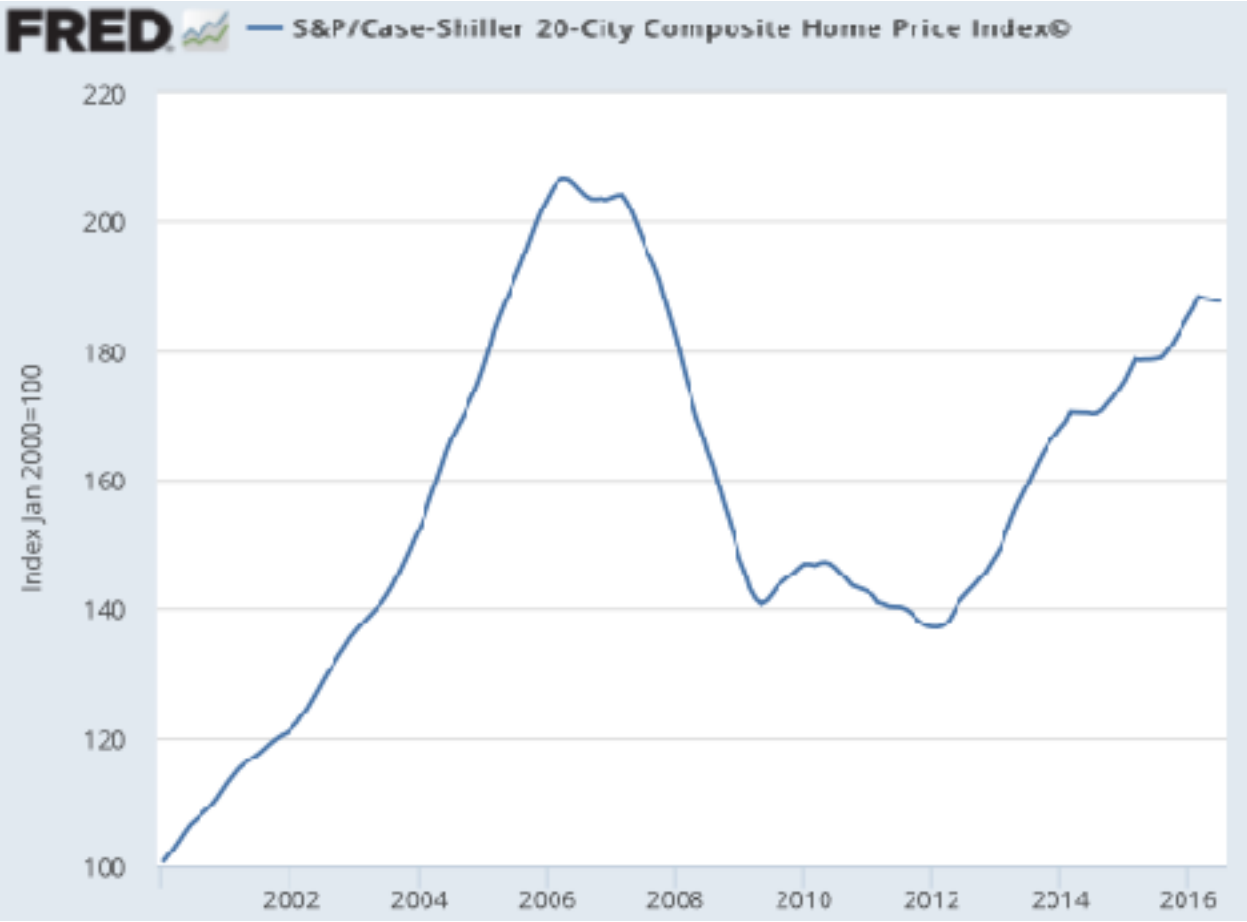
A great many questions are still unanswered, or at least not fully answered to my satisfaction: Was legal authority to resolve Lehman in September 2008 really absent? If so, then was it not gross central banking malpractice not to have resolved Lehman at the last moment that legal authority existed—at the instant, whether it was in April or June or August, that it crossed from being solvent and liquid but potentially illiquid to insolvent? Why did so many institutions evade temporary receivership and then sale to a new set of equity holders when for a year or more their equity value was merely the fumes from expected government support? Was not further shaking the confidence of bankers truly such a necessary priority? Or is the "penalty rate" part of the Bagehot Rule playbook unattainable in practice? The disturbing thing is that I do not feel qualified to judge these issues, even now.

There is one additional area in which regulatory policy during the crisis and recovery has been different than I did or would have back in 2007 have expected it to be: the regulatory structure of housing finance and the role of the GSEs in it.

The structure of housing finance back before 2008 pleased nobody save the high executives and lobbyists of FNMA and FHLMC, and perhaps their congressional partners. It is now more than eight years since they were put into receivership. Yet if there is a plan for the long term institutional structure of mortgage finance in the United States and for their role in it, I am not aware of that plan. It is difficult to imagine how many private financial institutions would feel confident extending market share or placing large bets in a market where the typical instrument has a thirty year lifetime and the only certainty is that the future institutional structure of the market is uncertain. It is difficult for me at least to look at the cost of capital as measured by interest rates today, at the level of housing prices, and at the level of residential construction and see the current situation as a reasonably healthy one.



Even if America was substantially "overhoused" as of the end of 2007 by the yardstick of the share of potential GDP devoted to residential construction during the pre-2004 Great Moderation era, it is by that or any other yardstick "underhoused" today. Regulatory uncertainty here with respect to the long run cannot be good. Back in the mid- and late-2000s Phil Swagel (2010) and many others (cf. Treasury-HUD (2011)) had many ideas, many of them good, for a better housing finance infrastructure. Why does there not seem to be even a plan today?



Fiscal Policy

The near-consensus policy rule for fiscal policy's countercyclical role back in 2008 was simple: it had none. Automatic stabilizers were allowed to function, were even encouraged, and it seemed harmless to allow congress to make its overwhelming and very popular votes to extend the term of unemployment insurance in high unemployment states during recessions and in the early stages of recovery.

But Taylor (2000) serves as a powerful and eloquent marker of the crystallization of opinion that fiscal policy should be set according to "classical" principles: rightsizing the state, levying taxes efficiently, and achieving long run fiscal balance, with countercyclical fiscal policy was to be restricted to automatic stabilizers. Why? For three reasons:

- Discretionary fiscal policy was unnecessary as a countercyclical policy tool, because monetary policy could do the job.

- Discretionary fiscal policy was ineffective as a countercyclical policy tool, because decision and implementation lags were just too long.

- Discretionary countercyclical policy was counterproductive as a countercyclical fiscal policy tool, because legislators and their staffs were not competent to choose appropriate policies even when they wished to do so.

Unnecessary, ineffective, and counterproductive—plus the excuse of needing to run deficits and have government buy things to boost employment provided legislators with an excuse to ignore the "classical" principles that they should be focusing on, especially in an environment in which rapidly rising medical care costs and the aging of America made achieving long run budget balance an extremely difficult political task. That legislators turned out not to be terribly good at providing the social insurance system with an efficiently-collected and adequate revenue stream to fund it over the long run provided no excuse for them to dabble in other policy areas, for only they could do anything to achieve that essential task. Hence as long as the countercyclical stabilization policy mission could be offloaded onto any other group—and it could be offloaded onto central banks—it should be.

The abandonment of discretionary fiscal policy did not lead to economists' redirecting their energies towards thinking about fiscal automatic stabilizers. Indeed, only a few pieces like Blanchard (2000) and Fatas (2009) have kept automatic fiscal policy also from dropping to infinitesimal mindshare. I speculate that perhaps this was driven by intellectual imperatives within economics. Once the default macroeconomic model has a central bank using an interest rate tool to stabilize inflation driven by some Phillips Curve mechanism, save possibly at the zero lower bound the presumption is that the central bank will engage in what DeLong and Summers (2012) call "full monetary offset".

In "full monetary offset", the central bank will have a strong view of what point on the short run Phillips curve it should be aiming for. It will not allow the fiscal authorities to joggle its elbow: it will take steps to offset any impact of fiscal policy —discretionary or automatic—on spending that pushes spending away from the level the central bank considers appropriate.

Moreover, initially at least, the possibility of arriving at the zero lower bound did not lead to a complete reconsideration of the exclusive assignment of responsibility for countercyclical stabilization policy to monetary policy and the central bank. As Weinzerl and Mankiw (2011) demonstrate, even at the zero lower bound on short term safe nominal interest rates if a central bank can commit to the future money stock and thus to the future full-employment price level then there is no obvious theoretical need for fiscal policy as an additional stabilization policy tool for a central bank willing to use its policy tools. In any model in which there can be expected inflation that is neutral with respect to output, the central bank's ability to set the rate of expected inflation is as good a stabilization policy tool as its ability to set the nominal interest rate.

