

THE MICROECONOMIC PERILS OF MONETARY POLICY EXPERIMENTS

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The Federal Reserve (Fed) tells us that its experiments in quantitative easing (QE) are stimulating the economy, and financial news services obediently echo that message. But there is reason to believe that, under current unusual market conditions—especially near-zero interest rates and tightening prudential regulatory requirements—Fed actions may be having little effect, or even effects opposite to those the Fed intends. Because of changes in how the tools of the Fed work under the current unusual circumstances, raising interest rates and shrinking the Fed’s balance sheet have little effect, or even a positive effect, on economic activity. That is especially true when one adopts an appropriate medium-term perspective on monetary policy and takes into account the benefits of avoiding the destabilizing potential consequences for asset markets of the Fed’s current mortgage-backed securities (MBS) purchases.

The argument for raising interest rates at this time, however, is not mainly one about incremental accommodating or tightening; rather, it is about restoring predictability to monetary policy by reviving the federal funds market. It is essential to return to a situation where

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(based on decades of empirical evidence) the Fed can use changes in the federal funds rate as its policy tool and confidently project whether its incremental policy actions are stimulative or contractionary. We should not continue under the current unusual circumstances, in which the Fed and the markets cannot tell whether incremental actions by the Fed constitute stepping on the gas pedal or the brake.

I propose a modest 2 percentage point increase in the federal funds rate, along with other measures that on balance would probably have little immediate effect on the economy. Those actions, however, would ensure a speedy return to a normal policy environment—where bank reserves are once again “scarce,” where the federal funds rate takes on its traditional usefulness as a gauge of monetary policy, and where Fed actions would have much more predictable consequences.

Background

Monetary policy affects the economy through a variety of “transmission mechanisms.” For example, when the central bank expands its balance sheet through securities purchases, there is an increase in “high-powered money” and reserve holdings of banks at the central bank. If commercial banks maintain a constant fraction of their deposits as reserves, the central bank’s expansion of securities purchases will create an expansion of bank deposits, which are used to fund bank assets such as loans. This process of deposit and loan expansion that may result from central bank securities purchases operates through what is sometimes called the “loan-supply” transmission mechanism of monetary policy.

Loan-supply changes are only one of the ways monetary policy affects the economy. Purchases of securities affect the economy through channels other than the expansion of the supply of bank loans, such as changes in market interest rates. If the central bank is targeting a particular class of assets in its purchases, the consequent subsidy the Fed is providing to some assets (through its willingness to absorb risks related to the term structure or the mortgage market) may also affect the relative prices of securities. Recent MBS purchases by the Fed, or long-term Treasury purchases, are best seen as a form of fiscal—not monetary—policy, which subsidizes certain risks and thereby favors certain investments. For example, Fed

purchases may have important effects on the MBS spread over Treasuries or on the term structure of Treasuries, which may affect investment in housing.

Because exchange rates reflect the forward-looking value of the dollar relative to other currencies, changes in the current or prospective supply of dollars (controlled via the Federal Reserve's ultimate monopoly over the supply of high-powered money) via securities purchases, or other actions or statements by the Federal Reserve, also can affect exchange rates, which in turn influence the supply and demand for exports, imports, and international capital flows.

Further complicating the analysis of monetary policy effects are the numerous tools the central bank can employ to influence markets through each of these channels. The Federal Reserve's purchases and sales of securities are one tool, but the Fed also sets its discount rate (through which it lends funds to member banks), varies its reserve requirement (which can influence the extent to which an expansion of high-powered money results in changes in deposits and loans), determines the interest on reserves (higher interest reduces bank loan supply by encouraging the accumulation of excess reserves), and promulgates regulations that affect banks and other intermediaries' abilities to supply loans and deposits or engage in repurchases (repos). For example, with respect to regulatory influences, when the Fed recently increased bank capital requirements by setting a "Supplementary Leverage Requirement," which required repos to be included in the definition of bank leverage for some banks, the market supply of repos decreased (Allahrakha, Cetina, and Munyan 2016).

