Should the Monetary Policy Rule Be Different in a Financial Crisis?

By Monika Piazzesi[i]

It's a pleasure to read and discuss this very nice and well-written paper by Nikolsko-Rzhevskyy, Papell and Prodan. Let me begin with a summary of what the paper does, and then discuss some of the issues that arise with monetary policy rules, especially during financial crises. These issues are important for the lessons we can draw for policy going forward.

The paper addresses the question of whether monetary policy should use rules or discretion and what are the effects of this choice. The policy rules it considers are the original Taylor Rule (Taylor (1993)) $r = 1.0 + 1.5p + 0.5y$, where r is the federal funds rate, p is the inflation rate and y is the output gap, and a modified version of the Taylor Rule that increases the output gap coefficient from 0.5 to 1. The paper defines policy rule deviations by taking the actual federal funds rate and subtracting off what the policy rule prescribes. It then does statistical tests for structural breaks in the mean of these policy deviations.

The paper finds the following empirical results: For the original Taylor Rule it finds that the sixties and early seventies were a period of low deviations, and it labels that as a rules-based era. For the early seventies until the mid-eighties it finds high deviations from the policy rule, and it calls that a more discretionary-based era. For the mid-eighties to 2000s it again finds low deviations, so we are again back to a rules-based era. And then starting in 2000, there are again large deviations, so we're back to discretion.

For the Modified Taylor Rule, instead of the original Taylor Rule, the paper finds that we are back to rules-based policy making starting in 2006. So the results are fairly consistent, they give a good picture of how policy was conducted. The question is: what were the effects of rules-based policymaking versus discretion? Here the paper examines various loss functions in output and inflation and evaluates them during the different periods of rules versus discretion. It finds higher losses in discretionary periods.

Let me comment first on what we can and cannot conclude from this analysis. One thing we can conclude is that policy deviations from these Taylor rules were large during the financial crisis, and that the statistical procedure in the paper detects structural breaks in the policy rule coefficients between the period from of the late 1970s to early 1980s and the period of the late 1980s and 1990s. We can conclude from these findings that the Fed has not been implementing the Taylor rules that the paper estimates. But we cannot conclude that the Fed did not implement *any* policy rule so that policy was not rules-based and discretionary. The deviations from the particular rules the paper is considering might reflect that the Fed is using a different policy rule, just not the original or modified Taylor rule.

Should the Fed use the Taylor rule? We know the answer to this question is basically “yes” during normal times. A large literature on optimal monetary policy has documented that the Taylor rule performs very well; it is either optimal or close to the optimal rule. This performance has been documented based on a large set of models that were evaluated with data before the financial crisis. However, the recent crisis was a period with different shocks and different frictions at work. Would the Taylor rule have improved the loss function also during this crisis? This counterfactual is not in the paper, so we don’t really know. We really need to know the answer to this counterfactual before we can jump to the conclusion that it would be good to implement the Taylor Rule always.

What do we know about optimal monetary policy during a financial crisis? John Taylor (2008) gave testimony to Congress on this topic in February 2008. He started from his original

Taylor Rule and observed that the fed funds rate in this rule is describing is an interbank lending rate. But during the financial crisis, banks default rates and risk premia for short-term borrowing went up. So interest rate spreads—such as the TED spread or the LIBOR-OIS spread—went up, and these drove the interbank rate up. At the point in time when John gave his testimony, the spreads were around 50 basis points. John argued that policy makers should take that into account. Since probably the policy rule had been based on models of the effect on the economy of an interest rate *without* such spreads, then the policy rule should not have these credit spreads in it. That would call for an adjustment in the intercept of his rule by the amount of the credit spread. His argument was: maybe the intercept should be adjusted down by 50 basis points because that is what credit spreads were at that time.