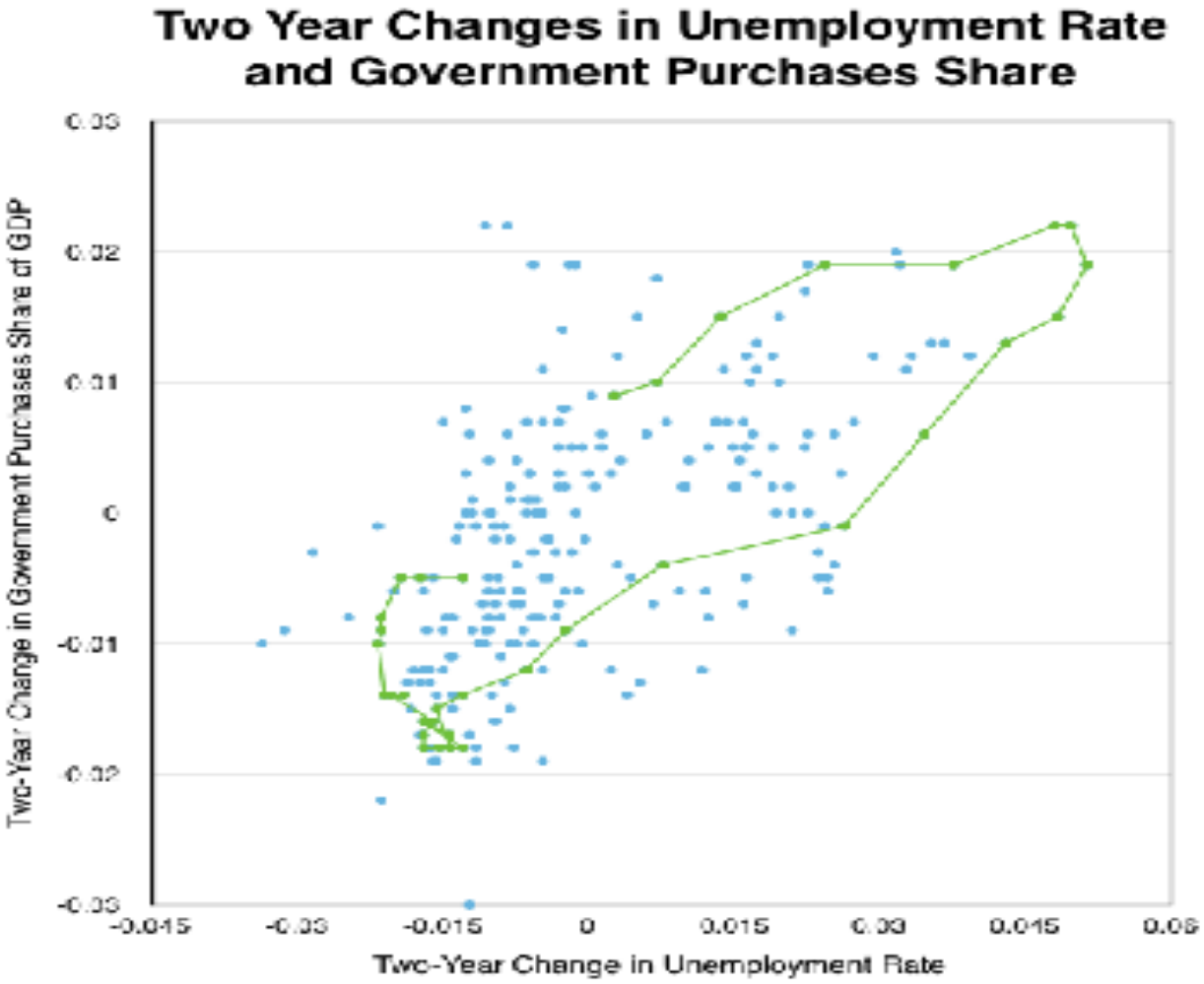
Writing about policy at the zero lower bound, Friedman (1997) does not mention the possibility of fiscal policy. Bernanke (2002) speaks of how cooperation from the fiscal authorities "significantly enhances" the stimulative effects of monetary policies. But Krugman (1998) wonders whether fiscal policy would in fact be effective at the zero lower bound:

> A recovery strategy based on fiscal expansion would have to continue the stimulus over an extended period. Which raises the quantitative question of how much stimulus is needed, for how long-and whether the consequences in terms of government debt are acceptable…

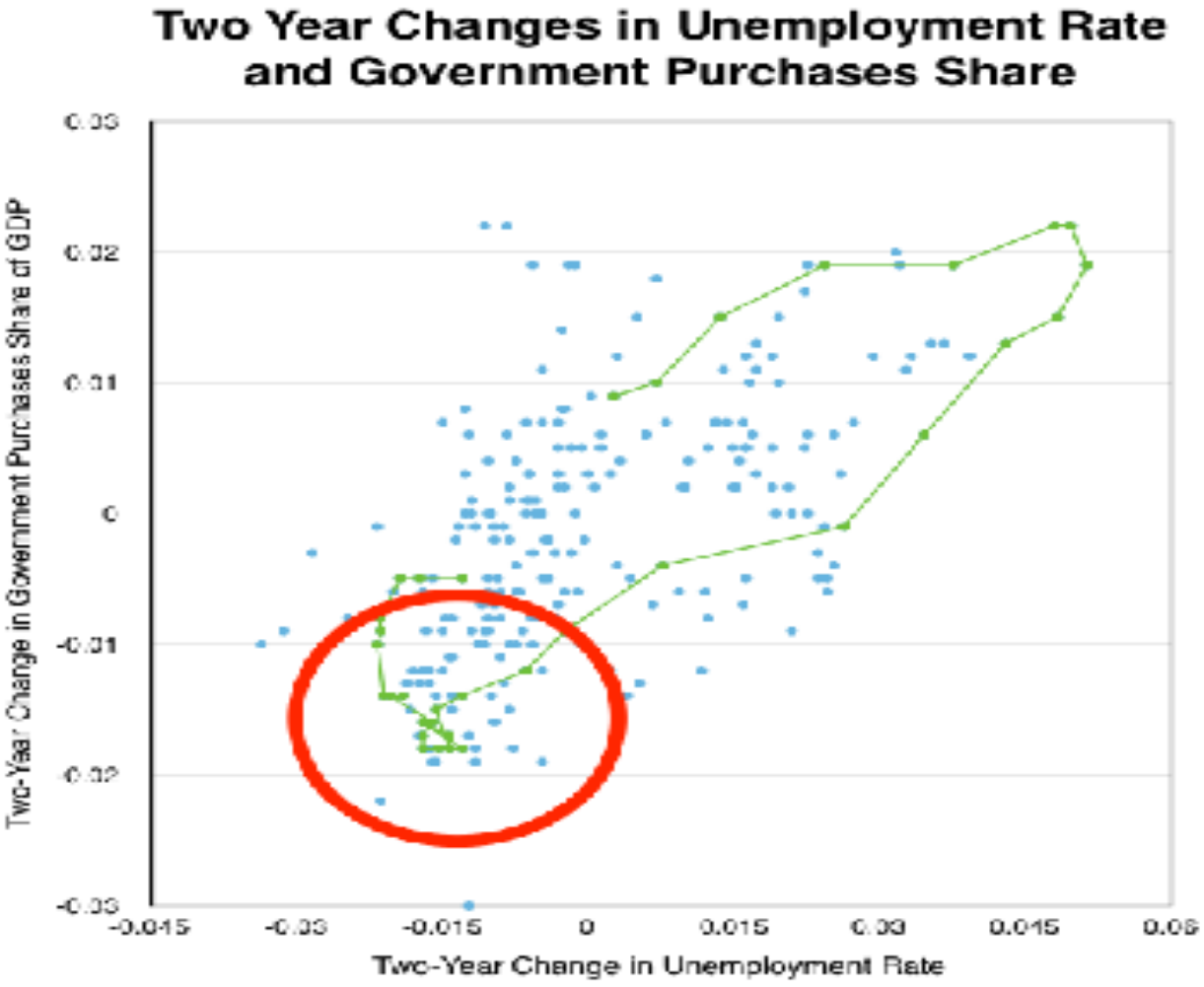
At the very least, it was not clear even within economics that fiscal policy would fully come back onto the countercyclical policy menu should interest rates hit their zero lower bound.

With the coming of the recession in 2008 the federal government's tax and transfer automatic stabilizers followed their usual pattern, with perhaps congress voting, initially, slightly more generous expansions of unemployment insurance than had been typical (Stone and Chen (2014)). The green line in the figure below starts in the first quarter of 2008 when the two-year change in the unemployment rate turns positive, and shows in percentage points the two-year changes in the unemployment rate and the government purchases in GDP thereafter.

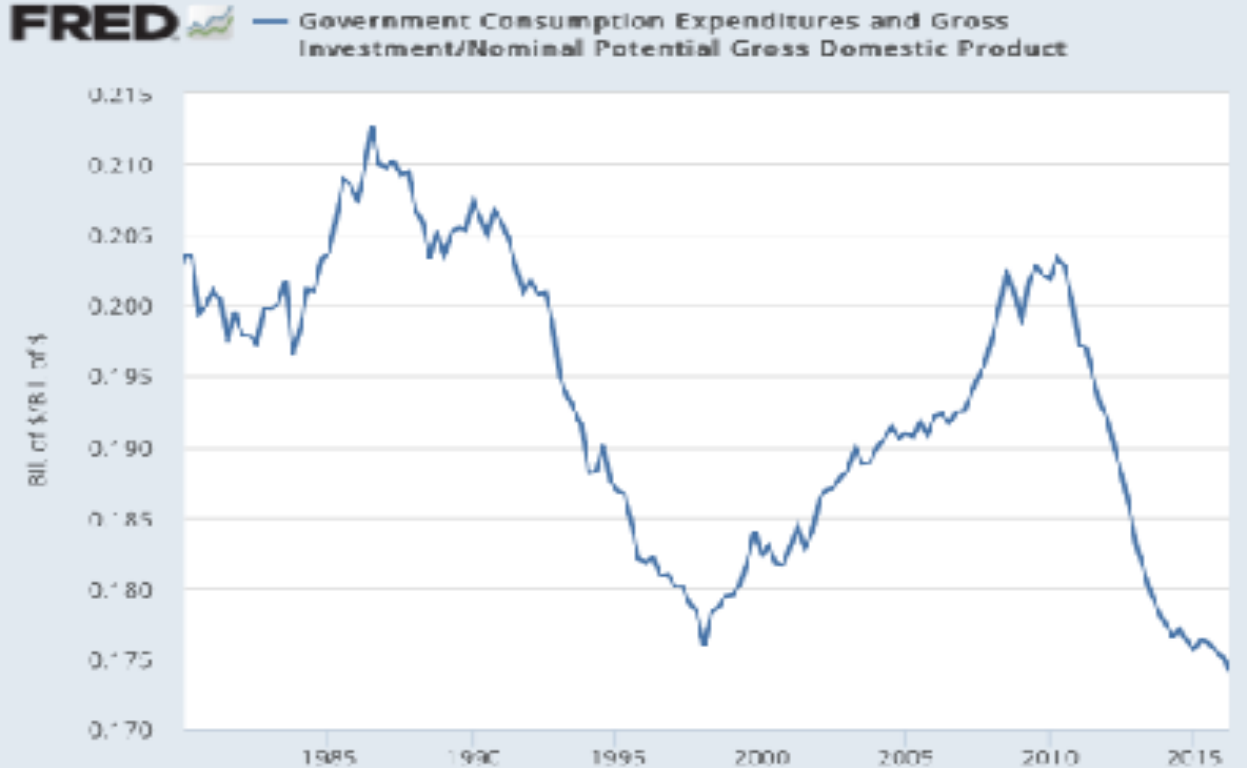
The initial stimulus in government purchases according to this framework starts out ahead of the curve: government purchases as the two-year change in the unemployment rate turns positive are already nearly one percentage point above e their value as of two years before. From then until the end of 2009 this measure of expansionary fiscal policy traces out the upper limit of the post-1954 scatter. By the end of 2009 the two-year changes in both the unemployment rate and the government purchases share of GDP are off the previous scale.



