Forward Guidance

Perspectives from Central Bankers, Scholars and Market Participants

Edited by Wouter den Haan

CEPR

A VoxEU.org eBook

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Foreword

Since the onset of the Global Crisis in 2008, CEPR's policy portal VoxEU.org has produced a string of eBooks on issues related to the crisis written by world-leading economists, practitioners and specialists. The books are produced rapidly and designed to provide expert and timely advice and guidance for policymakers on potential solutions. This new eBook on forward guidance is very much in this spirit.

Forward guidance is the practice of communicating the future path of monetary policy instruments. Such guidance, it is argued, will help sustain the gradual recovery that now seems to be taking place while central banks unwind their massive balance sheets. This eBook brings together a collection of contributions from central bank officials, researchers at universities and central banks, and financial market practitioners. The contributions aim to discuss what economic theory says about forward guidance and to clarify what central banks hope to achieve with it.

Wouter den Haan concludes his editorial introduction by observing that "*The best time for forward guidance may lie in the future … providing information on the path towards normalised monetary policy could become very useful and central banks will have to consider seriously if, and if so how, they would do this*." Given this, it seems likely that the analysis in this eBook will remain relevant for years to come.

We are very grateful to Wouter for the energy and expertise he has shown in organising and editing the inputs to this eBook; we are also grateful to the authors of the chapters for their rapid responses to the invitation to contribute. As ever, we also gratefully acknowledge the vital contributions of Anil Shamdasani and Charlie Anderson, CEPR's Publications Officer, for their characteristic speed and professionalism in producing the book.

Stephen Yeo
Chief Executive Officer, CEPR
21 October 2013

Introduction

Wouter den Haan
Centre for Macroeconomics, LSE and CEPR

Forward guidance is the provision of information by central banks about the future conduct of monetary policy and in particular about the central bank's policy interest rate.

Forward guidance is aimed at influencing the public's expectations. This goal is not new; it has long been understood that managing expectations is an important part of monetary policy. In fact, following the high inflationary 1970s, institutions were put in place to credibly anchor expected inflation rates to a low target level.[1] The economic logic for this sort of expectations management is simple. Prices and wages set today depend crucially on people's expectations of the future paths of prices and wages. For example, *current* inflation will be lower when expected *future* inflation is lower.

Forward guidance shares the basic economic logic that links today's decisions to future expectations, but it differs in its subject. Forward guidance focuses on the *instruments* of monetary policy rather than the *targets* of monetary policy.

But this aspect of monetary policy is also not new. Before the Global Crisis, monetary policy committees provided information about their policy interest rate in future periods as well as setting the current rate. Some did so explicitly – providing a numerical forecast of the forward path of the policy interest rate. Other monetary policy setters did it implicitly – providing more or less explicit messages in official statements and speeches.

What is new is the scope and motivation for using forward guidance as a monetary policy tool. This has changed substantially during the recent economic downturn for several central banks. The aims of this eBook are to:

1 See Sheard (2013, this eBook).

- highlight how the implementation of forward guidance has evolved over time;
- clarify what central banks hope to achieve with forward guidance;
- discuss what economic theory says about forward guidance; and
- raise possible objections to forward guidance or to the way it is currently implemented.

To accomplish these goals, the eBook brings together a collection of contributions written by a diverse group of authors. They include:

- central bank officials from the Bank of England, the Bank of Japan, the ECB, and the US Federal Reserve;
- researchers at universities and central banks; and
- financial market practitioners.

Different types of forward guidance: Delphic and Odyssian

With forward guidance, central banks provide information about future monetary policy. This can be done by announcing numerical guidelines for the forward path of the policy interest rate, or through less quantitative verbal statements. An example of the latter would be the announcement that a monetary policy committee has a bias towards an increase at the next meeting. The phrasing in such statements is not always unambiguous, as demonstrated by the following statement of the Federal Open Market Committee (FOMC) reported in Rudebush and Williams (2006): "*Policy accommodation can be removed at a pace that is likely to be measured*".

The Reserve Bank of New Zealand began announcing a forward path for the policy interest rate as part of its usual routine in 1997, followed by the Norges Bank in 2005, the Riksbank in 2007, and the Czech National Bank in 2008. Campbell et al. (2012)

refer to such announcements as Delphic forward guidance, because it provides a forecast, but no commitment of any kind.