Apart from all of those current actions, the Federal Reserve can also influence markets by issuing "forward guidance" about its future intentions with respect to any of those actions, either through speeches or explicit forecasts of the future path of interest rates and other key variables that it can influence.

During some periods (e.g., from 1983 to 2001), the complexity of the monetary policy transmission mechanism did not pose major problems for predicting the influence of monetary policy. That was the case because (1) the Fed's actions were limited to targeting the federal funds rate, (2) the primary tool was open market operations, (3) the Fed's activities were confined almost exclusively to the purchase and sale of Treasury bills, (4) important regulatory policies (capital and liquidity requirements) were known and not subject to

dramatic change, and (5) the Fed seemed to be following an implicit rule that linked its federal funds target to current levels of inflation and unemployment.

In the current environment, however, it is very hard to know how to gauge the consequences of Fed actions, many of which make use of policy instruments that have not been used in the past. No empirical record exists from past Fed behavior from which to form reliable estimates of the consequences of current Fed behavior. Furthermore, these unprecedented policies are interacting with a unique economic environment (most obviously, one in which nominal interest rates have remained near zero for many years and regulatory policy is subject to constant change). The combination of a unique environment and the use of many new tools (quantitative targeting of the Fed's balance sheet, as in QE1, QE2, and QE3; Fed involvement in the repo market; Fed setting of rates of interest paid on reserves; Fed guidance statements about likely future policy), operating through many potential channels of influence, has made it almost impossible to forecast the influence of Fed policy actions on the real economy. In pointing to policy uncertainty, I am not referring to the well-known problem that the future actions of the Fed are unpredictable because of the absence of a clear policy rule (a problem that many economists have lamented for some time); rather, I am pointing out that it is very hard to know what effects even *monetary policy* actions are having on the economy today, much less what effects *Fed policy* (defined more broadly to include its fiscal policies and regulatory actions) is having on the economy.

This is not just a problem of gauging the precise magnitude of policy effects. It is a more fundamental problem in gauging even the direction of influence. Despite confident Fed pronouncements that it is helping to promote recovery, it is not at all clear that holding interest rates at their current near-zero levels, or maintaining the bloated Fed balance sheet stimulates the U.S. economy. In the medium run, because of concerns about destabilizing bubbles that Fed policy may be creating in agricultural land, housing, commercial real estate, and securities markets, an even stronger case can be made that contracting the Fed's balance sheet and raising interest rates might be expansionary. As John Taylor wrote in 2013: "The Fed's current zero interest-rate policy also creates incentives for otherwise risk-averse investors—retirees, pension funds—to take on questionable investments as they search for higher yields in an

attempt to bolster their minuscule interest income. The low rates also make it possible for banks to roll over rather than write off bad loans, locking up unproductive assets.”

My best guess is that Fed monetary policy currently is having a small effect on the economy, which is slightly contractionary (but highly uncertain in the direction of its effect). Meanwhile, Fed fiscal policy is slightly expansionary in the short run (primarily through its implied subsidy to housing finance risk) but likely contractionary in the medium run (by contributing to the possibility of a future asset price crash). Finally, Fed regulatory policy is clearly contractionary in the short and medium runs. My main point, however, is that the unprecedented tools and environment in which the tools are being applied make it hard to know the *direction* of policy effects, much less their magnitude.

My analysis of current Fed policy actions divides into five parts: (1) the consequences for loan supply of prudential regulatory tightening and the reduced market value of bank equity resulting from low interest rates, (2) repo funding cost consequences of monetary policy, (3) exchange rate consequences, (4) corporate balance sheet consequences, and (5) asset price consequences. I conclude that the Fed would likely improve the short- and medium-term growth and stability of the U.S. economy if it *raised* interest rates significantly, restored the functioning of the federal funds market, reduced its balance sheet, and withdrew from the repo market.