Thereafter things shift. As the two-year unemployment rate change first shrinks in 2010 and then turns negative in 2012, the two-year change in the government purchases share false and turns negative in 2011: government purchases in 2011:I are a smaller share of GDP than they were in 2009:I. The economy then heads for the lower left corner of the observed post-1954 scatter, where it sticks. From 2011:II until the present, the government purchases share of GDP has shrunk by an average of 0.6%-points/year for what is now more than five years. One-quarter of this shrinkage is federal. Three-quarters is state and local. And the cross-state shrinkage of the government purchases share is large, and follows the pattern you would expect: southern and prairie states cutting back on purchases; mid-Atlantic, northeast, and Pacific states not.



This is a big, and unprecedented deal. Previous excursions to the bottom left quadrant of this graph have been much more transitory, with the exception of the 1990s Bill Clinton-era of budget rebalancing. But monetary policy in the 1990s had the room to assist in the redeployment of productive resources to other categories of spending that monetary policy since 2008 has not.



In an environment of slack resources, stagnant wages, and exceptionally low interest rates, it does not fit any set of "classical" policy recommendations other than one that starts presuming that as of 2008 the marginal government purchase had very low value indeed. It might be rationalized by a belief that the shadow cost of accumulating government debt is extremely high because it sharply raises the risk of future financial crisis, or acts as a drag on growth as in Reinhart and Rogoff (2010). But such arguments are difficult to sustain with interest rates as low as they have been and still are with even small hysteresis effects (cf. Blanchard and Summers (1986), DeLong and Tyson (2013)).

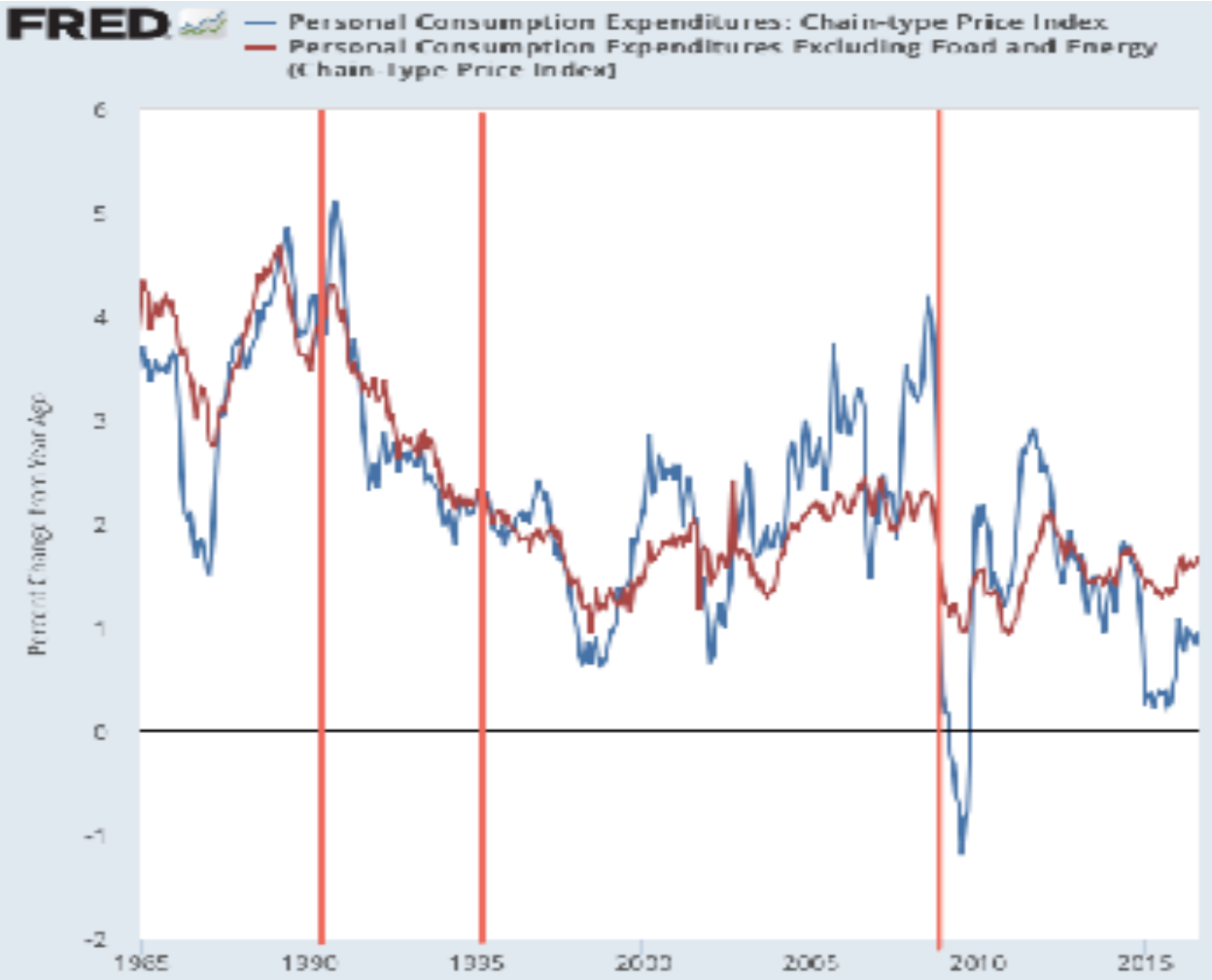
Federal Reserve chairs have certainly not believed that this fiscal policy configuration has made their lives easier (cf. Bernanke (2015), Yellen (2016)). The canonical channel (Mankiw (2015)) through which a reduction in government purchases and in the government's borrowing requirements avoids inflicting downward pressure on spending, production, and employment is if the reduction in purchases is accompanied by a sufficiently large fall in interest rates to induce offsetting increases in investment and consumer durables purchases, and to induce a fall in currency values from which will follow an increase in investment spending. But at the zero lower bound that channel cannot operate.

Monetary Policy

At least since the start of the 1970s, the principal focus on monetary policy here in the United States has been inflation control. That focus is dominated by the experience of the 1970s; by the high cost in terms of unemployment, lost production, and slack in the early 1980s to eliminate the inflation of the 1970s; and by the subsequent belief on the part of nearly everyone associated with the Federal Reserve system that the anchoring of inflation at a relatively low level is an achievement that is very valuable, was very expensive to buy, and must not be risked.

The post-1984 "Great Moderation" era was thus extremely gratifying to a Federal Reserve that had been profoundly shaken by economic outcomes between 1970 and 1984. The low level and low volatility of inflation, combined with the "divine coincidence" of Blanchard and Gali (2007) that this seemed to bring with it low real-side cyclical volatility as well, convinced many that some sort of sweet spot had been attained.

Policymakers admitted that some of it had simply been good luck in terms of the relative absence of large shocks (Stock and Watson (2003)). Policymakers admitted that some of it had been good fortune in terms of the extra freedom opened by the post-1995 productivity speedup (Blinder and Yellen (2001)). But there remained a considerable piece that was regarded as a valuable treasure held by the Federal Reserve. Therefore the first imperative of monetary policy as made by the modern Federal Reserve as it has developed since 1984 or so is: do not risk the anchoring of inflation and inflation expectations at their low level.



But at what low level? What should the inflation target be? Or, perhaps, instead:

- What is the set of inflation rates with which the Federal Reserve is comfortable?
- What are the triggers that will induce the Federal Reserve to focus and take action, rather than worry, drift, and nudge?

Assessing whether and to what extent monetary policy since 2008 has been different and behaved differently requires we have a view of what our inflation target was, both explicitly in what was said and implicitly in what outcomes would either move the Federal Reserve out of its comfort zone or trigger action. Was the Federal Reserve targeting inflation during the Great Moderation?

The answer is: yes and no.