The Bank of Japan was a pioneer in using forward guidance as an accommodative monetary policy. In 1999, the Bank of Japan found itself in a situation in which the policy interest rate could not be reduced any further to stimulate the economy and to reverse deflationary pressure. It announced that interest rates would stay at zero until deflationary concerns were dispelled. This is referred to as state-contingent forward guidance.

When the financial crisis erupted, central banks slashed policy interest rates to values close to zero and this was not enough to stabilise financial markets and turn the economy around. Central banks provided further support to financial markets and economy activity through purchases of a range of financial assets and by accepting a larger set of assets as collateral.[2]

As the crisis developed, central banks started to explore different forms of forward guidance. The initial attempts were modest. In December 2008, the FOMC announced that "*[t]he Committee anticipates that weak economic conditions are likely to warrant exceptionally low levels of the federal funds rate for some time*". In March 2009, "*for some time*" was replaced by "*for an extended period*". This is 'open-ended' forward guidance, since it is not clear when the policy of exceptionally low interest rates will end. In contrast, 'time-contingent' forward guidance does indicate the end date. Time-contingent forward guidance was initiated by the Riksbank. On 21 April 2009, the Riksbank lowered its repo rate to 50 basis points and release a statement saying that "*the repo rate is expected to remain at a low level until the beginning of 2011*". A few hours later, the Bank of Canada announced that "*[c]onditional on the outlook for inflation, the target overnight rate can be expected to remain at its current level [of 0.25%] until the end of the second quarter of 2010*".[3] Although, there is a clear escape clause or

2 See IMF (2013) for an overview.
3 The Bank of Canada raised the target interest rate to 0.5% June 1 2010.

'knockout', this type of statement suggests commitment. Campbell et al. (2012) refer to forward guidance with commitment as Odyssian forward guidance.[4]

The Federal Reserve followed the lead of the Bank of Canada. In particular, the August 2011 FOMC statement announced that the Fed would keep its policy interest rate exceptionally low until "*at least ... mid-2013*" and the anticipated period was extended to "*late 2014*" in the January 2012 statement. The downside of time-contingent forward guidance is that the market may take the length of the announced anticipated period as an indication of the seriousness of the problems affecting the economy. Moreover, time-contingent forward guidance has not been very convincing to financial markets. Chehal and Trehat (2009) and Woodford (2012) demonstrate this for the 21 April 2009 forward guidance policy of the Bank of Canada and Woodford (2012) does this for the forward guidance policy of the Riksbank started at the same date. As argued, just stating that interest rates will be exceptionally low for some time is not enough. Market participants need to be informed of how the central bank will make decisions in the future and how keeping interest rates exceptionally low for an extended time period is justified by the central bank's views.

State-contingent forward guidance

Possibly because of these lessons, both the Bank of England and the Federal Reserve adopted state-contingent forward guidance. The FOMC statement of the 30-31 July meeting announced that "*the Committee decided to keep the target range for the federal funds rate at 0 to 1/4% and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6-1/2%, inflation between one and two years ahead is predicted to be no more than a half percentage point above the Committee's 2% longer-run goal, and longer-term inflation expectations continue to be well anchored*". Similarly, at its

4 Odysseus enjoyed the beautiful and irresistible Siren call, but remained on course and avoided the Siren's trap, because he got himself tied to the mast and his crew had wax in their ears.

1 August meeting the Monetary Policy Committee of the Bank of England *"agreed its intention not to raise Bank Rate from its current level of 0.5% at least until ... the unemployment rate has fallen to a 'threshold' of 7% ..."*. In addition to conditions related to inflation, the Bank of England included the condition that monetary policy could not pose a significant threat to financial stability.

Faced once more with deflationary pressure, the Bank of Japan has again relied on forward guidance. On 4 April 2013, it introduced a forward guidance policy,[5] with one striking difference with the forward guidance policy implemented by the other central banks. Whereas the forward guidance policies of other central banks have specified periods during which particular policies would be put in place, the Bank of Japan gives a time period, namely two years, for achieving an *objective*, namely a 2% inflation rate. Shirai (2013, this eBook) argues that this calendar aspect helps to make the forward guidance of the Bank of Japan more convincing. Since the unemployment rate in Japan is actually quite low and the public is aware of the deflationary pressure, it is unlikely that giving a specific date changes the public's view on the severity of the problems facing the Japanese economy, whereas this may be the case when forward guidance specifies how long a particular policy will (need to) remain in place.

