

Monetary Policy in a Low-Interest-Rate Environment

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A Panel Discussion at the National Bureau of Economic Research's
International Seminar on Macroeconomics
Lemesol, Cyprus

June 13, 2009

I appreciate this opportunity to discuss aspects of quantitative easing with some former central bank colleagues on this panel.

Today's topic is monetary policy in a low interest rate environment. For the Federal Reserve, which will be my main focus, that means quantitative easing because the federal funds rate has already been effectively brought to zero. My presentation today will have three parts. First, I will discuss the channels through which quantitative easing works, because that sets up a basis to evaluate the policy. Second, in what may sound ironic, I will explain why quantitative easing is hard to quantify. That will say something about the ways central banks operate and about the current state of economics and finance. Last, I shall discuss the risks associated with quantitative easing. This will highlight the importance of having an exit strategy. In that regard, this discussion should not be viewed as relevant exclusively to the Federal Reserve. Any central bank confident in its ability to exit might be more willing to enter a period of very low interest rates.

Q.E., Q.E.D.

Quantitative easing, or Q.E., holds that the size and composition of the central bank's balance sheet influences financial markets and the economy over and

beyond the level of the policy rate. One consequence of this definition is that policy does not necessarily run out of ammunition at the zero bound. That is, the central bank can still manipulate its balance sheet even as its policy rate is pinned at zero. This definition also implies that Q.E. is not just about the level of reserves. The level of reserves is one portion of a central bank's balance sheet, but other liabilities and the size and composition of its assets can also influence the macroeconomy. In addition, this definition implies that quantitative easing can be undertaken at a non-zero policy interest rate. This is relevant both for the central banks that have not already put the pedal fully to the metal, such as the European Central Bank, and for those who have but are planning now how to unwind policy stimulus.

Quantitative easing potentially works on both sides of a central bank's balance sheet in the manner described by Bernanke and Reinhart (2004).

- (1) The large provision of reserves may induce banks to make use of idle balances, which is the traditional **money-multiplier** effect. Even as the policy rate is pushed to zero, reserves can expand, potentially massively, providing banks the wherewithal to support deposit creation, if they are so inclined.
- (2) The over-provision of reserves also could help convince market participants that the policy interest rate will be low for a long time. This is known as the **policy duration** effect. This simply recognizes that the bigger is the balance sheet, the longer it will likely take to shrink (in the manner described by Obstfeld and Auerbach, 2004).

- (3) On the asset side, the accumulation of portfolio holdings might influence relative spreads and the function of markets, which is an **asset substitution** effect (in the manner of Tobin, 1970).
- (4) A central bank holding more assets, particularly those that have higher returns than typical and importantly above the remuneration on deposits, should generate additional income. This central bank profit may encourage the government to spend more or to cut taxes, which is known as **creating fiscal space**.

As an aside, Federal Reserve officials apparently had a stab at rebranding quantitative easing. The Fed started Q.E. in October 2008, seen in the upper panel of Figure 1 as the massive increase in reserves. That provision of liquidity drove the funds rate effectively to zero (the lower panel), even as the official target was still 1 percent. Despite both the evidence in quantities and prices, officials seemed reluctant to describe their policy as quantitative easing.¹ It might have been because Q.E. was thought to describe the narrow provision of reserves. More likely, I believe, is that the Fed expanded its balance sheet as its microeconomic programs ballooned, as saw this as an extension of its credit policies. The Fed did not formally embrace quantitative easing for macroeconomic reasons until mid-December, when the Federal Open Market Committee officially pushed its target rate to 0 to ¼ percent.²

¹ Note, for instance, that Chairman Bernanke's testimony on monetary policy and the outlook on October 20, 2008 was silent on the level of reserves and the federal funds rate., at <http://www.federalreserve.gov/newsevents/testimony/bernanke20081020a.htm>

² This is noted in the statement of the Federal Open Market Committee at the conclusion of its year-end meeting on December 16, 2008, at <http://www.federalreserve.gov/newsevents/press/monetary/20081216b.htm>

Quantifying Quantitative Easing

My second topic is the ongoing crisis and the quantification of quantitative easing. This is not just a crisis in global financial markets and economies; it is also a crisis in economics and finance. The models we have been using do not adequately capture Q.E. Modern macroeconomic models used to evaluate policy have three main features. First, they net across entities and describe the behavior of the representative agent. Thus, gross positions do not matter. Second, quantitative models tend to assume arbitrage across markets. This means that a small set of financial market prices, perhaps even a single one, can describe the whole spectrum of financial market returns. Third, and as a result, these models reduce monetary policymaking to the control of the short-term interest rate.

As a consequence, the evaluation of Q.E. has thus far focused on what can be explained internally in these models, what can be imposed from the outside on these models, and what can be observed in a model-free manner.

