

**Discussant's Comments on James Hamilton's
"Perspectives on U.S. Monetary Policy Tools and Instruments"**

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Monetary Policy Implementation: Macro and Micro Questions

James Hamilton's conference paper does an excellent job of describing how the Federal Reserve currently implements its federal funds rate targeting strategy by manipulating the interest rate it pays on its own liabilities – reserves issued to banks and reverse repurchase agreements with non-bank financial institutions – as well as the size of its balance sheet. His paper usefully compares the implementation procedures used today with those employed in the past and proposes changes to make the new procedures more effective in the future.

Since the paper's descriptions of the Fed's operating procedures and their effects on financial markets are so clear and informative, they require few additions or improvements. Thus, these comments are directed instead at answering three broader questions that the paper's analysis raises. First, at the macroeconomic level, what do the details of the Fed's current implementation procedures have to do with monetary policy? Very little, it turns out. Instead, these procedures appear to be directed more specifically at eliminating high-frequency volatility in short-term nominal interest rates, that is, at interest rate smoothing.

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Answering this first question therefore leads to two more. What macroeconomic or microeconomic concerns make it desirable for the Fed to smooth interest rates in this way? And what microeconomic modifications to the current operating procedures would allow the Fed to smooth interest rates more efficiently in the future?

What is “Monetary Policy?”

Monetary policy can be defined most clearly with reference to two basic macroeconomic principles: the classical dichotomy, which draws the distinction between real and nominal variables, and the doctrine of long-run monetary neutrality, which assigns to monetary policy the principal task of determining the behavior of the aggregate nominal price level.

In a capitalist system, prices play a key role in allocating scarce resources. Specifically, prices adjust to keep in balance the supply of and demand for individual goods and services, thereby allowing real variables – physical quantities of those same goods and services – to respond efficiently to all kinds of shocks.

The prices that play this resource-allocating role, however, are relative prices. Therefore, some additional institutional arrangement must be imposed to pin down the absolute level of prices and to determine, by extension, the behavior of nominal variables: those denominated in the economy’s unit of account.

Under our fiat money system, this institutional arrangement is embodied by the Federal Reserve. It is up to the Fed to conduct monetary policy in a way that pins down the aggregate nominal price level. The Fed achieves this goal by exercising its monopoly control over the supply of base money: currency plus bank reserves.

Today, as before the crisis, the Fed implements monetary policy by targeting the federal funds rate. The federal funds rate, however, is a market rate of interest, charged by one bank to another on a very short-term loan of reserves. The Fed does not set the funds rate directly. Instead, the Fed's operating procedures must link the federal funds rate, which the Fed can only influence, to the monetary base, which the Fed can precisely control.

Before the financial crisis of 2007-08, the link between the funds rate and the supply of base money was more immediate and therefore more obvious. Whenever the Fed wanted to lower its target for the funds rate, it conducted an open market purchase, buying U.S. Treasury securities to inject new reserves into the banking system. The increased supply of bank reserves put downward pressure on the equilibrium funds rate, moving it lower in line with the new target. Conversely, whenever the Fed wanted to raise its target for the funds rate, it conducted an open market sale of U.S. Treasury securities to drain reserves from the banking system and put upward pressure on the funds rate.

Since December 2015, however, the Fed has gradually lifted its federal funds rate target off its zero lower bound using a floor system. Under this floor system, the Fed uses its newly-granted ability to pay interest on reserves to manipulate the federal funds rate, without having to conduct open market operations right away. By raising the interest rates paid to banks on reserves and non-bank financial intermediaries on reserve repurchase agreements, the Fed has successfully moved the federal funds rate up in lockstep. And, presumably, when the next easing cycle begins, the Fed will lower the interest rates on reserves and reverse repurchase agreements to bring the federal funds rate back down.