Bank Loan Supply, Capital Regulation, and Equity Value Consequences of Monetary Policy

Monetary economics textbooks characterize the loan-supply channel of monetary policy as follows: (1) the central bank buys securities, (2) this results in excess reserves credited to bank balance sheets, (3) banks reduce excess reserves by lending funds and increasing deposits. There is substantial empirical evidence suggesting that in the past, expansionary central bank policy (reductions in the targeted interest rate) are associated with expansions in the supply of lending and a reduction in loan spreads.

But average behavior from the past may not be very useful for predicting loan-supply effects under current circumstances. First, regulatory policy may constrain loan growth. There is ample empirical evidence that regulation has reduced the willingness of banks to

expand deposits and loans. Most obviously, the largest U.S. banks recently have turned down large corporate deposit balances (an unprecedented action) because of the regulatory costs of maintaining those deposits on their balance sheets. More generally, there is a large empirical literature showing that minimum capital ratio requirements can play an important role in constraining bank loan supply.¹ If monetary policy expansion increases banks' excess reserves but capital requirements act as a binding constraint on loan supply, banks will not expand loans and deposits as their excess reserves rise. Recent increases in minimum capital ratios and liquidity coverage imposed by the Fed have limited the ability of banks to transform their excess reserves into loans and deposits (see Allahrakha, Cetina, and Munyan 2016).

Putting aside the effects of regulatory policy (minimum book value ratio requirements and minimum liquidity book value ratio requirements), bank loan supply may be limited by anything that reduces the *market value* of bank equity. The market value of equity matters because banks' ability to operate depends on their maintaining low default risk as perceived by the market. Standard models of finance (e.g., the Black-Scholes-Merton model) characterize default risk as a function of asset risk and the market value of equity relative to assets. Given that banks target low default risk, if a shock reduces banks' market values of equity, banks must respond either by raising capital or by reducing risk (Calomiris and Wilson 2004).² Default risk reduction via loan-supply contraction is the most common bank response.

There is a strong correlation between bank equity values and loan-supply growth in recent years (Bird 2016). Furthermore, the 2008 crisis vividly illustrated how reductions in banks' equity values can raise the counterparty risk of banks enough to produce a systemic crisis as troubled banks become unable to roll over their short-term debts (Calomiris and Herring 2013).

¹See the review of the literature in Aiyar, Calomiris, and Wieladek (2015), and the recent microeconomic evidence for the United Kingdom in Aiyar, Calomiris, and Wieladek (2014a, 2014b, 2016) and Aiyar et al. (2014).

²Following the same logic, an increase in uncertainty, for a constant market value of equity ratio, will also contract bank lending. Bordo, Duca, and Koch (2016) show that uncertainty shocks in fact have that effect. Thus, uncertainty about the future path of monetary policy has been another adverse influence on loan supply.

To the extent Fed policy damages bank equity values, loan supply will contract. But how does Fed policy adversely affect the market value of bank equity? Doesn't the Fed's commitment to low interest rates reduce discount rates for corporate earnings, thereby propping up stock prices in the economy, and shouldn't that increase the market value of banks' equity?

Interestingly, in the case of bank equity, monetary policy is having the opposite effect. As Calomiris and Nissim (2014) show, once it became clear that the Fed would be maintaining very low interest rates for a protracted period of time, the market value of "core" deposit relationships changed from a positive to a negative influence on banks' cash flows and the market values of bank equity. Persistent low interest rates meant that banks were stuck with highly negative cash flows from branch leases and employee compensation, but did not reap the benefits of interest cost savings that usually result from having invested in branch networks to serve core deposit customers. Calomiris and Nissim (2014) show that this is a major contributor to the persistently low market-to-book equity ratios of U.S. bank holding companies.