At any moment, there was a band of inflation rates and a set of trajectories with which the Federal Reserve was comfortable. Deviations would induce worry, pressure, and action—eventually. There were triggers that would induce an immediate change of course. And policy was steadily drifting year-after-year toward a more formal inflation target as a way of attempting to manage expectations via commitment. By 2004 Larry Meyer (2004) was willing to say: "If you do not know that the Federal Reserve is targeting 2%/year inflation, you have not been paying attention…"

To help understand this process, I propose dividing the post-1984 "Great Moderation and Beyond" period into four pieces insofar as our understanding of what the Federal Reserve was aiming at in terms of inflation targets, or inflation comfort zones:

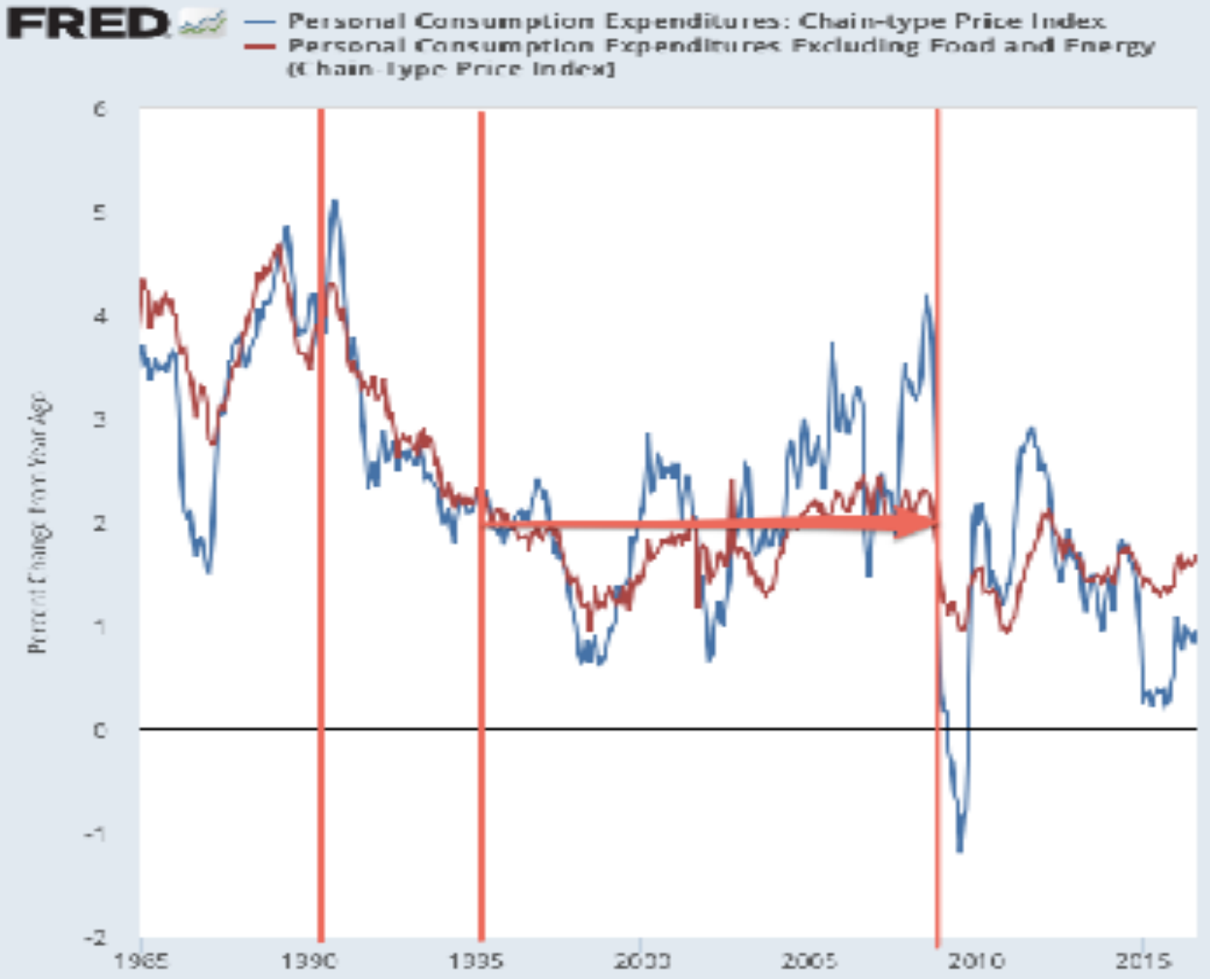
Before 1990: Comfort with 4%: The Federal Reserve appears comfortable with inflation in the range of 4% per year or so. The memory of the 1982 unemployment peak is still recent enough that there is little appetite for any policy steps to transform what appears gratifyingly low inflation by the standards of the 1970s into anything that could be called "effective price stability". But inflation rising and forecast to rise higher than 4% definitely carried the Federal Reserve out of its comfort zone, and triggered action—no matter what commitments George H.W. Bush's administration had thought Greenspan had made to them in 1997 back when Bush was Vice President (DeLong (2008)).

1990-1995: Opportunistic Disinflation: But as the memory of the unemployment spike of 1982 became more distant, a lower inflation rate than 4% came back on the Federal Reserve's menu as a desirable goal. But it was seen not as a policy to be pursued actively. It was, instead, something that was to be attained passively. The Federal Reserve, so the current of thought went, should not seek to reduce inflation, but should take advantage of opportunities in which inflation was by accident already reduced.

As Philadelphia Federal Reserve Bank President Edward Boehne said in 1989:

> Sooner or later, we will have a recession… If… we took advantage… and we got inflation down from 4.5 to 3% percent…. If we could bring inflation down from cycle to cycle just as we let it build up from cycle to cycle, that would be considerable progress…

And, of course, the recession he saw as coming "sooner or later" was already on the way.



1990 to 1995 sees the Federal Reserve "opportunistically" acquiesce in the reduction of inflation from 5% down to 2%. It was not a primary focus of Federal Reserve policy thinking. Policy thinking in those years was dominated by the S&L crisis, the recession, the "jobless recovery", the interaction between monetary and fiscal policy, the greater potential attractiveness of a "Wicksellian" as opposed to a Keynesian or a monetarist framework, and the peculiar gearing between short- and long-term interest rates apparently induced by the endogenous duration of mortgage-backed securities—plus the possible coming of a "new economy" and the declining weight of GDP. The reduction in inflation was for the most part just something that happened. And the Federal Reserve was not unhappy about it.

1995-2008: Stick at 2%: But thereafter "opportunistic disinflation" is not pursued further. There is no appetite for policies to reduce 2% to 0%. Rather, after 1995 inflation at a rate of 2% per year is redefined as "effective price stability", and held to fulfill the Federal Reserve's legislative mandate: that even if there were no impact on employment or growth, 2% would still be what the Federal Reserve would choose and would want to see.

A number of arguments were provided for this. Greenspan (1997) saw "a very high probability that the upward bias [in price measurement] ranges between 0.5… and 1.5%-points per year…" and said that true deflation should definitely be avoided. Long-term budget balance seemed a desirable goal that the Federal Reserve should assist with to the extent of not handing out large windfall real gains to holders of long-term government debt. Worries about curvature in the Phillips Curve as inflation approached zero along the lines of Akerlof, Dickens, and Perry (1996) concerned many.

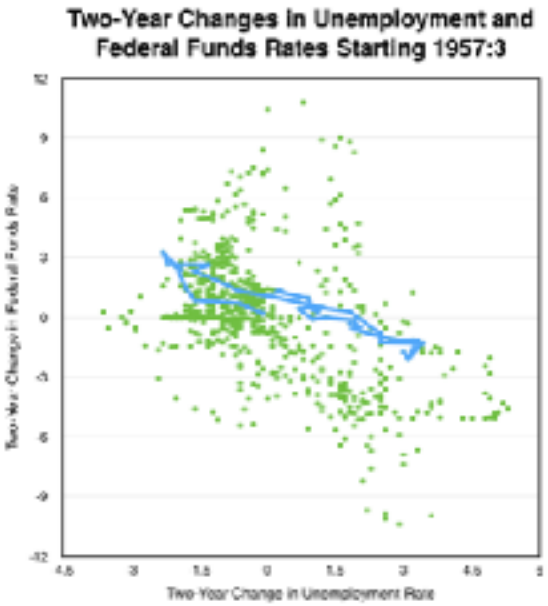
But the explicit cost-benefit analysis involved in the choice of target did not seem to be a major focus of discussion within the Federal Reserve system. Greenspan seemed to have chosen 2%, and the response seemed to be to fall in line and seek reason why this was a wise choice.

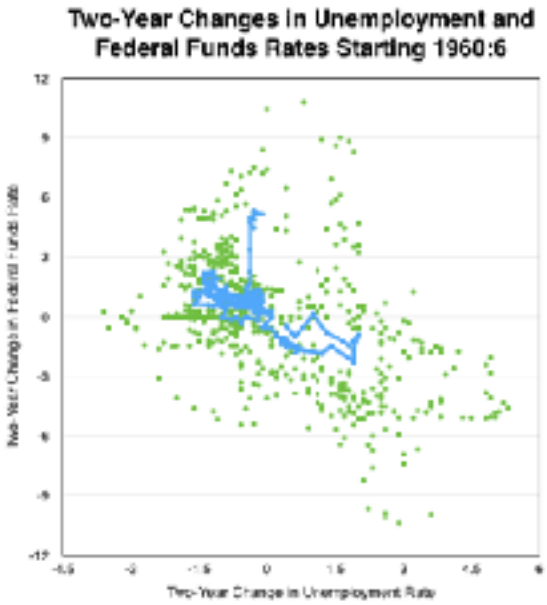
From today's perspective the stakes in those decisions to acquiesce in opportunistic disinflation to 2% and then to stick at 2% rather than heading for zero appear to have been very large indeed. And they seem worthy of more thought along the lines of DeLong and Summers (1992) Krugman (1998), DeLong (1999), Fuhrer and Sniderman (2000), Blanchard et al. (2010), and Ball (2014).