The forward guidance by the ECB is still of an open-ended nature. On April 4 2013, it announced that "*[t]he Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time*". One possible reason why the ECB did not opt for the type of state-contingent forward guidance adopted by the Bank of England and the Federal Reserve is that its main aim was to clarify to financial markets the ECB's assessment of the state of the economy and to re-assert its strategy, and not to (temporarily) suspend its strategy. Bletzinger and Wieland (2013, this eBook) shed light on the question of what "*an extended period of time*" means. Using a reaction function based on past choices of the ECB's Governing Council, they argue that the ECB should anticipate raising its key interest rates at the latest by May 2014.

5 See Shirai (2013, this eBook).

Does forward guidance affect expectations?

If forward guidance doesn't affect the public's expectations, then there seems little point in doing it. Is there empirical evidence that announcements by the central bank affect expectations?

Several papers address this question using pre-crisis routine forward guidance. The conclusion is that forward guidance does affect expectations, but the influence is limited, especially at longer horizons.[6] Goodhart (2013, this eBook) is especially sceptical and notes that "*the official path adjusts to market rates, rather than vice versa, (except at short horizons in Sweden when the relationship is two-way)*". Not everybody is this negative, but it is clear that expectations of the public do not move one for one with forecasts provided by central banks.

Gürkaynak, Sack, and Swanson (2005) is an often cited study that finds that FOMC statements contain information about the forward path of interest rates that is *not* related to the announced target value of the policy interest rate for the upcoming period. Building on this research, Campbell et al. (2012) find that those upward revisions in the forward path (i.e. those that are unrelated to changes in the current value of the policy interest rate) lower market participants' expectations of future unemployment rates and increase the expectations of inflation rates. This indicates that these anticipated increases in the policy interest rate provide information about the state of the economy. If the upward revisions would have signalled a tightening of monetary policy, then these expectations should have moved in opposite directions. This finding is important, since it implies that information on the future development of the policy interest rate can not only affect asset prices, but also affect the economic outlook more generally.

The efficacy of recently implemented forward guidance policies may be hampered by the fact that they stretch years into the future, as is pointed out by Williams (2013, this

6 See Moessner and Nelson (2008), Goodhart and Lim (2011), Goodhart and Rochet (2011), and Kool and Thornton (2012).

eBook). Woodford (2012) argues however, that these recent forward guidance policies may very well be more effective than routine forward guidance; whereas routine forward guidance just provided forecasts, recent forward guidance have an element of commitment or at least a promise. For example, the press release accompanying the Bank of Canada's forward guidance policy of 21 April 2009 included the phrase "*[the] Bank of Canada ... commits to*". Interestingly, even Delphic forward guidance seems to impose restrictions on the monetary policy committee. Mirkov and Natvik (2013) argue that the monetary policies of the Federal Reserve Bank of New Zealand and Norges Bank appear to be constrained by the most recently announced forecasts of the policy rate. Data limitations make it difficult to get an accurate estimate of the effect of recent forward guidance policies, but empirical studies seem to indicate that they do affect market expectations.[7] Campbell et al. (2012) conclude that "*communication difficulties do not present an insurmountable barrier to monetary policy based on Odyssian forward guidance.*"

Motivation for forward guidance

There are several reasons why a central bank may want to provide information on the forward path for its policy interest rate and/or for other instruments of monetary policy. First, consider potential motivation for forward guidance during 'normal' times when the central bank is not constrained by the effective lower bound on its policy interest rate.[8] Goodhart (2013, this eBook) points out that "*the central bank, supported by an array of expert modellers and with macro-economic and financial experts both among its staff and on its MPC/Executive Board, should be able to arrive at a better prediction of its own future actions in setting interest rates than anyone else. It would, therefore, represent a wilful withholding of useful information not to give such forecasts to the general public and the market.*" As discussed above, Campbell et al. (2012) point out

7 Woodford (2012) contains several very insightful descriptions of financial markets responses to recent forward guidance implementations. Also see Chahal and Trehan (2009), Gagnon et al. (2010), and Annette Vissing-Jorgensen (2011).

8 For reasons related to financial stability, central banks may not want to decrease interest rates to exactly zero. The effective lower bound may, thus, be slightly higher than zero.

that forward guidance also provides new information on the path of other economic variables such as the inflation and unemployment rates. Even if a forward path of the policy interest rate is not a very reliable predictor, then publishing such a path may still be useful in that combined with the central bank's other forecasts it provides information on the central bank's reaction function. That is, given the policymakers' view on the direction the economy is heading, the forward path reveals to the public what in their opinion the appropriate response would be.