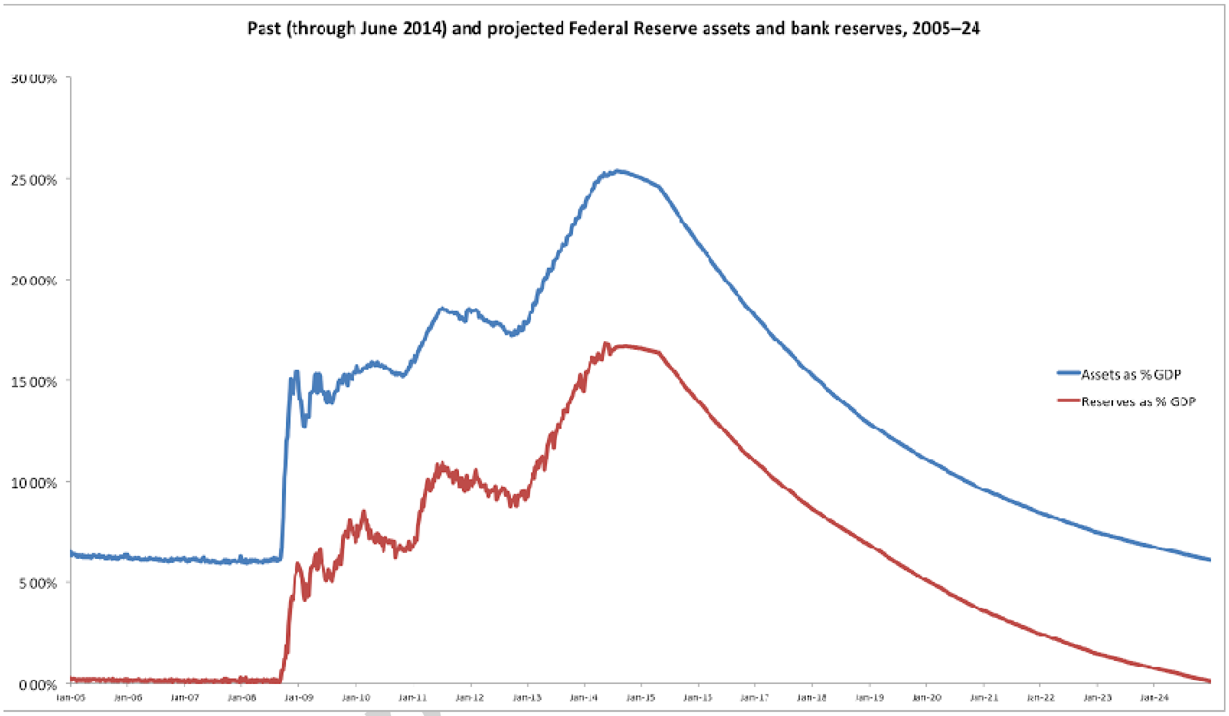
More recently, several papers have started to address the question about optimal policy during a financial crisis. It turns out that the answer depends a lot on the details of the model that is being used. If the model has a representative agent and the loss function is a second order approximation of the agent's utility, and the model has only one state variable (for example, banks produce output and their net worth is this state variable), then optimal policy may still be formulated as a Taylor Rule.

The Taylor rule may still be optimal in much richer models with heterogeneous agents. The key is whether these models have many state variables. For example, Curdia and Woodford (2010) study the conditions under which Taylor Rules would still be optimal in a model in which agents receive preference shocks that make them differ in their relative impatience to consume and their marginal disutility of working. They find is that in periods when financial shocks are important and frictions are really strong, then policy might want to respond to credit spreads, as John Taylor was suggesting in his 2008 testimony. Their calibrated model suggests that the coefficient by which policy makers should adjust the intercept in the Taylor Rule is smaller than 1. So you wouldn't subtract off the entire credit spread, but you would still react to that spread. Other papers find that monetary policy should respond to other variables –credit growth, for example—as in the model by Christiano, Ilut, Motto and Rostagno (2007)

Since the financial crisis, we have witnessed a new era of monetary policy with a lot of unconventional policies. I think the original justification for these policies was that if you take a model in which banks' balance sheets matter, it makes sense in a period where those balance sheets were really hit—say because of a housing collapse where banks were holding a lot of mortgages and mortgage-backed securities—for the Fed to stabilize these markets and buy mortgage-backed securities. The question then becomes, how large should those operations be?

Consider Figure 1 which is drawn from a recent paper by Gagnon and Sacks (2014). It shows historical data on assets and reserves on the Fed's balance sheet, and projects these into the future based on statements by the Fed about how they're going to wind down these assets. The GDP projections, which are from the Blue Chip forecasts, are used to express these balance sheet items as a percent of GDP.[ii] Right now the balance sheet is about .25 times GDP or about $4 trillion.

What is particularly interesting about the projections is that the Fed is going to have a very large balance sheet for the foreseeable future. We are going to have to think about what this means for the working of monetary policy, which is what John Cochrane does in his paper in this volume. It will be particularly important to understand the redistributive effects of these policies. If the Fed is paying interest on reserves and those interest rates are higher than equilibrium interest rates, then the Fed will be redistributing funds from non-banks to banks. This is going to be a big issue that monetary policy will have to deal with going forward.


Past (through June 2014) and projected Federal Reserve assets and bank reserves, 2005–24
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
Jan-24
Assets as % GDP
Reserves as % GDP

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Corresponding Author: Prof. Monika Piazzesi,

Corresponding Author's Institution: Stanford University

First Author: Monika Piazzesi

Order of Authors: Monika Piazzesi

Abstract: This article reviews the finding that standard loss functions in output and inflation are higher during discretionary periods than in periods during which monetary policy is described by a rule, such as the Taylor rule. It shows that the finding is consistent with earlier research, but argues that we really do not know if the Taylor rule would have improved performance during the recent financial crisis. The article then considers modifications of policy rules to deal with changes in interest rate spreads, credit aggregates and banks' balance sheets.

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[i] I thank David Mauler for his excellent assistance.

[ii] Following Gagnon and Sachs (2014) this figure is based on Federal Reserve balance sheet data obtained from the Federal Reserve Board. It includes in reserves the increase in reverse repurchase agreements after August 2013. Projections of total assets are calculated by assuming the Federal Open Market Committee (FOMC) continues its current pace of reducing purchases each meeting, ending them by the end of 2014. It then assumes that the Fed's balance sheet is maintained at a constant nominal size until May 2015, whereupon the Fed begins to allow assets to decrease (through redemption) by 12 percent per year through 2018. It assumes a rate of 10 percent for 2019-2020, a rate of 8 percent for 2021-2022, and a rate of 6 percent thereafter. The difference between assets and reserves is assumed to linearly return to its pre-2008 level of 6 percent of GDP by the end of 2018. Finally, the nominal GDP projection uses the CBO's 2014 ten-year forecast.