Clearly, both Fed monetary policy and Fed regulatory policy independently are constraining the supply of loans. This explains why the expansion of the Fed's balance sheet has resulted in a huge persistent expansion of excess reserves rather than a substantial increase in bank lending.³

Repo Funding Costs and Loan Supply

Over the past several decades, repo has been an important alternative, off-balance sheet source of funding for lending in the U.S. economy, by both regulated banks and nonbank lenders. But, as Gorton and Muir (2016) emphasize, the massive expansion of the Fed's balance sheet over the past decade has withdrawn a large amount of low-risk collateral from the market, thereby making repo funding of loans and other financial transactions harder to arrange.

³David Malpass has written numerous op-ed articles in the *Wall Street Journal* (e.g., Malpass 2016) over the past several years arguing that the Fed has been contracting loan supply, and that monetary policy has been a contractionary influence on the economy.

Furthermore, the enactment of the supplementary leverage ratio (SLR) requirement (a policy that includes the quantity of repos in the regulatory measure of leverage, which was announced in 2012, and began to affect bank behavior at that time) has also reduced the supply of repo funding. Allahrakha, Cetina, and Munyan (2016) find that this new requirement increased the cost of repo finance by regulated U.S. institutions.

It is important to recognize that the Fed's new role as a repo counterparty (since 2013) does not offset the collateral drain produced by the Fed's accumulation of repo collateral on its balance sheet. The Fed lends its collateral into the market in exchange for cash. Because the Fed engages in triparty transactions, the repo collateral employed in Fed transactions cannot be re-hypothecated in other transactions. On net, Fed "reverse repos" drain cash from the market and do not provide collateral that can be used by other repo market participants.

The Fed's dual role as a regulator and a repo counterparty also raises important new and disturbing questions about a new conflict of interest. As a repo counterparty, the Fed benefits financially from its imposition of the SLR, which reduces its competitors' abilities to engage in similar transactions. Is it conceivable that the Fed might have taken into account its own financial benefits from being able to engage in reverse repo on more favorable terms when setting regulations for its competitors? Yes, it is. When the Fed began contemplating its reverse repo tool, it was already cognizant that it might want to engage in a large amount of such transactions. The Fed was concerned that if it failed to raise sufficient revenue from lending securities in the repo market, its expected accounting contribution to federal deficits would rise. As many observers noted, the likely financial costs to the Fed from experiencing losses in the future has potentially important adverse political implications for the Fed. Indeed, one of the reasons the Fed planned to engage in massive amounts of repo, rather than selling securities into the market, was political. Employing repos rather than selling securities allows the Fed to avoid the expected accounting consequences of recognizing capital losses from securities sales, which (under current Fed accounting rules) would increase its measured contribution to government deficits. I do not claim to know that the Fed's SLR was motivated in part by a desire to improve its competitive position in the repo market, but the coincidence in timing between the SLR and the Fed's entry into the repo market is disturbing, and there is no question that

the Fed suffers a conflict of interest from being both a repo counterparty and a regulator. That conflict adds to the preexisting list of conflicts that would be resolved by removing the Fed from its role in setting regulatory standards.

In summary, through the combination of the Fed's accumulation of Treasuries and MBS, its decision to use reverse repo rather than sales of those securities in any future tightening of monetary policy, and its SLR regulation, the Fed has been increasing, and will continue to increase, the cost of repo funding, which is another contractionary influence on the supply of lending in the economy.

Exchange Rates

At a recent conference, I reviewed the adverse consequences of Fed policies for bank equity values and repo funding costs and argued that the loan-supply consequences of Fed policy have been contractionary. I was expecting a vigorous disagreement from the representatives of the mainstream point of view, but instead a former high-ranking Federal Reserve Board economist responded that the Fed's internal model of the transmission mechanism of monetary policy agreed with my conclusion. The Federal Reserve Board model, according to him, implies that monetary policy currently is having a contractionary effect on loan supply. But, he said, according to the Fed's model, that contractionary effect is more than outweighed by other effects, especially an expansionary effect *operating through exchange rate depreciation*.

