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Michael Woodford
Columbia University

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In the global financial crisis and its aftermath, central banks have undertaken unprecedented actions of many kinds. This raises a natural question: Has the crisis revealed that the previous consensus framework for monetary policy was inadequate and should now be fundamentally reconsidered? It is surely true that central banks were not too well prepared for the crisis and that new policies had to be created, to a large extent on the fly. And it would obviously be desirable to try to learn from this experience, in order to be better prepared for an appropriate response next time and perhaps even to reduce the probability of there *being* a next time.

But I don't think this means that all of the previous conventional wisdom must now be discarded. In particular, I don't think it has been shown to have been a mistake for central banks to commit themselves to explicit, quantitative inflation targets. Inflation targeting—and the "implicit" inflation targeting that was practiced by some other central banks—has resulted in a high degree of stability in medium-run inflation expectations during the crisis and its aftermath, and I believe that this has improved the stability of the real economy as well. If the prolonged high unemployment of the past several years had led to a deflationary spiral, our situation would surely have been far worse. I believe that this has been a benefit of the credibility for inflation stabilization achieved by the Fed and other central banks in the years prior to the crisis and not something that we should want to casually discard.

Nevertheless, I think it is important to stress that inflation targeting need not mean and should not mean the caricature of it that one sometimes hears, according to which it means making inflation control the sole objective of policy at all times, in the view that inflation stabilization by itself will be sufficient to guarantee macroeconomic stability. Recent events have obviously cast considerable doubt on this overly simplistic view. However, it's important to remember that this was not the view advocated by most proponents of inflation targeting even before the crisis. Mervyn King famously called that view the "inflation nutter" position in one of his classic early discussions of the theory of inflation targeting[1] and argued instead for a more flexible form of inflation targeting. Other leading proponents of inflation targeting, such as Ben Bernanke and Lars Svensson, also consistently argued for a flexible conception.[2] They believed that it was important to conduct monetary policy in such a way as to maintain medium-run inflation expectations relatively constant at the preannounced target rate, but it was permissible to allow temporary departures of the inflation rate from this medium-run target for the sake of other stabilization objectives. A near-term inflation rate near the target was neither necessary nor sufficient for good policy.

But this doctrine, while sensible as far as it goes, does leave an important question unanswered: What does it mean to conduct policy in the short run in such a way as to ensure that medium-run inflation expectations should remain anchored, even though one is not always acting to keep inflation as close as possible to the medium-run target? Inflation-targeting central banks talk a lot about how they try to assess whether inflation expectations are still anchored and whether their internal models still forecast an inflation rate near the target some years in the future, but they are frequently less clear about what it is about the way in which they intend to make policy decisions that would make that a correct expectation.

Vagueness on this point didn't create great difficulties in the 15 years or so of relative macroeconomic stability prior to the global financial crisis. But when larger disturbances occur, the incompleteness of the flexible inflation-targeting doctrine becomes more of a problem.

Inflation-targeting central banks have recently been conducting policy in ways that don't seem to be directly dictated by their inflation-targeting framework, but that raises questions about whether the framework remains in effect.

In my view, flexible inflation targeting doesn't need to be repudiated as a policy framework, but it does need to be *completed*. Inflation-targeting central banks need to commit themselves not only to a medium-run inflation target but also to criteria for making nearer term policy decisions that will, among other desiderata, imply that the inflation rate should be near the target if one averages over a sufficient number of years.[3]

As an example of such a criterion, a central bank might commit itself to make short-run decisions so as to keep nominal GDP as close as possible to a particular target path, even in the nearer term. The target path for nominal GDP could be chosen so that keeping nominal GDP on that path should ensure, over the medium run, an average inflation rate equal to the inflation target. At the same time, it would imply that inflation would not be the sole determinant of short-run policy decisions. For example, a loosening of policy might be appropriate even when inflation is not running below target, because insufficient real growth has resulted in a level of nominal GDP below the target path.[4]

Another respect in which inflation-targeting doctrine prior to the crisis has proven to be incomplete is in its failure to say how policy should be conducted if aggregate demand remains insufficient to achieve the central bank's stabilization targets, even when the zero lower bound on short-term nominal interest rates is reached, as it has been in many countries over the last few years.

One approach used by several central banks has been "forward guidance"—indications by the central bank that interest rates will remain low in the future, as a substitute for further immediate interest rate cuts. Such announcements do seem to have been able to influence market expectations about future short-term rates and hence to influence longer term interest rates and other asset prices. But important questions remain about the form that such forward guidance should take and about how the existence of such statements should constrain subsequent policy decisions.

One question is whether forward guidance should take the form of a statement about future policy *intentions,* or if it suffices for the central bank to offer a forecast of its likely future decisions, given the conditions that can be anticipated at present. The idea of merely offering a forecast has had a certain appeal to central bankers, since it doesn't tie the hands of the future policy committee. Unfortunately, there is no obvious reason for a mere forecast to be effective in stimulating demand.