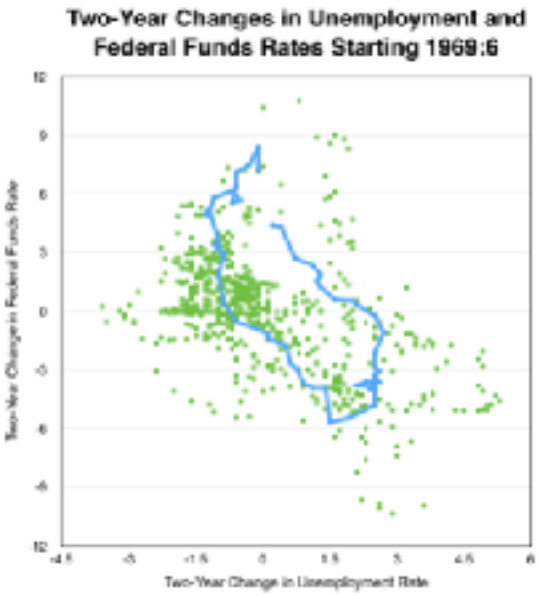
Post-2008: The Undershoot: Since 2008, of course, there is the persistent undershoot of the 2% inflation target by an average of about 0.5%-points. It is not that at the Federal Reserve has aimed at an undershoot. As of the end of 2009, the FOMC expected that inflation would increase and that the economy would strengthen sufficiently that it would normalize the Federal Funds rate to hailing distance of 5% within a timer period in hailing distance of three years. It is not as though the Federal Reserve was in some sort of a unique overoptimism bubble. Until recently, at least, markets have expected a much stronger outcome as well—although not as much stronger as history has delivered as the FOMC. Today markets are very pessimistic. And the FOMC expects to be able to normalize the Fed Funds rate to 3%… sometime…

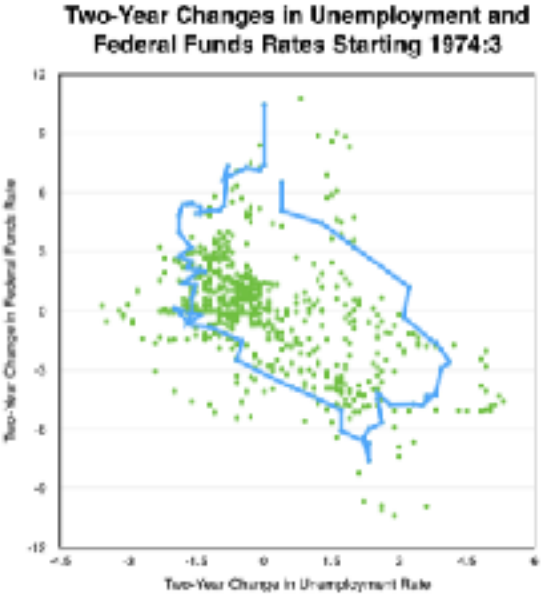
The longer this continues, however, the less convincing are arguments that it is due to forecast error, accident, and bad luck; and the more convincing are arguments that it is due to institutional biases and either policy choices or policy limitations that appear to make 2% more of a ceiling than of a target.

What have those monetary policy choices been since the start of 2008?







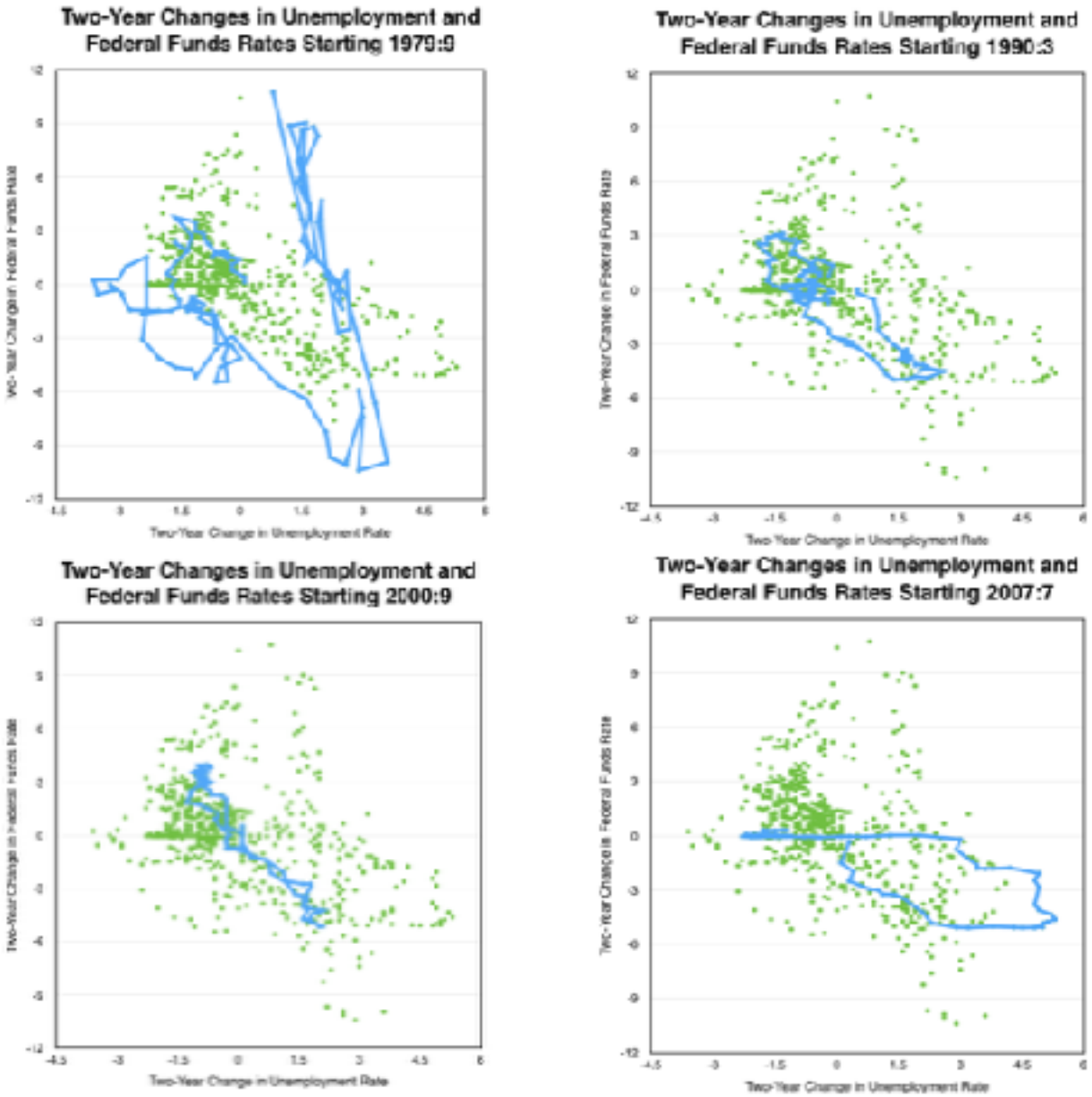


When a recession hits, and the unemployment rate starts to rise, the Federal Reserve sets about cutting the short-term safe nominal interest rates it controls. Sometimes it is ahead of the curve, cutting rates even before unemployment rises; sometimes it is behind the curve, scrambling to catch up. Sometimes it reacts more aggressively to the rise in unemployment, sometimes less. We see eight major episodes with substantial rises in the unemployment rate since the end of the Korean War, starting, respectively, in 1957:3, 1960:6, 1969:6, 1974:3, 1979:9, 1990:3, 2000:9, 2007:7 as the months in which the two-year change in the unemployment rate first turns positive. It is conventional to divide these into three groups.

The first, the unemployment rate increases beginning in 1957:3 and 1960:6 are the "Eisenhower" cycles. In them the Federal Reserve started out in a relatively neutral posture: at the moment that the two-year change in the unemployment rate turned positive, the two year changes in the Federal Funds rate were only +1.28%-points and-1.03%-points, respectively. It then reduced short-term safe nominal interest rates by a relatively small amount—much less than the typical gearing of 1 to 2 that a Taylor Rule associates with the comovement of interest and unemployment rates.