The argument that forward guidance is important because it provides information about the central bank's reaction function, or more generally its strategy, is one that several central banks gave to motivate the recently implemented forward guidance policies.[9]

It makes sense that this argument is especially relevant during unusual and volatile periods when history is of little use in predicting monetary policy. Monetary policy has been extremely aggressive. Moreover, as pointed out by Miles (2013, this eBook) "*no one should want the Bank Rate to be virtually zero for any longer than needed*." At the beginning of the millennium, the Bank of Japan followed a start-stop policy and the lack of perseverance may have been important in the slow recovery.[10] Consequently, policymakers now stress their intent to follow through and try to convince the market that they are not about to get cold feet and withdraw too soon from following exceptionally accommodative monetary policy.

A problem with providing more detailed information on intended monetary policy during an unusual downturn is that central banks may not be quite sure what the best strategy is and that they learn about this as time progresses, which of course does not make it any easier to figure out what kind of forward guidance to give. But the contributions of central bank officials in this eBook make clear that monetary policymakers are sure enough about the monetary strategy they intend to follow so that a lack of knowledge on the part of the public about that strategy should be reduced.

9 See, for example, Dudley (2013), Dale and Talbot (2013, this eBook), and Praet (2013, this eBook).
10 See Kazuo (2013, this eBook).

Sheard (2013, this eBook) points out that there may be a downside risk to the central bank providing information.[11] If market participants take forward guidance seriously, but react to the headline and not the nuanced message, then "*the market's reaction to a communication surprise is prone to be amplified by the fact that market participants react at the same time and, because it is a surprise, likely mainly in the same direction*." Similarly, Williams (2013, this eBook) points out that the Federal Reserve wants to "*avoid the public substituting independent thought with an attempt to read the Fed tealeaves*".

Another argument in favour of forward guidance that policymakers have put forward is that forward guidance reduces the sensitivity of money market forward rates at various horizons to news and data surprises.[12] Asset markets may respond stronger, however, to changes in those variables that are part of the state-contingent forward guidance policy of the central bank, such as the unemployment and inflation rates in the policies of the UK and the US.

Forward guidance and monetary stimulus

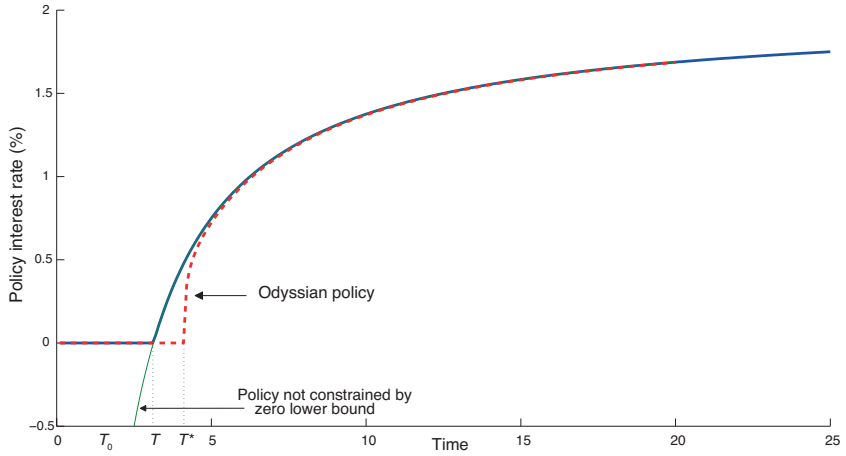
Although central banks have kept policy interest rates at historically low levels for a sustained uninterrupted period and have relied on aggressive quantitative easing, economic growth is low, unemployment is still a substantial problem, and inflation rates are, at most, slightly above usual target levels. This would suggest that additional monetary stimulus would be wanted. Could forward guidance provide such additional stimulus?

11 Lepetyuk and Stoltenberg (2013) develop a model in which revelation of information by the central bank may be detrimental for welfare, because it distorts agents' insurance incentives and may make it more difficult to insure against idiosyncratic risk.

12 For example, Benoît Cœuré, member of the executive board of the ECB makes this argument in Cœuré (2013). Empirical evidence is given in Swanson and Williams (2012).