I was stunned. How could the Fed believe that its attempt to depreciate the dollar would work, especially at a time when so many other countries (most obviously, members of the eurozone and Japan) are struggling to restore growth? Indeed, according to IMF research, augmented in Taylor (2016), Fed decisions to lower interest rates have negative effects on economic performance outside the United States—presumably, by disadvantaging foreign exporters. Furthermore, if depreciation is harmful to foreign countries, then wouldn't other central banks respond to Fed actions by intervening to offset the Fed's actions? If so, then the ultimate consequence for exchange rates of Fed policy might be nil. Finally, isn't this a risky strategy for the U.S. central bank? The desirability of avoiding the risks that attend unpredictable depreciation wars among central banks was supposedly a major lesson of the 1930s and a major

reason the IMF was established. How can the Fed defend a policy that will likely be ineffectual (because it will be largely offset by other central banks) and likely will produce a new source of international conflict with the U.S.'s major trading partners?

Even if the Fed were successful in depreciating the dollar, it is not clear that this would boost the U.S. economy. According to the model and evidence in Phelps, Hoon, and Zoega (2005), if monetary policy succeeded in weakening the dollar, that would make U.S. firms respond by increasing their prices, cutting wages, and reducing employment.

I conclude that the Fed's attempt to depreciate the dollar is unwise geopolitically and is unlikely to be an important positive influence on the U.S. economy. The effects of Fed policy on the dollar likely will be offset by other central banks. Moreover, even if the Fed succeeds in depreciating the dollar, U. S. output growth is unlikely to improve and could actually fall (Phelps, Hoon, and Zoega 2005).

Corporate Balance Sheets

According to neoclassical investment theory, lowering interest rates should stimulate investment. However, the link between interest rates and corporate investment has been quite weak in empirical studies of investment. Furthermore, more recent models of investment under asymmetric information have emphasized the importance of healthy balance sheets and the potential constraints on investment that arise when firms suffer adverse shocks to their net worth. For that reason, it is useful to consider balance sheet consequences of the low-interest rate environment.

Keeping interest rates low for a protracted period of time can reduce the net worth of corporations that have large outstanding long-term debts and that operate defined benefit pension plans. According to the *Economist* ("Fade to Grey," September 24, 2016), the consulting firm Mercer estimates that defined benefit plans of large U.S. firms are only funded 77 percent, with a resulting deficit of \$570 billion.

Of course, low interest rates increase corporate debt-raising capacity and raise the present value of firms' expected future cash flows from operations, and those influences should boost stock prices and investment for many firms. It is likely that, on net, the effect of low interest rates on stock prices raises investment a bit, as suggested

by Tobin's Q model of investment. However, investment has not responded very favorably to monetary policy thus far in the recovery. In comparison with other business cycle recoveries, net investment as of 2016 is only about half what past patterns suggest that it should be (Gutierrez and Philippon 2016). The growing funding problem for defined benefit plans, along with the negative effects of Fed policy on loan supply discussed above, likely play a part in the explanation of this puzzling investment behavior.

Asset Prices

QE2 and QE3 were justified primarily as means of reducing long-term interest rates. A microeconomic analysis of the mortgage market by DiMaggio, Kermani, and Palmer (2016) finds that the primary positive effects of QE2 and QE3 were the result of the fiscal policy actions of the Fed, not the growth in its balance sheet. In fact, only the Fed's purchases of MBS seem to have mattered for mortgage prices, suggesting that Fed fiscal intervention to subsidize interest rate risk had little effect.

This finding has a disturbing implication. The primary identifiable positive influence of Fed policy actions for the economy seems to be a new housing price rise caused by Fed fiscal subsidies in the MBS market. In the short run, this has been a positive for the economy, as investment in new housing has boosted income and employment, and house price appreciation has helped to fund increased nonhousing consumption. But, as we learned in the recent subprime crisis, there are significant medium-run risks associated with creating asset price bubbles. Using monetary policy to create a short-lived asset price boom is a way to gain short-term growth at the expense of possible medium-term contraction.