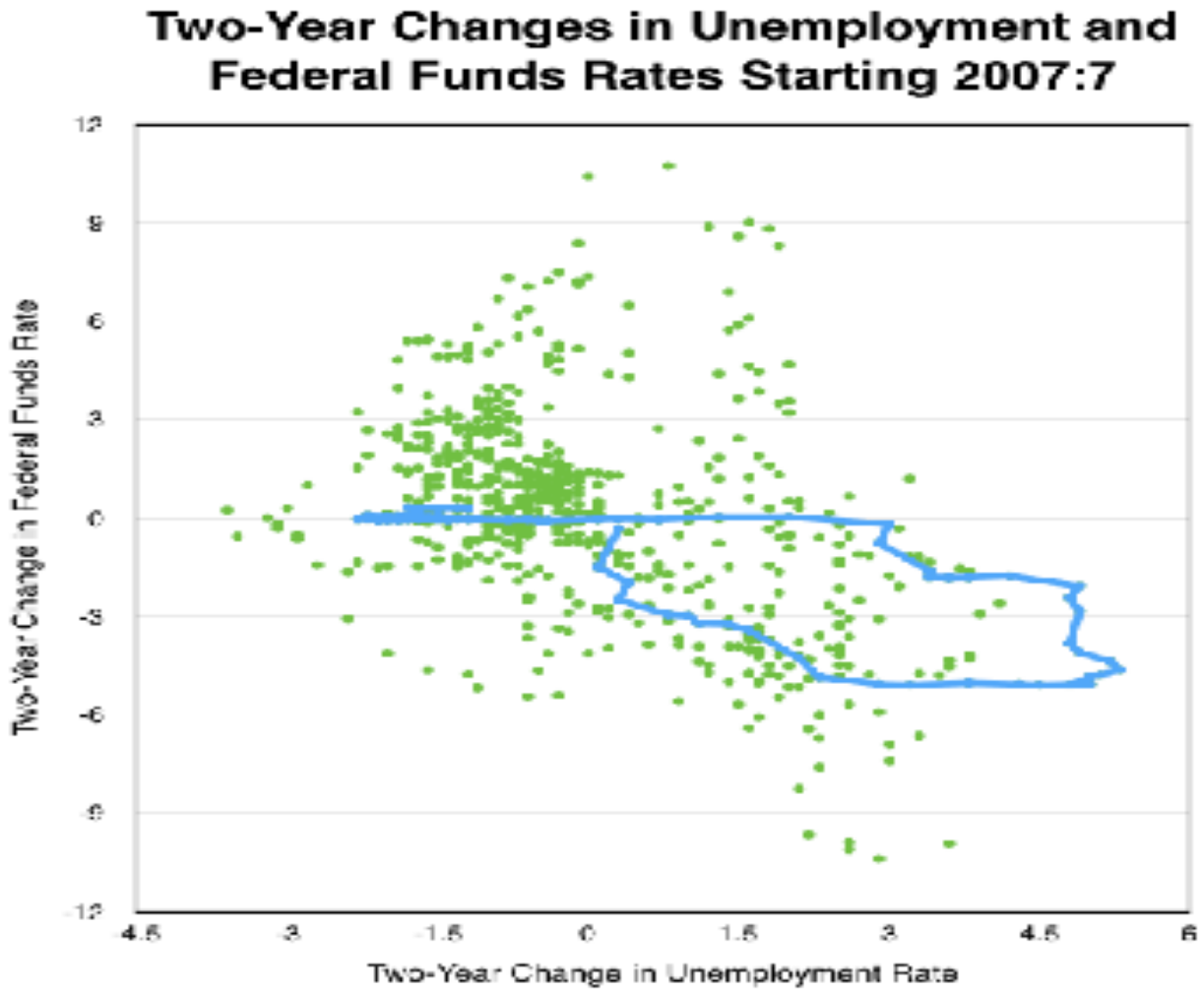
William McChesney Martin had confidence in the equilibrium restoring self-stabilizing properties of his economy, and was inclined to lean only moderately against the wind. This confidence may have been a key factor that led him into what we now judge as his largest mistake: the missing monetary tightening and unemployed rate rise of 1966.

Then come the three "murder" cycles—after Rudiger Dornbusch (1998) and many other places: "the Federal Reserve Chairman… in time-honored fashion murder[s] the expansion before it gets a chance to die of old age…" In these, the Federal Reserve is not ahead of or at the curve in terms of lowering interest rates to provide support to a weakening economy. It is, rather, concentrating first and foremost on reducing inflation, and hence welcoming at least the initial stages of the unemployment rate rise as showing that its policies are successfully creating slack. When the two-year change in the unemployment rate turns positive in 1969:6, the Federal Funds rate stands 4.38%-points above its level two years earlier; in 1974:3, 6.47%-points above; and in 1979:9, 10.72%-points above.



Last come the three "financial crisis" loosening cycles. As in the "Eisenhower" episodes, the Federal Reserve started in a neutral posture—it was not already engaged in a tightening episode when the unemployment rate starts to rise. In 1990:3 the Fed funds rate was -0.01%-points relative to its level of two years before; in 2000:9 it was at +0.50%-points; and in 2007:7 it was at -0.35%-points.

In the "murder" episodes the Federal Reserve was relatively loathe to loosen as the unemployment rate rose: the track that the economy followed lay on the upper left edge of the observed post-Korean War scatter. In the "Eisenhower" episodes the Federal Reserve loosened by relatively little, trusting in the equilibrium restoring self-stabilizing properties of the economy. But in the "financial crisis" episodes the Federal Reserve loosens aggressively, by more than a standard Taylor Rule would expect—until, that is, the end of 2008.



That is when the economy hits the zero lower bound. That by itself creates a substantial difference between monetary policy in this episode and monetary policy in a typical post-Korean War cycle, and an even more substantial difference between the amount of monetary easing as measured by interest rate changes in this episode and that seen in the other two "financial crisis" episodes.

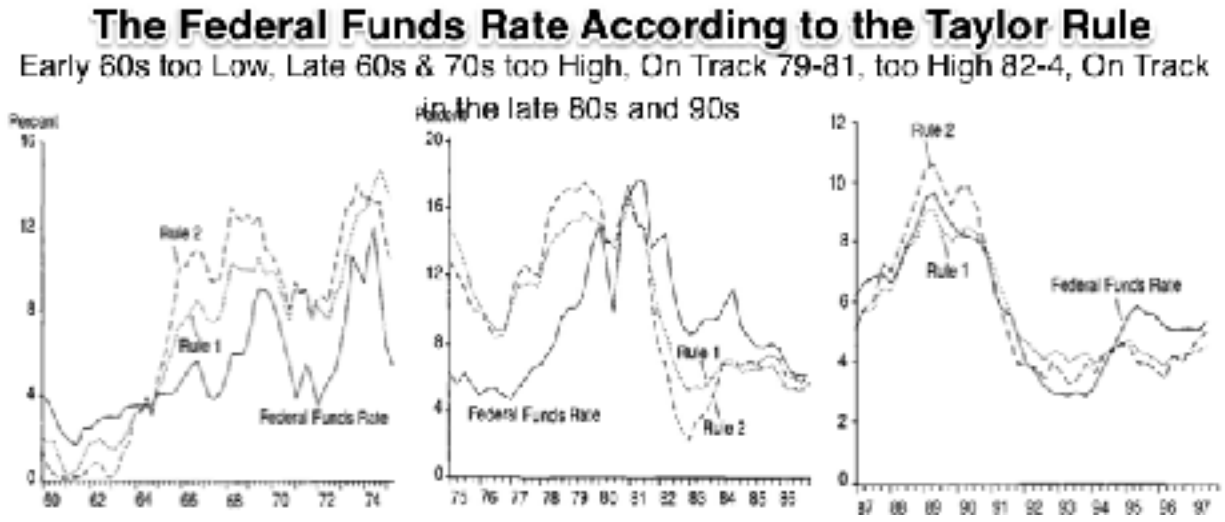
How much difference did the zero lower bound make in and since 2008?

The consensus for interest rate policy as an aspect of monetary policy back in 2007 was some version of Taylor's (1993, 1999) interest rate rule (cf. also: Henderson and McKibbin (1993)): the first in time of Taylor's two contributions to our thinking about stabilization policy that have shaped economists' thinking about the areas that are the subject of this essay more powerfully, perhaps, than contributions by any other living economist. The basic idea is that good monetary policy should follow—and that in some eras in which policy has been relatively successful monetary policy has followed—closely upon a simple interest rate feedback rule according to which the Federal Reserve sets the short-term safe real interest rate in responses to differences of actual inflation from its target rate, differences of actual GDP from potential, (perhaps) the level the underlying Wicksellian neutral real interest rate, and the level of the inflation target (Higgins (2016)).

Taylor (1999) presents two versions of his rule. In the first, Rule #1, each 1% of GDP gap vis-a-vis economic potential induces an 0.5%-point shift in the target interest rate. In the second, Rule #2, each 1% of GDP gap vis-a-vis economic potential induces a 1.0% shift in the target interest rate: the policy rule reacts more strongly to both booms and busts. In both versions, each 1% of difference between actual and target inflation induces an offsetting 0.5%-point shift in the real, and thus a 1.5%-point shift in the nominal, short term safe interest rate dictated by the policy rule.

It is fair to say that this approach took the macroeconomic policymaking community, at least here in the United States, by storm. Within three years after the publication of Taylor (1993), some of the most senior policymakers in the Federal Reserve system were noting how the Taylor Rule was extraordinarily helpful and was providing essential intellectual discipline to the FOMC's discussions.

Taylor (1999) used this framework to describe and assess monetary policy since the early 1960s. In his view then, it made little difference whether one took the rule in its more aggressive or less aggressive variant in its responsiveness to the output gap. With the exception of the unemployment rate peak at the nadir of the Volcker disinflation itself, output gaps had not been large enough and certainly not persistent enough to cause the two versions of the rule to produce significantly different policy recommendations.



By this yardstick Taylor found that monetary policy in the early 1960s had been too tight; in the late 1960s and through the 1970s too loose; "on track" over 1979-81 and 1985-1997; and too tight over 1982-84. The magnitudes of these deviations of actual policy from what the Taylor rule recommended were, however, of wildly varying sizes. The "too tight" policies of the early 1960s generated 12%-point-years of cumulative excess monetary tightness. The "too loose" policies from 1965-1978 generated 65%-point-years of cumulative excess monetary looseness. (And, indeed, over that era expectations of future inflation went from roughly 3% to roughly 10%.) The "too tight" policies of 1982-4 generated 10%-point-years of cumulative excess monetary tightness; and deviations of actual interest rates from those projected by the Taylor Rule over 1985-1997 were, in Taylor's (1999) estimation, too small to matter.

One might therefore presume that assessing how different standard interest rate-based monetary policy has been in this most recent downturn and recovery would be straightforward: Take the Taylor Rule. Assess by how many cumulative percentage-point-years short-term safe nominal interest rates have deviated from the Taylor Rule value as a result of the zero lower bound. And you are done.

The difficulties are more than threefold:

- First, the rise in the unemployment rate in 2008-9 and its high value thereafter mean that, for the first time, the gearing between the output gap and unemployment rate on the one hand the the short-term safe interest rate on the other really matters: one's view of what was following the policy rule varies significantly depending on whether one's preferred policy rule as the gearing of Rule #1 or Rule #2 in Taylor (1999).