In theory the answer is yes. To understand why, consider Figure 1, which plots alternative forward paths for the policy interest rate for an economy that is expected to gradually recover.

Figure 1 Alternative forward paths



The solid line displays the path the policy rate would follow according to the central bank's reaction function that characterises the central banks 'normal' strategy, that is, the strategy without forward guidance. T_0 is the current period. In period $T>T_0$, the economy has recovered to the extent that the bank's reaction function no longer calls for a negative policy interest rate. In period T_0, the policy interest rate is equal to zero and the central bank cannot reduce this rate any further. But if the bank could lower the expected values of future (strictly positive) interest rates, then this would put downward pressure on long-term rates in the current period, which in turn would stimulate purchases of durables and investment. The central bank can accomplish this by promising to keep the policy interest rate "lower for longer". This corresponding time path is the dashed line in Figure 1. More specifically, the policy interest rate remains at zero until $T^*>T$ and then quickly catches up with the bank's standard reaction function. It is simple and elegant. However, there is a problem. From period T to period T^*, the bank's normal reaction function calls for a positive interest rate, whereas the bank had promised to

keep the interest rate at zero during this period. The bank clearly has an incentive to break its promise. After all, at this point in time, it is better for the economy to have a positive policy interest rate and in the terminology of Krugman (1998) it would be 'irresponsible' not to do so. Such a policy is called a time-inconsistent policy. But if the public is smart enough to see this coming, then expectations of future policy interest rates are not adjusted downward and neither are long-term rates. For this forward guidance policy to be effective, the central bank would have to make the market believe that, like Odysseus tied to the mast, it has no way to change course.

Does this story have any relevance for the recently proposed forward guidance policies? First, consider the ECB. Peter Praet, a member of the ECB's executive board, writes in his contribution to this eBook that "*Our purpose was not to communicate a suspension – even temporarily – of our strategy. Quite the opposite: it was a sharp and definite pronouncement to reassert it*." The ECB's motivation for forward guidance is that the market apparently thought that the ECB's reaction function was above the solid line in Figure 1, which displays the path according to the unchanged ECB monetary policy strategy.

John Williams, president and CEO of the San Francesco Federal Reserve Bank, expresses a similar view in his contribution to this eBook when he writes that "*the communication [i.e. forward guidance] allowed us to bring public expectations into closer alignment with Fed thinking. As a result, longer-term interest rates fell by 10 to 20 basis points – a significant drop*". In Williams (2013), he points out that forward guidance is an alternative way "*to ease financial conditions and thereby stimulate economic growth and job creation*". Is the additional stimulus only created by making the public understand better what the Fed had been doing, or is the additional stimulus also generated by telling the public that takeoff will occur at a date that is later than what is predicted by the usual Fed reaction function? Buiter (2013) argues that the FOMC statement regarding forward guidance given above makes clear that the Fed has de facto increased its inflation target by 50 basis points, which would indicate that there has been a change in the Fed's reaction function.

Whether the forward guidance policy of the Bank of England contains this type of Odyssian element is more difficult to determine. Spencer Dale, chief economist and member of the Bank's Monetary Policy Committee, and James Talbot, head of the Bank's Monetary Assessment and Strategy Division, write in Dale and Talbot (2013, this eBook) that "*[i]t [forward guidance] is not an attempt to inject additional stimulus by pre-committing to a 'lower for longer' policy with the aim of pushing inflation above target for a period; raising inflation expectations and reducing real interest rates.*" Charlie Bean, Deputy Governor for Monetary Policy, gives in Bean (2013) the following reason why such a policy would not be possible for the Bank of England: "*While such a time-inconsistent policy may be desirable in theory, in an individualistic committee like ours, with a regular turnover of members, it is not possible to implement a mechanism that would credibly bind future members in the manner required*." The delayed tapering of asset purchases by the Federal Reserve seems to prove that Charlie Bean is right.

In Plosser (2013), Charles Plosser, president of the Federal Reserve Bank of Philadelphia, writes: "*To delay tapering of our current asset purchase scheme without clear and significant departures from prior guidelines suggested the FOMC was changing the goalposts and deviating from June's forward guidance. This undermines the credibility of the Committee and reduces the effectiveness of forward guidance as a policy tool. To delay tapering of our current asset purchase scheme without clear and significant departures from prior guidelines suggested the FOMC was changing the goalposts and deviating from June's forward guidance. This undermines the credibility of the Committee and reduces the effectiveness of forward guidance as a policy tool*." The view of the Bank of England's MPC, thus, seems unambiguous and backed up by good sense.