Internal to models. To be a bit more specific, the policy duration effect is the main channel that can be measured internally to most models. If interest rates are expected to stay pinned at zero for longer than previously expected, a researcher can show how that surprise plays through the yield curve and influences the economy. Most of the work on the Bank of Japan experience has emphasized this policy duration effect (as discussed in Bernanke, Reinhart, and Sack, 2004).

External to models. The same models can be used in an ad hoc manner to consider the effects of external forces. For instance, what happens if a particular

relative spread widens? “Ad-factoring” one of the equations explaining spending proxies this event, much in the manner decried by Sims almost thirty years ago (Sims, 1980). Implicit in that implementation of a shock is the view that the cost of intermediation rises in a crisis, and that is probably right. More problematic is the incidence of the shock. How those higher costs are passed along in terms of rates and quantities—that is, the cost and availability of funds—depend on the structure of the industry. In Reinhart and Reinhart (1999), for instance, the effects of an increase in reserve requirements in a small open economy are shown to depend on whether banks have market power in deposit creation or lending.

Event studies. Lastly, event studies around policy announcements quantify policy effects outside any one particular model (exercises that are also considered in Bernanke, Reinhart, and Sack, 2004). The problem with event studies, of course, is the questions that remain implicit. How much of the announcement was expected? How effectively was the policy explained? What happened outside the window? Indeed, the tyranny of event studies tends to focus attention on what central banks do, because the reaction that can be measured in a narrow window. Less well understood, then, is the consequence of policy inaction, or the dog that did not bark, which plays out at a vague, hard-to-measure, pace.

This perspective helps to explain the macro model U.S. policymakers must have in the recesses of their minds. In particular, their model must allow some role for imperfect asset substitutability. That is the only way that purchases of Treasury securities, as the Fed has done, would be expected to lower private spreads. Bank

profits must also enter that model. The stress tests of the banking system emphasized flow profits, rather than legacy losses.³ If it was important to shift the focus of financial market participants to ongoing profits, implicitly profits must matter. Lastly, officials must hold the view that central bank profits matter. If not, we would not hear all this talk about concerns over potential losses.⁴

Risks Associated with Q.E.

Given the venue for this conference, here on the Mediterranean island from which Aphrodite emerged from the sea, it is reasonable to ask two fundamental questions found in the classics. Those questions concern risks associated with quantitative easing.

First, does quantitative easing risk flying too close to the sun, in the manner of Icarus? Policymakers and outside observers often voice reservations about the longer term consequences of quantitative easing. There seems to be a fear that policy will be decidedly asymmetric. Reluctantly removing massive accommodation that was put in place aggressively might risk longer-term inflation prospects. Implicit in this view is a dark interpretation of the political economy and a fear that inflation expectations are changeable.

Second and in contrast to the threat from the sun, is not resorting to Q.E. living fearfully in the shade? In that regard, consider the words of Aristophanes in his play, *The Wasps*. He wrote, “Why do we delay to let loose that fury, that is so

³ The stress tests are described at <http://www.financialstability.gov/latest/tg91.html>.

⁴ This is not an area the academic profession has directed much attention toward in the past two decades. For an earlier generation, including Metzler and Mundell, the treatment of central bank profits was an important mechanism in the transmission mechanism, as is shown rigorously in Obstfeld (1982).

terrible, when our nests are attacked?”⁵ This aptly summarizes a threat to a central bank’s legitimacy from another direction: What would happen if it were seen as not using the policy tools at its disposal in a time of great risk to society?

When considering the risks of quantitative easing, it is important to remember that the tools that allow the expansion of the central banks balance sheet are not inherently asymmetric. Mechanically, the central bank can shrink its balance sheet just as fast as it was expanded. Rather, the question is about the willingness of the central bank to be symmetrically aggressive, not the ability. In that regard, quantitative easing is probably most effective when there is a well-defined exit strategy. The anchoring of inflation expectations in the long-run at an appropriate level gives policymakers leeway to be aggressive in the short run.

Some comfort can be taken from the fact that the Bank of Japan was able to unwind its balance sheet relatively quickly. In five remarkable months in 2006, the BoJ shrank total assets by about a fifth. As seen in Figure 2, that contraction came mostly from its portfolio of government securities. The short average maturity of that portfolio allowed the asset stock to contract by merely rolling off maturing obligations.

While this has been done before, there are reasons to be concerned about the Federal Reserve’s willingness to head for the exit. There are four sources of concern. First, policymakers might be unwilling to test the resilience of markets. They might easily convince themselves that the improvement in markets and the economy is due

⁵ The text of the play can be found at <http://classics.mit.edu/Aristophanes/wasps.html>.

to the massive size of the Federal Reserve balance sheet. While financial markets and the economy might be better, they might not be strong enough to withstand the removal of that accommodation. A regular tendency over time and across countries is that policy rates move asymmetrically. Policy rates tend to decline quickly and increase slowly. This is referred to as going up by the escalator and down by the elevator.⁶ If policy rates are asymmetric even though there is no obvious cost to adjustment, we should not be surprised to find that changes in the balance sheet are similarly asymmetric.