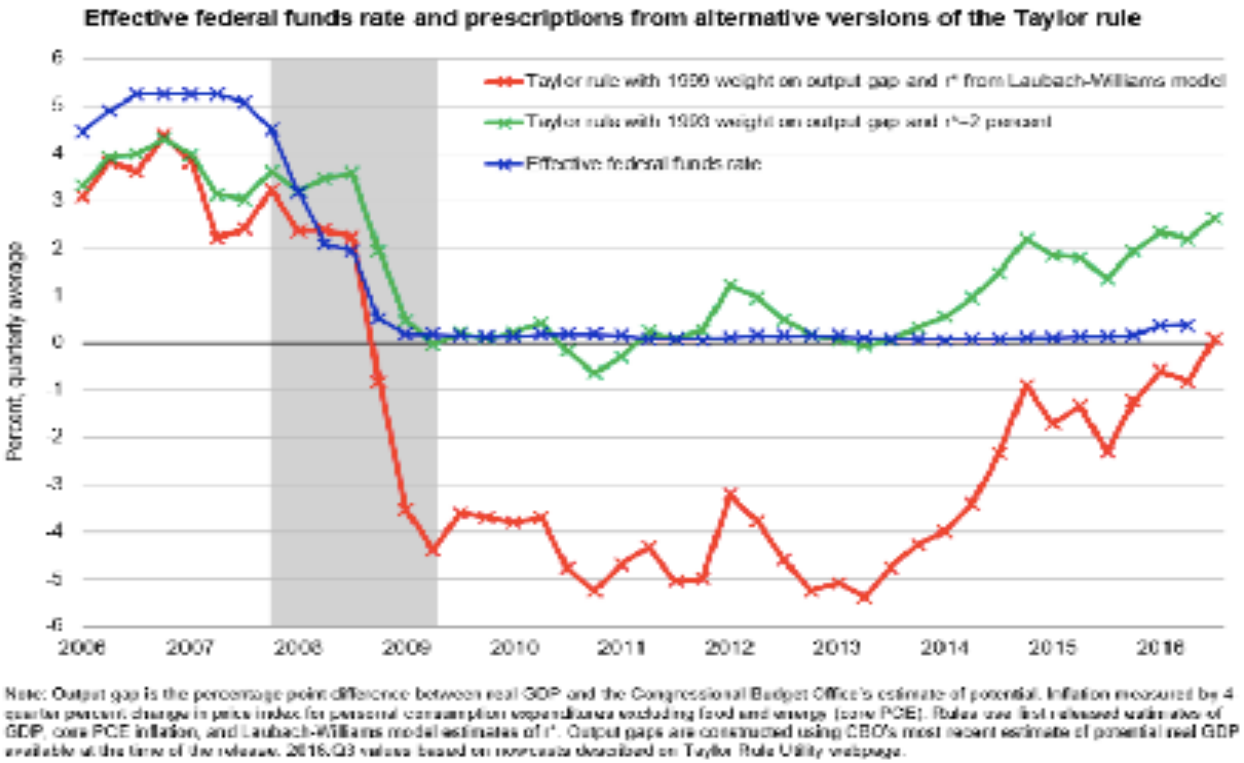
- Second, the early 2000s see the appearance of what Bernanke (2005) characterized as the "global savings glut", and what appears to be a consequent secular fall in the Wicksellian neutral safe real interest rate. Did the policy rule we were following back before 2008 implicitly include a one-for-one adjustment for shifts in the Wicksellian neutral rate as estimated along the lines of Laubach and Williams (2003)? Tastes and views differ.

- Third, there is no reason to believe that the coefficients of the true policy rule as it stood before 2008 were linear—that there were no cross-terms by which the appropriate response to an unemployment rate rise in terms of percentage-point reductions in interest rates varied depending on whether the Federal Reserve was in inflation-reduction or full-employment mode. There is not enough data to estimate such cross terms, even though the scatter-plot differences between "murder" and "financial crisis" episodes suggest that there might be. And whether or not policymakers act as if there are or are not such terms, they do not think that way.

- Fourth, we have not yet noted the knotty question of whether the unemployment rate remains a sufficient statistic for the state of the labor market, let alone for the output gap, after 2000.

These difficulties matter. Depending on whether one takes Taylor (1999) Rule #1 or Taylor (1999) Rule #2 adjusted for Laubach-Williams (2005), one sees either 5%-point-years or 2%-point-years of excess looseness over 2002-2006. And Higgins (2016) calculates that, depending on whether one follows Taylor Rule #1 or Taylor Rule #2 adjusted for Laubach-Williams (2003), either one sees interest rate policy from 2008-12 roughly following Taylor Rule recommendations and then 4%-point-years of excess looseness since 2013; or one sees 40%-point-years of excess tightness induced by the zero lower bound between 2008 and the present —excess tightness that is only now dissipating. How one comes down on whether interest rate policy has or has not been sharply constrained since 2008 and thus made monetary policy in this recovery very different from previous patterns.

But there is more to monetary policy than just interest rate policy constrained by the zero lower bound. There had been substantial thought back before 2008 about what to do at the zero lower bound. It is not that economists had a consensus on what the policy rule was, or would be. But there were definite points of view as to what the policy rule at the zero lower bound should be.



Note: Output gap is the percentage point difference between real GDP and the Congressional Budget Office's estimate of potential. Inflation measured by 4 quarter percent change in price index for personal consumption expenditures excluding food and energy (core PCE). Rules use first released estimates of GDP, core PCE inflation, and Laubach-Williams model estimates of r*. Output gaps are constructed using CBO's most recent estimate of potential real GDP available at the time of the release. 2016:Q3 values based on forecasts described on Taylor Rule Utility webpage.

I count six different currents of thought about what monetary policy would, or ought, to do were the economy to hit the zero lower bound in a serious way?

1. Don't hit the zero lower bound Keep the inflation target higher than 2%—not much lower than 5%—so that there is always plenty of room to make short-term real safe interest rates negative via standard open market operation interest rate policy when that is needed, because it will be (DeLong and Summers (1992)).
2. We won't hit the zero lower bound in a significant way. Shocks to the North Atlantic economies are unlikely to be that large (Reifschneider and Williams (1999)).
3. Keep expanding the money supply by buying bonds for cash—eventually cash burns a hole in people's pockets, and so expansionary open market operations are not qualitatively different at the zero lower bound (Friedman (1997)).
4. Open market operations are qualitatively different at the zero lower bound—they work through different and weaker channels—but by arbitrage they must work, as shown by the last-resort thought experiment of "helicopter money" (Bernanke (2000)).

5. A flex-price full employment economy preserves full employment at the zero lower bound by generating future inflation. A central bank needs to do the same thing: make credible promises to be irresponsible in the future in order to deliver that inflation (Krugman (1998)).
6. At the zero lower bound monetary policy no longer has the power to stabilize the economy: fiscal policy needs to be brought back in.

To the extent that I had views about what the implicit policy rule was that we were following back in 2008 they were roughly this: It would have been nice to follow (1) or if (2) were true, but we hadn't and it wasn't. However, any shock large enough to cause a lengthy excursion to the zero lower bound would generate a New Deal-like response. In the New Deal, Roosevelt had tried everything that might make sense and some things that could never have made sense, and reinforced success. The same, I thought back in 2008, would be true for us. A large enough shock would be followed by conventional expansionary fiscal policy, helicopter money, quantitative easing of a previously unimagined magnitude, and forward guidance and attempts to make credible commitments to carry nominal GDP back to its pre-2008 forecast path. And whichever of those seemed to be working would be reinforced, and strengthened.

Now in the world in which we live, and however much some of us wish it would come back on, (6) is off the table. (1) is off the table as well. And (2) is no longer relevant. We can argue why (1) and (6) are off the table and why (2) turned out to be wrong. These questions still greatly puzzle me. But we will reach no conclusions. And we will still have(3), (4), and (5) to assess.

Milton Friedman's (3) is, at bottom, his belief that there are reasonably-tight limits on the possible values for the velocity of money. There is, Friedman thought, a sense in which money is a very special commodity that burns a hole in people's pockets. They will spend it, if you print enough of it, and get it into people's hands by any means—in fact, the means by which you get it into people's hands does not matter much. The government can buy useful things with it. The central bank can buy bonds with it. You can drop it from helicopters. Because the interest elasticity of money demand never becomes infinite, open market operations never lose their power, even at the zero lower bound. As is written in Friedman (1997), at the zero lower bound:

> The Bank of Japan can buy government bonds on the open market. Most of the proceeds will end up in commercial banks, adding to their reserves and enabling them to expand…loans and open-market purchases. But whether they do so or not, the money supply will increase…. Higher money supply growth would have the same effect as always. After a year or so, the economy will expand more rapidly; output will grow, and after another delay, inflation will increase moderately…

Ben Bernanke's (4) rejects Friedman's monetarist fundamentalist belief that the quantity of money by itself is (close to being) a sufficient statistic for the effect of asset prices and quantities on spending. Bernanke sees that at the zero lower bound a conventional open market operation is simply the swap of one zero-yielding government asset for another zero-yielding government asset in an environment in which the liquid spendability of cash has no value at the margin. Yet he rejects the claim that monetary policy is then impotent. Bernanke (2000):

> Contrary to the claims of at least some Japanese central bankers, monetary policy is far from impotent today in Japan…

Why is it not impotent? Because of:

> what amounts to an arbitrage argument —-the most convincing type of argument in an economic context…. The monetary authorities can issue as much money as they like. Hence, if the price level were truly independent of money issuance, then the monetary authorities could use the money they create to acquire indefinite quantities of goods and assets. This is manifestly impossible in equilibrium. Therefore money issuance must ultimately raise the price level, even if nominal interest rates are bounded at zero. This is an elementary argument, but… quite corrosive of claims of monetary impotence…

In Bernanke's arbitrage thought experiment the central bank is not just swapping one zero yielding government asset for another. If it were, the argument would not go through: the government could issue an indefinite amount of cash and acquire an indefinite amount of zero-yielding assets as the mirror to a private-sector balance sheet that has an indefinite amount of cash balanced by being short an indefinite amount of government discount bonds value at par, and the price level would not change. What makes the arbitrage argument work is the word *goods*. The government prints money, and buys roads, bridges, the bearing of duration risk, biomedical research, human capital for twelve-year olds—whatever. This is helicopter money.