But there are other statements to consider. Dale and Talbot (2013, this eBook) write "*… explicit forward guidance can provide greater clarity about the MPC's view of the appropriate trade-off between the horizon over which inflation is returned to the target and the support provided to output and employment*. " and "*… when faced with adverse supply shocks, the Committee should vary the pace at which inflation is returned to the*

target so as to avoid generating undue volatility in output." But how is a reduction in the pace at which inflation is returned to the target different from the time-inconsistent change in the reaction function discussed above?[13] Isn't promising a slower pace the same as promising a lower policy rate for longer?[14] If even the intended speed towards target has not changed, then the question arises how the MPC can explore 'the scope for economic expansion' within the framework provided by forward guidance.

Also, the statement made in Dale and Talbot (2013, this eBook) that 'forward guidance should enhance the effectiveness of monetary stimulus' could be interpreted to mean 'more stimulus'.[15]

There are arguments, however, backing up the view that the newly adopted forward guidance policy has not changed the reaction function of the Bank of England, at least not relative to the reaction function describing the Bank's choices in recent years. The first is that the inflation rate has been above 3% for half of the time since 2007.[16] This could indicate that the MPC had not been very aggressive about the return of inflation to the inflation target before forward guidance was adopted either. More explicit evidence that getting inflation back to target quickly had already become less important is given in Bank of England (2013) in which it is stated that "*in the February 2013 inflation report the MPC said that in response to the cost shocks hitting the economy, it intended to return inflation to the target more slowly than it had anticipated at the time of the November 2012 Inflation Report.*" Also, the fact that long-term rates increased when the Bank of England's forward guidance was revealed could suggest that the market had expected a real change in the Bank's reaction function towards a more accommodative monetary policy, but adjusted their expectations when they learned that the announced

13 Buiter (2013) goes further and argues that "[t]*he Bank of England, which notionally still has a mandate that is lexicographic with price stability in pole position, has* de facto *adopted a dual mandate that treats inflation and the output gap or unemployment symmetrically a form of flexible inflation targeting*."

14 Of course, the question arises whether the argument put forward by Charlie Bean that the current MPC members cannot credibly bind future MPC members does not apply to this slower pace. In particular, wouldn't it be optimal to ignore the earlier intention to slow down the pace towards the inflation target if the economic activity takes off and inflationary pressures build up?

15 See, for example, Yates (2013).

16 See Bank of England (2013).

forward guidance policy did not indicate a substantial change in policy compared to MPC policy choices in the recent past.[17]

Finally, it is not impossible that forward guidance makes monetary stimulus more powerful, and is thus more effective, without the MPC injecting any additional stimulus and without a change in the MPC's reaction function. If forward guidance will prevent the public from forming forecasts about future values of Bank Rate that *exceed* what the MPC intends to do, then the *same* accommodative path of Bank Rate will have a stronger expansionary effect on the economy. There is another reason why forward guidance could generate more stimulus without pursuing a more accommodating monetary policy. With the statement "*The inflation target applies at all times*" and other such strong statements, the MPC makes it clear that its members remain quite serious about getting any inflation back to target (at a reasonable pace) and that with respect to inflation, they are not taking any risks. Especially since the inflation rate has been above target repeatedly in the last couple years, the MPC may have felt the need to reconfirm its commitment. If this communication is successful, then it could reduce uncertainty about future inflation rates, which in turn could lower the spread on long-term bonds and thus stimulate the economy. This shows that a central bank could inject stimulus now by being *less* accommodative in the future. This strategy could backfire if expected inflation rates are also adjusted downward for the near future when short-term nominal interest rates are still low. The reason is that this would cause real interest rates to increase which would slow down the economy.

The forward guidance of the Bank of Japan is not hampered by possible time-inconsistent policies. The other banks are affected by this problem, because the (Odyssian) forward guidance policies try to stimulate growth *now* and to 'pay' for this extra growth *later* by more future inflation. The problem is that they may be tempted not to pay. The forward

17 An alternative explanation is that markets expect interest rates to rise earlier than the Bank of England does, because they expect the unemployment rate to reach 7% sooner than the Bank of England does. This explanation is not that convincing, since long-term rates went up only slightly following the announcement of the Bank's forward guidance policy. The subsequent more substantial increase in long-term rates seemed to have been driven by an increase in US rates.

guidance policy of the Bank of Japan does not focus on unemployment or economic growth. Instead, it aims to create inflationary pressure now by stressing that they are serious about sticking to their normal strategy of having an inflation rate above what inflation currently is. That is, they will be keen to 'pay'.