Even under a floor system, however, all monetary policy actions taken to influence the trajectory for the aggregate nominal price level must be supported, sooner or later, by open

market operations that change the supply of base money. Although the floor system relieves the Trading Desk at the Federal Reserve Bank of New York from having to actively manage the supply of reserves on a day-to-day basis, it still implies that the Fed accomplishes its principal macroeconomic function – pinning down the aggregate nominal price level – by exercising its control over the supply of base money.

A simple thought experiment illustrates why this must be true.¹ Suppose, first, that the market for reserves begins in a long-run equilibrium, in which the Fed is satisfied with the dollar volume of reserves it has supplied to the banking system and banks, in turn, are happy to hold the same dollar volume of reserves supplied. Suppose, next, that starting from this initial equilibrium, nominal GDP grows at an average annual rate of 5 percent.

Looking ahead, five years beyond the initial equilibrium point, 5 percent annual growth translates, after allowing for compounding, into an increase in the level of nominal GDP of more than 25 percent. Thus, if the Fed uses a floor system to target the federal funds rate over this five-year period without ever conducting an open market operation, it is easy to see that the initial equilibrium will be severely disturbed. Banks will not want to hold the same dollar volume of reserves, when the nominal size of the economy is more than 25 percent larger! This thought experiment confirms that, indeed, over the five-year period, the Fed will still have to conduct open market operations to allow the monetary base to grow at approximately the same 5 percent annual rate as nominal GDP.

¹ Ireland (2014, 2017, 2019a) presents richer and more realistic examples of how, even under a floor system, the Fed must continue using open market operations to bring about changes in the supply of base money that support desired changes in the aggregate nominal price level.

Many economists would prefer to describe the chain of events that unfold in this story in a different way. They would point to the Federal Open Market Committee's (2019*a*, 2019*b*) own policy statements to re-emphasize that the Fed now uses a floor system to target the funds rate, and that the Fed's monetary policy strategy is to target the funds rate in order to achieve its statutory dual mandate for price stability and maximum sustainable employment. From this more popular perspective, the open market operations that appear in the thought experiment appear as technical details, necessary only to accommodate the increased demand for currency and bank reserves that reflects the slow but steady growth of the U.S. economy as a whole.

This popular view of the Fed's operation procedures and policy strategies is not inaccurate or incorrect. But it remains incomplete in one key respect and, as a consequence, risks confusing cause and effect. This is because it fails explain why nominal GDP would be growing at a 5 percent annual rate in the first place. It totally ignores the fact that nominal GDP is growing because everyone expects the Fed to conduct monetary policy in a way that allows for the same slow but steady growth in the stock of base money!

From the viewpoint of macroeconomic theory, therefore, open market operations remain a critical part of the Fed's implementation procedures. Managing the monetary base to determine the behavior of the aggregate nominal price level still constitutes the clearest and most accurate description of the Fed's monetary policy strategy. From this perspective, it is the floor system that appears as the set of technical details, intended to accomplish something else: to clamp down on what would otherwise be high-frequency fluctuations in short-term nominal interest rates. This raises the next question: why would the Fed want to smooth interest rates in this way?

Why Smooth Interest Rates?

There are, in fact, both macroeconomic and microeconomic reasons why the Fed might wish to adopt operating procedures that minimize short-term fluctuations in interest rates even as it also manages the monetary base to ensure price-level stability in the long run.

From a macroeconomic perspective, Poole (1970) shows that in a Keynesian model, which describes events over a time frame short enough to take the aggregate nominal price level as fixed, nominal interest rate instability may create real instability. To assess the relevance of this result to issues relating to the design of the Fed's floor system, however, one must decide first on an interpretation of "the interest rate" in Poole's model. Does Poole's result imply only that the Fed should aim to stabilize the federal funds rate, on average, around a constant target over each six-week period between Federal Open Committee Meetings? Or does his result also mean that the Fed should strive to eliminate even daily fluctuations in the funds rate? Only in the latter case would the Fed's new floor system offer advantages over the more traditional procedures used before the financial crisis.