But the price level is independent of money issuance if one raise the money supply via open market operations and the marginal dollar of cash is held as a savings vehicle…

Paul Krugman's (5) follows a different line of argument. Krugman (1998) starts by asking what happens when a flex-price full-employment economy finds itself with a Wicksellian real neutral rate below the inflation rate and so hits the zero lower bound. The answer is one of those things that is obscure before but obvious after the fact: the real interest rate must be at its equilibrium value; the real interest rate is the nominal interest rate minus the inflation rate; the nominal interest rate is zero and cannot drop; so the inflation rate must jump up. How can the inflation rate jump up? The price level must jump instantaneously down now so that inflation can be higher in the future and the economy be on the full employment path:

> In a flexible price economy, the necessity of a negative real interest rate does not cause unemployment…. The economy deflates now in order to provide inflation later…. If the… nominal rate is zero, but the real rate needs to be negative, P falls below P*…. This fall in the price level occurs regardless of the current money supply, because any excess money will simply be hoarded, rather than added to spending. At this point one has a version of the liquidity trap: money becomes irrelevant at the margin…

Now move from a flex-price economy that automatically obeys Say's Law to a sticky-price economy that does not, but that has a central bank with the job of manipulating prices to make Say's Law true in practice even though it is false in theory. The central bank does this by manipulating its control variables to make the key prices and quantities—the real wage level, the real interest rate, etc.—equal to what they would automatically be in the full employment flex-price economy so that economic agents make full employment-attaining decisions in spite of the stickinesses and the rigidities.

In the case of the zero lower bound, the flex-price economy automatically generates the future inflation it needs to drive the real interest rate to its Wicksellian neutral level. A central bank that wishes to set prices to mimic their flex price-economy values needs to artificially generate the same future inflation. And this is the source of Krugman's observation that the job of the central bank is to make a credible promise to behave irresponsibly in the future—to generate in the future the inflation the economy needs to foresee now, even though when that future comes the equilibrium in which that inflation is generated will no longer be subgame-perfect. It is the mirror image of Kydland-Prescott: instead of a government that values employment getting into trouble by being unable to commit to keeping inflation low, a central bank that values price stability can get into trouble by being unable to commit to keeping inflation high.

Those (3), (4), and (5)—Friedman (1997), Bernanke (2000), and Krugman (1998)—seem to me to have been the intellectually-respectable and possibly practically-applicable candidates for what our monetary policy rule at the zero lower bound was, or perhaps should have been, back in 2008. And, as I wrote above, my expectations were for a convex combination of them—and then for the reinforcement of success.

And here I, at least, see a substantial difference between the convex-combination-and-reinforcement and what the actual policy outcome has been. The Federal Reserve, under Bernanke, Kohn, Yellen, Fischer, Dudley, and company, has gone well beyond the extra mile as far as (3) is concerned. The expansion of its balance sheet and the extent of the quantitative easing it has engaged in have been financial and asset market marvels indeed. And I believe they have been effective, even if the effects have been at the low end of the range I would have thought plausible *ex ante.*

Yet the conversation about helicopter money—or "social credit", or limited amounts of money-financed government purchases or tax rebates—has not yet really been joined in a way that might move it toward implementation, in spite of all of Adair Turner's (2016) attempts to do so. The closest approach has been the considerable jawboning in committee testimony that the "headwinds" generated by fiscal policies that are positively contractionary have not contributed to the situation.

And if there is one constant in Federal Reserve communication since the end of 2008, it is that it does not anticipate, does not want, and would be, in fact, alarmed if its quantitative easing policies were to lead to what Ben Bernanke (2000) thought would be desirable at the zero lower bound: for "money issuance… [to] ultimately raise the price level, even if nominal interest rates are bounded at zero…"

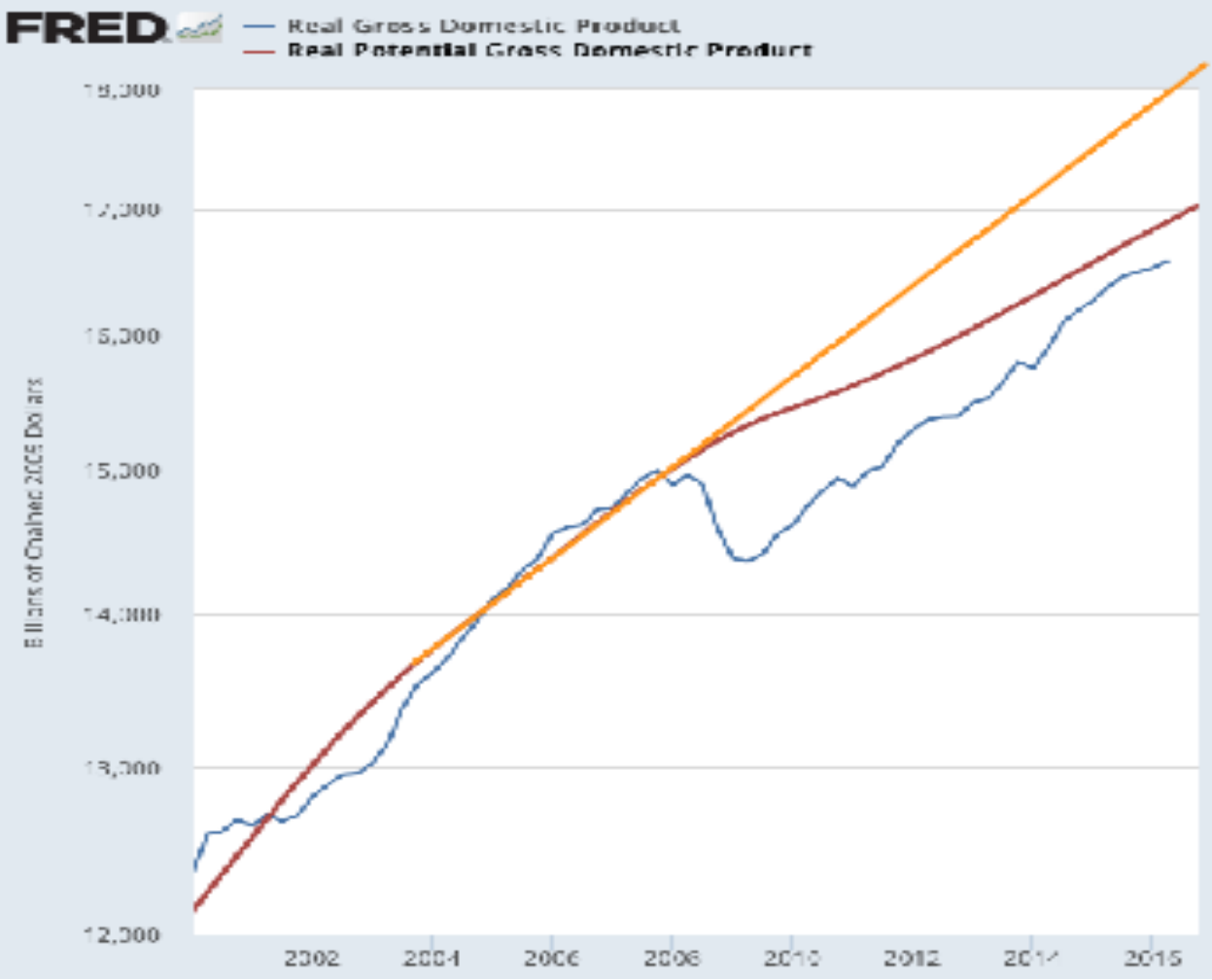
Does this focus on and willingness to go beyond the extra mile on quantitative easing but not on helicopter money or on either nominal GDP or inflation targeting make monetary policy "different" than the policy rule we thought we were following back before 2008, or than we would have thought we were following had we thought to think about what would happen on this branch of the game tree? That is, I think, a matter of taste.

Conclusion

Thus we are left where we are today. We have essentially a full recovery as far as the unemployment rate is concerned. We have a half-recovery as far as the rise-of-the-robots-corrected prime-age employment rate is concerned.

It would be very rash to say that we have confidence that the economy is near full employment right now. But it would also be very rash to have confidence that the missing prime-age workers will appear in the labor force without a very high-pressure economy indeed.

We have seen substantial convergence of output to potential. But the convergence has come about not because of output growing faster than reasonable trend, but from potential growing slower than any reasonable trend based on the growth of resources and technology, even accepting that the "new economy" of the 1990s



was a ten-year blip rather than a permanent shift.

The major lessons, in a world in which shocks like that of 2007-9 are possible, seem to me to be three:

1. If independent central banks are going to retain primary responsibility for macroeconomic stabilization, they need more and better tools in order to do the job.

2. If fiscal policy is to step up and reassume its stabilization policy role, then either fiscal institutions really need to step up their technocratic game, or some fiscal authority needs to be transferred to organizations that can play the technocratic game.

3. If we seek to rely on better prudential regulations to avoid shocks like 2007-2009, it is perhaps time to remember Hyman Minksy: Minsky pointed out that the same currents of thought that lead financiers to generate systemic risk keep regulators from being able to see and control it *ex ante.* And the very large current gap between the earnings yields of equities and the returns to safe debt would seem to argue very strongly against policies that seek to avoid macroeconomic risk by reducing market risk tolerance.

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