Forward guidance and price stability

If the policy rate is at the effective lower bound, then the nominal rate cannot go any lower. But the real rate could be reduced if inflation would increase. As discussed above, at least some of the recently implemented forward guidance policies are of an accommodative or expansionary nature. Central banks being a bit more lenient on inflationary pressure could harm central banks' reputation as being conservative on inflation.[18] Bianchi and Melosi (2013, this eBook) argue that once central banks have established a good reputation as inflation fighters, then this reputation is quite persistent. This is good news. Nevertheless, these days central banks are not taking risks and they have accompanied their forward guidance policies with statements and conditions making very clear that low expected inflation is still a cornerstone of monetary policy even in unusual times, although they seem to allow for a bit more inflationary pressure when they say that inflation is allowed to return to target at a slower pace (Bank of England) or when they say that the expected inflation rate may be a bit more above the usual target (Federal Reserve).

Forward guidance going forward

This eBook is intended as part of an ongoing effort to understand and refine forward guidance. The recovery of the Canadian economy following the adoption of forward guidance by the Bank of Canada in mid-2009 raised hopes that forward guidance is a powerful tool to kick-start the economy. It is too early to tell, however, whether forward

18 Since Japan's problem is that inflation is too low, both their short-run forward guidance policy and their long-run policy call for an inflation rate that is above the current inflation rate.

guidance is effective in stimulating growth and if so what type of forward guidance is best. Nevertheless, the contributions in this eBook highlight several key lessons about forward guidance and its role for monetary policy:

- A recurrent problem facing central banks throughout this crisis is that the public expects a loosening of monetary policy to take place earlier than monetary policymakers. Although forward guidance has been shown to affect markets' expectations to some extent, not a single implementation of forward guidance has managed to closely align market expectations with policymakers' intentions. At least not yet.

- Forward guidance aimed at stimulating growth creates a tension between this short-term objective and the central bank's objective of low and stable inflation rates. Through statements and speeches, policymakers emphasise that their inflation objectives are still in place, but this could reduce the effectiveness of forward guidance in lifting a struggling economy to sustained growth.

- Economic theory predicts that a forward guidance policy that commits to keeping the policy rate 'lower for longer' than what is prescribed by the normal central bank's policy can generate substantial growth. Several policy makers – although not all – explicitly argue that this element is not part of their forward guidance policy. Without such a 'lower for longer' element, it is more difficult to see how forward guidance can stimulate growth, except when it reduces market expectations about the forward path of policy interest rates, which in turn would put downward pressure on long-term rates (as mentioned in the first bullet point above).

- Communication of monetary policy is never easy. This is especially true for new policies like forward guidance. Even when policymakers carefully craft forward guidance policies with escape clauses and guarantees about inflation targets, there is no guarantee that the nuance will not be missed by the public. Consequently, a policy that is not meant to be a 'lower for longer' policy can still be interpreted by the market as a 'lower for longer' policy. If this leads to additional borrowing with

interest payment obligations that will become problematic when interest rates do rise, then central bank's credibility may be negatively affected.

- Forward guidance may be beneficial even if it doesn't fundamentally affect anything. Forward guidance may signal to the world that central banks will leave no stone unturned and it is this continued search for solutions and central bankers' perseverance that will prevent our hopes from collapsing and will prevent the economy from becoming stuck in the kind of self-fulfilling trap of low growth that David Miles describes in his contribution to this eBook.

The best time for forward guidance may lie in the future. Central banks' balance sheets have ballooned and there is a lot of uncertainty about the question of when and at what pace these balances are going to be unwinded. The recent sharp market reactions to announcements by the FOMC on when to start tapering off asset sales have made it clear that this process is not without risks. Providing guidance on how central banks will proceed in doing so may be crucial in completing this process without severe disruptions. Barwell and Chadha argue in their contribution to this eBook that central banks should already provide guidance on what monetary policies will look like after takeoff of the policy interest rate from the effective lower bound. The Federal Reserve already does this four times a year. Last month, it reported individual forecasts of FOMC participants for the target federal funds rate for 2014, 2015, 2016, and the 'longer run'. As the day of takeoff comes closer (and hopefully this will be sooner than later), then providing information on the path towards normalised monetary policy could become very useful and central banks will have to consider seriously if - and if so, how – they would do this.