In order for a central bank forecast of future interest rates to change market expectations, it would have to reveal either new information about likely future conditions or new information about the central bank's future policy reaction function. But convincing people that interest rates will remain low for longer than they had previously expected—either because the economic recovery will be slower than previously expected or because deflation is coming, and not because of any change in the central bank's reaction function—should be expected to have a contractionary rather than an expansionary effect on current expenditure.[5] This is surely not the aim of forward guidance at the zero lower bound. Hence, in order to be effective, the announcement must communicate a different view of the future reaction function; that is, of the conditions under which policy will or will not be tightened in the future.

But if this is the goal, a mere forecast of future interest rates is not the most effective way to change expectations. If a central bank intends to conduct policy later in a way that is different from what people in the markets would already expect, then it should seek to communicate that intention by talking directly about how future policy decisions will be made.

What kind of statements about future policy decisions would be desirable if that were one's aim? Recently, several central banks have made statements about specific dates until which the policy rate is expected to remain at its lower bound. But while traders and financial markets are certainly interested in hearing about such dates, I don't think a date-based approach makes sense as a way of communicating about future policy intentions. It would not make sense, after all, for a central bank to actually bind itself not to consider raising rates before a specific date as far as two years in the future regardless of what may occur in the interim. Hence it is hard for date-based forward guidance to be understood as a genuine communication of policy intentions rather than as a mere forecast.

A better approach will instead specify economic conditions that must be reached in order for it to be appropriate to raise the policy rate. Such a statement should allow market participants to form judgments about the likely length of time for which low rates should continue, but it will imply that the actual liftoff date would depend on future outcomes, as indeed it should.

The recent move of the U.S. Federal Open Market Committee (FOMC) to replace date-based forward guidance with explicit numerical thresholds for economic indicators is a desirable step, in my view. The thresholds, however, have had to be determined on an ad hoc basis and don't obviously follow from previously announced policy targets. Nor do they indicate the policy that one should expect the FOMC to follow after the current anomalous period.

Under the version of flexible inflation targeting that I've just proposed, the criterion for liftoff from the zero lower bound could follow from the same target criterion that guides policy decisions at other times. A central bank that seeks to use its policy instruments to keep nominal GDP on a certain, steady growth path could also, when the zero lower bound makes it unable to prevent a sustained shortfall of nominal GDP relative to the target path, commit itself to maintain unusual policy accommodation until nominal GDP can be brought back to that target path, even though this would mean seeking higher than average nominal growth during a transitional period.[6]

An approach of this kind to forward guidance during a zero lower bound episode would have two advantages over the ad hoc approach. First, it would provide an explanation for pursuing unusually aggressive policies in the aftermath of a zero lower bound episode, even as monetary stimulus begins to have effects, and it would do this in a way that should not create doubts about the cumulative increase in prices that might occur before the policy has ended, for the existence of a target path for the level of nominal GDP—a target that has not been raised as a result of the crisis—implies that nominal growth should indeed be capped. And the pursuit of such a temporary policy would remain perfectly consistent with a stated intention to pursue a subsequent approach to policy (namely, keeping nominal GDP near that target path) that should once again deliver an average inflation rate near the long-run inflation target.

The second advantage that I see is that if such a policy were expected to be followed as soon as the zero lower bound is reached, this anticipation should have a stabilizing effect, reducing the distortions associated with the zero lower bound on interest rates. If a decline in nominal GDP growth owing to an inability to cut the policy rate below the zero lower bound were expected to automatically imply faster nominal GDP growth later to undo the shortfall, this anticipation should reduce the size of that initial shortfall.

I've said earlier that I believe that confidence that central banks would not allow inflation to drift permanently below their long-run inflation targets has been a stabilizing factor in the recent crisis. In the same way, I believe that had there been an existing commitment to a nominal GDP target path, this would have been an even greater stabilizing factor.

Finally, another question raised by the recent crisis is whether central banks should have paid more attention to the growing risks to financial stability before the crisis. Or, to pose the more practical question for us now, to what extent should central banks consider risks to financial stability when making monetary policy decisions going forward?

Certainly, this issue can't be dismissed as easily as it often was before the crisis. A popular argument then was that it was difficult to be sure a bubble was forming before it burst and that it was therefore more practical not to consider the question until after the crash, and then use monetary policy to deal with the consequences of the crash. But surely recent events have dented our confidence regarding how easy it is to "mop up after the crash" with the tools actually available to central banks.

It therefore makes sense going forward to seek to assess potential risks to financial stability before they grow too large, as difficult as that undoubtedly will be. This does not, however, mean that monetary policy should be the only line of defense. To say that monetary policy might have some capacity to restrain the growth of dangerous degrees of leverage doesn't imply that no other measures to restrain such developments should be needed, if only we had a sound monetary policy.

Using monetary policy for this purpose, even under the assumption that it could be fully effective, would surely have costs in terms of decreasing the extent to which monetary policy can simultaneously achieve its usual stabilization objectives. Hence, it behooves us to seek to improve financial regulation, and to develop instruments of macroprudential policy as well. Multiple instruments should increase the extent to which multiple objectives can simultaneously be pursued, and they are much to be desired in this case.