Second, some long-lived assets on the Federal Reserve balance sheet might no longer have markets when the time comes for the Fed to want to sell them. This mostly holds for the assets in the special purpose vehicles and the potential purchase of legacy securities as part of the Treasury's rescue plan.⁷

Third, the Treasury has funded a portion of some Fed programs by providing a first loss-tranche. If the Treasury was present at the creation, does it also have to be amenable at the closure?

Fourth, political pressures might be intense. The Fed has been able to play a forceful role in affecting private credit markets. The Congress might view this as the purview of fiscal policy and be more willing to interfere with those decisions going forward.

⁶ For example, Fed Vice Chairman Donald Kohn made this observation in a speech, "Monetary Policy over Fifty Years," at a conference to mark the fiftieth anniversary of the Deutsche Bundesbank," in Frankfurt, Germany on September 21, 2007 at

<http://www.federalreserve.gov/newsevents/speech/kohn20070921a.htm>

⁷ In that regard, the Fed has already reached an accord with the Treasury for it to assume those special purpose vehicle assets when the time comes.

My preferred solution is not to let the possibility that the Fed may fail to do the right thing in the future prevent it from doing the right thing now. As long as resource slack is considerable and deflation a palpable threat, the right thing is to keep the Federal Reserve balance sheet massive. At a later date, the Fed will have to be forceful in exiting that position. Investors can be provided reassurance now by putting mechanisms in place that force good behavior in the future. Three items come to mind. First, the Federal Reserve could be given a formal inflation goal by the Congress. That would help anchor inflation expectations and prove that the Congress will not be recalcitrant at a later date.⁸ Second, the Fed could change its regulations to harden the floor on deposit rates. Back in November and December of last year, the federal funds rate often traded below the deposit rate. That is, some market participants were willing to lend funds into the market for a lower rate than they could receive on deposits at the Federal Reserve. The reason behind this phenomenon is that not every reserve holder receives interest on reserves. That can be changed. Third, a term limit on holding private credit risk funded with reserves would force the Federal Reserve to either seek funding from the Treasury or to sell those assets.

Conclusion

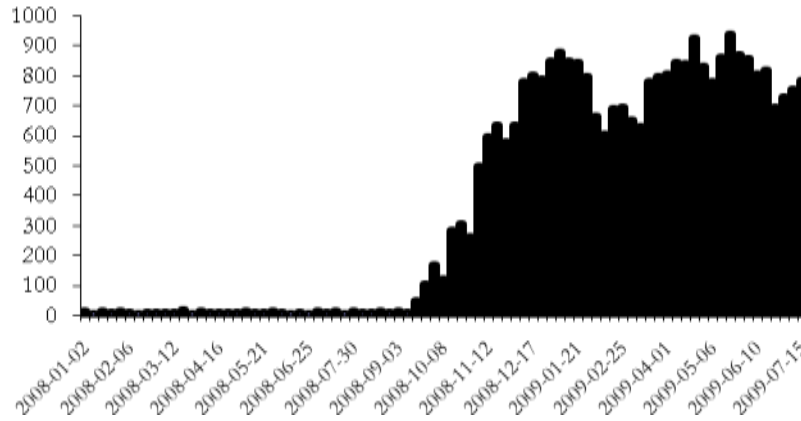
Central banks in many countries are in uncharted waters. Their task is made more difficult by the lack of tools provided by the economics and finance profession.

⁸ This is an initiative discussed by Bernanke, Laubach, Mishkin, and Posen (2001), among others.

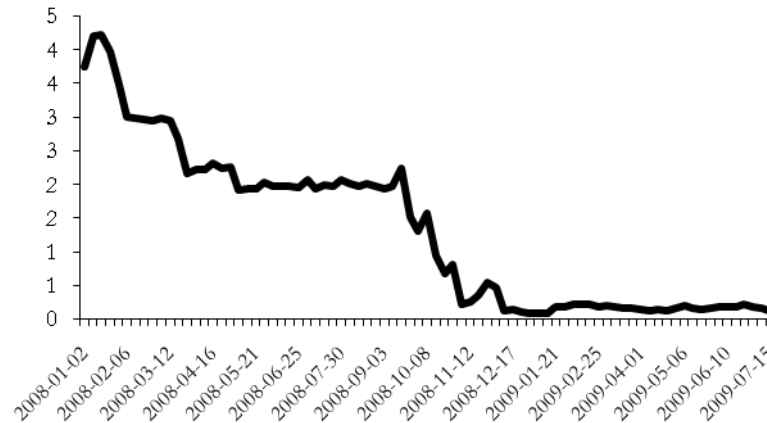
The experience of last year and probably the next will be challenging. But it will also enrich our understanding of how monetary policy and economies work.

Figures

Figure 1
Reserve balances at the Federal Reserve
billions of dollars



Effective federal funds rate
week ending Wednesday, percent



Source: FRB St. Louis, FRED

Figure 2
Assets of the Bank of Japan
 100 million yen



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