

The Microeconomic Perils of Monetary Policy Experiments

Remarks of Charles W. Calomiris¹
Columbia Business School



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ECONOMIC POLICIES FOR THE 21ST CENTURY

¹ Charles W. Calomiris is the Henry Kaufman Professor of Financial Institutions at Columbia Business School and a Professor at Columbia's School of International and Public Affairs. He is an adjunct fellow at the Manhattan Institute, a member of the Financial Economists Roundtable, a member of the Shadow Open Market Committee, and a Research Associate of the National Bureau of Economic Research.

Introduction

Monetary policy affects the economy through a variety of “transmission mechanisms.” For example, when the central bank expands its balance sheet through securities purchases, this increases “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 mortgage-backed securities (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” that required repos to be included in the definition of bank leverage for some banks, that reduced the supply of repos in the market (Allahrakha et al. 2016).

Apart from all of those current actions, the Federal Reserve can also influence markets by issuing “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 has not posed major problems for predicting the influence of monetary policy because the Fed’s actions were limited to targeting the federal funds rate, because the primary tool was open market operations, because the Fed’s activities were confined almost exclusively to the purchase and sale of Treasury bills, because important regulatory policies (capital and liquidity requirements were known and not subject to dramatic change), and because 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 Fed policy actually is stimulating the U.S. economy. I will show that the current stance of monetary policy may be contractionary even in the short run. 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 the Fed's actions will be contractionary.² 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), 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), and 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, and (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

² 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."

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 (see the review of the literature in Aiyar et al. 2015 and the recent evidence for the UK in Aiyar et al. 2014a, 2014b, 2014c, and 2016). 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 raises imposed by the Fed have limited the ability of banks to transform their excess reserves into loans and deposits (see, for example, Allahrakha et al. 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).³ Default risk reduction via loan supply contraction is the most common bank response.

Strong correlation between bank stock price change and loan supply growth in recent years – visible even in graphs of loan growth vs. market equity value change – illustrates this connection (see Bird 2016). Furthermore, the 2008 crisis vividly illustrated how reductions in banks' market values of equity 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).

To the extent that Fed policy damages bank equity values, that constitutes a source of loan-supply contraction. But how does Fed policy adversely affect the market value of bank equity? Isn't the Fed's commitment to low interest rates reducing discount rates for corporate earnings, thereby propping up stock prices in the economy, and shouldn't that raise the market value of banks' equity too?

³ Following 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. From that perspective, uncertainty about the future path of monetary policy has been another adverse influence on loan supply.

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.⁴

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 non-bank 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.

Furthermore, the enactment of the Supplementary Leverage Ratio 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 et al. (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 Tri-Party transactions, the repo collateral employed in Fed transactions cannot be re-hypothecated in other

⁴ David Malpass has written numerous op-ed articles in the *Wall Street Journal* 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.

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 Supplementary Leverage Ratio, 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, that would exacerbate its expected accounting contribution to federal deficits. 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 Supplementary Leverage Requirement was motivated in part by a desire to improve its competitive position in the repo market, but the coincidence in timing between the Supplementary Leverage Requirement 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 Supplementary Leverage Ratio 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, the Euro Area, 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 U.S. That could imply a contraction in U.S. exports as the result of Fed interest rate cuts. 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 International Monetary Fund 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 not only unwise geopolitically, it 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, and even if the Fed succeeds in depreciating the dollar, that is not a reliable means for stimulating output growth in the U.S. According to Phelps, Hoon and Zoega (2005), it will have the opposite effect.

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%, with a resulting deficit of \$570 billion.

Of course, low interest rates raise the present value of firms' expected future cash flows from operations, and that influence should boost stock prices 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, and the growing funding problem for defined benefit plans may be part of the explanation.

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, per se, 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 non-housing 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.

Policy Counterfactual

In light of the above observations, consider the following policy counterfactual. What if the Fed abandoned its recent untested and risky policy experiments and announced that it was adopting a rules-based policy target, raising interest rates, and restoring the usefulness of the federal funds market as the primary instrument of policy? For the sake of clarity, imagine the following five actions: (1) Announcing an intent to raise interest rates (initially repo rates, later federal funds rates) by two percentage points in 25 basis point increments over the next 18 months; (2) Eliminating GSE involvement in the federal funds market and raising required reserves for large banks so that the federal funds rate could serve as a monetary policy instrument once again; (3) Announcing a policy rule (e.g., some version of the Taylor Rule) that would substantially reduce uncertainty about Fed actions for the next several years; (4) Setting an interest rate rule for the interest paid on reserves that fixes that rate to the federal funds rate less 10 basis points; (5) Announcing an end to Fed reverse repo transactions, and a willingness to sell securities in the Fed's portfolio to achieve the aforementioned objectives without any concern about the accounting consequences regarding the Fed's prospective contribution to the government deficit.

The mainstream view would see this as contractionary policy. But it might be expansionary, even in the short run. A stronger argument can be made that it would be expansionary in the medium run (the time horizon that should govern monetary policy). Loan supply and investment would rise alongside rising bank equity prices, declining repo funding costs, and reduced policy uncertainty. Housing price appreciation would slow to a sustainable long-run path. Underfunded pension providers' financial health would improve. The higher reserve requirement would have additional medium-term advantages. Soaking up some of the excess reserves currently in the system through a higher reserve requirement would attenuate any fears about medium-term inflation risk 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.

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 for the economy of current monetary policy highly uncertain.

The Fed's experimental monetary policy likely is having a small effect on the economy, which is probably contractionary (but highly uncertain in the direction of its effect). Fed fiscal policy (subsidizing the mortgage market) is probably

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). Fed regulatory policy is contractionary in the short- and medium runs.

If the Fed abandoned its untested and risky policy experiments and announced that it was adopting a rules-based policy target, raising interest rates, and restoring the usefulness of the federal funds market as the primary instrument of policy, then that combination of policies likely would be expansionary in the medium run, and possibly also in the short run. Loan supply and investment would rise alongside rising bank equity prices, declining repo funding costs, and reduced policy uncertainty, including reduced inflation uncertainty. Housing price appreciation would slow to a sustainable long-run path. Underfunded pension providers' financial health would improve.

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