Still, in our current situation, without yet having these alternative policies that can be relied upon to fully eliminate the issue of controlling risks to financial stability, how should monetary policy take account of the issue? I think one must recognize that simply tracking the outlook for measures of inflation and real activity is not, in general, going to be sufficient for sound monetary policy decisions. It may well be that under most circumstances, risks to financial stability will be small enough under all of the currently contemplated interest rate decisions for interest rate policy to be set purely on the basis of expected consequences for inflation and output. But one should at least recognize the possibility of exceptions to that situation and keep an eye out for them.

This means that the proposal I've been describing—that interest rate policy be used to keep nominal GDP on a fixed target path, should not be viewed as an absolute rule. It might well be reasonable, under some circumstances, to maintain tighter policy in order to restrain excessive growth of leverage, even if this requires nominal GDP to fall below the target path. But this would not, in my view, make the existence of a nominal GDP target path pointless.

In particular, I believe that even in the case of a temporary departure from the nominal

GDP target path because of financial stability concerns, it makes sense for the central bank to remain committed to eventually reaching that target path again, through a subsequent period of higher than average nominal growth to make up for the period of insufficient nominal growth.[7] The argument is the same as in the case of the zero lower bound; an expectation that current undershooting of the nominal GDP target path will subsequently be compensated by a period of higher nominal GDP growth should reduce the extent to which a temporarily high policy rate causes nominal GDP to undershoot in the first place.

To the extent that such anticipation effects occur, they should reduce the tension between the goals of restraining risks to financial stability on the one hand and maintaining macroeconomic stability on the other. This is another advantage of modifying the understanding of flexible inflation targeting in the more ambitious way I've just sketched.

Notes

[1] Mervyn A. King. "Changes in UK Monetary Policy: Rules and Discretion in Practice," *Journal of Monetary Economics* 39: 81–97, 1997.

[2] See, for example, Ben S. Bernanke and Frederic S. Mishkin, "Inflation Targeting: A New Framework for Monetary Policy?" *Journal of Economic Perspectives* Spring 1997: 97–116; Ben S. Bernanke et al., *Inflation Targeting,* Princeton: Princeton University Press, 1999; Lars E. O. Svensson, "Inflation Targeting: Some Extensions," *Scandinavian Journal of Economics* 101: 337–361, 1999; and Lars E. O. Svensson, "Inflation Targeting as a Monetary Policy Rule," *Journal of Monetary Economics* 43: 607–654, 1999.

[3] For further discussion of the desirability of such an intermediate target criterion, see Michael Woodford, *Interest and Prices: Foundations of a Theory of Monetary Policy,* Princeton: Princeton University Press, 2003, chapter 7; "The Case for Forecast Targeting as a Monetary Policy Strategy," *Journal of Economic Perspectives*, Fall 2007, 3–24; and "Forecast Targeting as a Monetary Policy Strategy: Policy Rules in Practice," in E. F. Koenig, R. Leeson, and J. B. Taylor, eds., *The Taylor Rule and the Transformation of Monetary Policy,* Stanford, CA: Hoover Institution Press, 2012.

[4] A nominal GDP target path can be viewed as a simpler version of the proposal of a target path for an "output-gap-adjusted price level," a proposal that can be shown to represent a theoretical ideal in certain New Keynesian models, as discussed in Michael Woodford, "Optimal Monetary Stabilization Policy," in B. M. Friedman and M. Woodford, eds., *Handbook of Monetary Economics,* vol. 3B, Amsterdam: Elsevier, 2011. On the advantages of a nominal GDP target path as a practical proposal, see Michael Woodford, "Methods of Policy Accommodation at

the Interest-Rate Lower Bound," in *The Changing Policy Landscape,* Kansas City: Federal Reserve Bank of Kansas City, 2012; and "Inflation Targeting: Fix It, Don't Scrap It," in L. Reichlin and R. Baldwin, eds., *Is Inflation Targeting Dead? Central Banking After the Crisis,* London: Centre for Economic Policy Research, 2013.

[5] For further discussion, see Woodford, "Methods of Policy Accommodation," 2012.

[6] The way this would work and advantages of this proposal over the kind of thresholds introduced by the FOMC are discussed further in Michael Woodford, "Forward Guidance by Inflation Targeting Central Banks," http://www.columbia.edu/~mw2230/RiksbankIT.pdf.

[7] See Michael Woodford, "Inflation Targeting and Financial Stability," Sveriges Riksbank *Economic Review* 1: 7–32, 2012, for an analytical demonstration that a rule of this kind represents an optimal policy commitment in the context of a simple New Keynesian model with a trade-off among the three goals of inflation stabilization, output-gap stabilization, and minimization of the economic distortions associated with financial crises. The rule shown there to be optimal generalizes the optimal policy rule for a New Keynesian model that abstracts from endogenous risks to financial stability; thus, it actually involves a target path for an output-gap-adjusted price level rather than for nominal GDP. Under the optimal commitment, the deterministic target path for this variable is not shifted by variations in financial risk or by the occurrence of financial crises, but temporary departures from the target path are justified in proportion to variations in a "marginal crisis risk" variable. The variant with a constant target path for nominal GDP is intended as an approximation of the optimal rule derived there (which is, however, only exactly optimal under quite specific assumptions).