A Monetary Policy Reset

In light of the above observations, consider the following policy proposal. The Fed should abandon its recent untested and risky policy experiments and announce that it is returning to a predictable structure for monetary policy, where it will be clear when the Fed is applying the brake versus the throttle. The key is to raise interest rates to make reserves scarce and employ complementary policies that will restore the usefulness of the federal funds market as the

primary instrument of policy. Doing so would allow the Fed to rely on decades of evidence about the connection between raising or lowering the federal funds rates and consequent changes in economic activity. Furthermore, the Fed should undertake and articulate a systematic approach to policy that makes it clear what the use of that tool is intended to accomplish and how policy will evolve in the future.

Specifically, I propose the following five actions:

1. Announce an intent to raise interest rates (initially repo and federal funds rates, later only federal funds rates) by 2 percentage points in 25 basis point increments over the next 18 months. A 2 percent hike would still imply an accommodative level of interest rates (a real interest rate of zero). Incrementally, this might be accommodative or contractionary, but I do not believe it will be a very large net influence in either direction because of offsetting influences. It would have an immediate positive effect on bank equity values and would boost lending, but it would also have a negative effect on real estate borrowing costs. The main point of the rise in interest rates is to restore normalcy to the federal funds market. Given that objective, other complementary policies are also needed.
2. Eliminate the involvement of government-sponsored enterprises in the federal funds market and raise required reserves for large banks (which currently maintain massive amounts of excess reserves on their balance sheets). Those actions would allow the federal funds rate to serve as a monetary policy instrument once again. The higher reserve requirement would have additional medium-term advantages by reducing inflationary expectations that could result from a boom in bank lending and reduce the scale of the open-market sales needed to achieve the Fed's interest rate target.
3. Set an interest rate rule for the interest paid on reserves that fixes that rate to the federal funds rate less 10 basis points. This action would remove another source of uncertainty and make it clear that the Fed is committed to shrinking its balance sheet to a normal size, rather than undertaking an unpredictable manipulation of interest on reserves to influence bank loan supply.
4. Announce a policy rule (e.g., some version of the Taylor Rule, or some other systematic approach) that would substantially reduce uncertainty about Fed actions for the next several years.

This would make whatever changes the Fed undertakes in the federal funds market predictable, which would strengthen its influence and reduce policy uncertainty.

5. End Fed reverse repo transactions to signal the willingness to sell securities in the Fed's portfolio to achieve its federal funds rate targets and make it clear that the Fed will do so without any concern about the accounting consequences regarding the Fed's prospective contribution to the government deficit. Doing so would also avoid future consequences for the repo market of unpredictable Fed securities sales.

Conclusion

Despite the confident pronouncements of central bankers and the compliant echo chamber of the financial press, the combination of new and untested tools being employed by the Fed—and the unusual circumstances under which they are being employed—make the consequences of changes in monetary policy for the economy highly uncertain.

If the Fed abandoned its untested and risky policy experiments and adopted a systematic policy approach, raised interest rates, and restored the usefulness of the federal funds market as the primary instrument of policy, the Fed would once again be in a position where its incremental influence on nominal GDP growth would be predictable, at least directionally.

The goal of this proposed monetary policy reset is to *restore predictable efficacy* to monetary policy. This could be done with little immediate economic consequences. It might be expansionary in the medium run, and possibly also in the short run, but it also might be mildly contractionary. It is hard to gauge the overall incremental consequences for the economy precisely because different aspects of the transmission mechanism imply opposite effects. Loan supply would rise alongside rising bank equity prices, declining repo funding costs, and reduced policy uncertainty, but housing finance costs would rise and house price appreciation would slow to a sustainable long-run path. In any case, policy would remain accommodative at a zero real federal funds rate. Importantly, the Fed would be in a position to tighten or loosen from that point going forward, would be much more able to achieve legitimate stabilization objectives, and both the Fed and the markets would have a clearer sense of the relationship between Fed actions and economic consequences.

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