Microeconomic arguments, therefore, provide more compelling support for interest rate smoothing of the kind the Fed wishes to pursue. Under our fiat money system, liquidity can be created by the Fed at constant, zero marginal cost. Therefore, economic efficiency dictates that the opportunity cost that households, businesses, and financial institutions incur when they hold stocks of liquid assets should remain low and stable as well. This can be accomplished, partly by paying interest on bank reserves as advocated by Tolley (1957) and Friedman (1960), but also by keeping market rates of interest rates low and stable, as prescribed by Friedman (1969).²

² Plosser (2017) describes how interest on reserves, as used by the Federal Reserve to maintain an exceptionally large balance sheet even after the financial crisis and Great Recession of 2007-09, exposes the Fed to a myriad of economic and political risks. For many of the same reasons

Professional funds managers, in particular, should be directing the bulk of their time and effort towards identifying the most productive investment projects that provide the highest private and social rates of return, not gambling on day-by-day movements in money market rates. Thus, these microeconomic efficiency arguments provide good reason for the Fed to smooth interest rates, even at very high frequencies.

How to Smooth Interest Rates More Efficiently?

In theory, the idealized corridor or floor systems described in Hamilton's paper should make it easy for the Fed to do all three of these things at once: manage the stock of base money to stabilize the aggregate nominal price level, target the federal funds rate so as to achieve the Fed's stabilization objectives for the real economy, and eliminate high-frequency interest rate volatility that leads to socially wasteful but privately lucrative trading activity in the money markets. Moreover, these systems have the advantage of using market mechanisms to achieve automatic smoothing of short-term interest rates without daily intervention from the Trading Desk.

In a corridor system, the Fed's discount rate, at which it stands ready to lend reserves to the banking system, sets a ceiling above which the federal funds rate will not rise. This is because if, to the contrary, the funds rate was to exceed the discount rate, any bank could borrow at the discount window, lend the funds out in the interbank market, and thereby book instantaneous profits. Excess supply of loans in the interbank market would then push the funds rate back below the discount rate.

cited by Plosser, Ireland (2019b) argues that microeconomic efficiency in the markets for currency, bank reserves, and other liquid assets would be maintained better through Friedman's (1969) proposal for low and stable market rates of interest than through Friedman's (1960) proposal for paying interest on reserves.

Similarly, in either a corridor or a floor system, the interest rate that the Fed pays on bank reserves sets the floor below which the federal funds rate will not fall. If, to the contrary, the funds rate was to drop below the interest rate on reserves, then any bank could borrow funds in the interbank market, deposit the funds in its account at the Fed, and again book instantaneous profits. Excess demand for loans in the interbank market would then drive the funds rate back above the interest rate on reserves.

Hamilton's paper usefully notes, however, that historically, the discount rate hasn't always set a ceiling for the federal rate and, more recently, the interest rate on reserves has not set the floor. As his paper explains, regulatory and institutional constraints have often prevented banks and other financial institutions from exploiting the arbitrage opportunities as required to make the system work.

Again, microeconomic concerns loom largest. Unexploited arbitrage opportunities – just a fancy term describing specific deviations from what more generally would be called “the law of one price” – are almost always a sign of microeconomic inefficiency. They mean that different economic agents face budget constraints with different slopes. Marginal rates of substitution and transformation will then differ across agents as well, implying that there are gains from trade that would make everyone better off but have gone unrealized.

The most useful and important message of Hamilton's paper is exactly this. If Federal Reserve policymakers really wish to smooth interest rates, they should clean up their floor system. Less encumbered by formal and informal regulatory constraints and institutional complications, an ideal corridor or floor system lets freely-functioning financial markets automatically smooth out high-frequency movements in short-term interest rates. Relieved from task of intervening daily in those financial markets, Federal Reserve officials can then focus on

their more basic macroeconomic objective of creating and maintaining an environment of aggregate price stability. Within this most favorable monetary environment, our capitalist system can do what it does best: delivering robust and sustainable long-run growth in real incomes and jobs for all Americans.

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