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Part I

Central Bankers on Forward Guidance: Description and Motivation

Forward Guidance and the ECB

Peter Praet
European Central Bank

The ECB recently changed its monetary policy communication strategy to include a form of forward guidance. This chapter explains the new thinking and argues that it has contributed to more clarity over the ECB's assessment of the outlook and its reaction function as well as helping to stabilise money-market conditions and anchor expectations more firmly.

The Introductory Statement to the Press Conference following the ECB's Governing Council meeting of 4 July contained the following two sentences:

> The Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time. This expectation is based on the overall subdued outlook for inflation extending into the medium term, given the broad-based weakness in the real economy and subdued monetary dynamics.

This statement, in particular the formulation "for an extended period of time", marks a change in the ECB's communication of monetary policy. It is a form of f*orward guidance*, a communication instrument by which central banks convey their monetary policy orientation going forward, conditional on their assessment of the economic outlook.

The standard view is that monetary policy influences the economy and, ultimately, price setting primarily by affecting interest rates at intermediate and medium-term maturities. Indeed, longer-term interest rates determine the borrowing conditions that are most relevant for a large component of aggregate spending: first and foremost, durable consumption and investment. The expectations theory of the term structure of interest rates suggests that longer-term interest rates reflect the expected path of the very short-term interest rates which the central bank controls. This is because trading in financial

markets removes persisting arbitrage opportunities across securities with similar risk characteristics and different maturities. As a consequence, returns are equalised across the term structure, except for premia that remunerate investors holding relatively longer term securities. Therefore, it is not so much by changing their very short-term interest rate instruments that central banks can impact the decisions that matter most for the economy. It is rather by influencing expectations about the evolution of those short-term interest rates in the predictable future.

When a central bank changes its short-term interest rate, interest rates at intermediate to medium-term maturities tend to shift in the same direction, if there is a signal that the new level of the short-term interest rate is likely to persist.[1] In general, this puts a premium on the way central banks communicate about, or at least are perceived to reveal their policy orientation.

Is there evidence supporting the contention that central banks' perceived orientation is as important as their actions? Answering this question is difficult. First, when a central bank communicates a decision, it is difficult to disentangle the impact on market rates which can be associated to its immediate decision to change its policy instrument from the effect that its action may exert via signalling and expectations of future policy. Second, there is of course no obvious counterfactual against which any impact can evaluated. And the term structure of interest rates always also reflects news and expectations that are not related to monetary policy. Subject to all these caveats, evidence indeed supports the view that the way in which a central bank communicates decisions is perhaps as important as the decision itself. For example, using an event study methodology and high-frequency data around official communications, Gürkaynak et al. (2005) show that the impact of Fed monetary policy works through two distinct channels, the signalling one being very effective in influencing expectations and the yield curve. Brand et al. (2010) tend to reach similar conclusions using euro area data.

1 For an exposition of this standard view, see for example Woodford (2003) or, for a focused discussion of central bank communication in this context, see Blinder et al. (2008).

But, how do economic actors form their expectations about future policy? The simple answer is: by trying to gain an understanding about the way the central bank *systematically* responds to economic developments. Indeed, monetary policy decisions are not isolated, ad hoc reactions to ever new constellations of circumstances. Instead, they tend to display a recognisable pattern. This pattern is a reflection of a *strategy* by which a central bank – faced with ever new shocks – modifies monetary conditions so as to bring the economy back to a steady path of price stability and balanced growth.

In light of this mechanism, the expectations channel by which economic actors anticipate the path of future policy consists of two interlinked parts. The first part is an interpretation by economic actors of the strategy governing central bank actions in response to economic conditions. The second part is related to their perceptions about the central bank's present assessment of current and future economic conditions.[2]

A taxonomy

Not surprisingly, forward guidance – a form of advance communication about future policy orientations – intervenes on both components of the expectations channel. In modern parlance, one could say that forward guidance has both an Odyssean and a Delphic element in it (this evocative taxonomy has been proposed in a recent paper by Campbell et al, 2012).

The *Odyssean* element has to do with the central bank's disclosure or clarification of its monetary policy strategy. In contemporary quantitative economics terms, one could say: through the Odyssean element of forward guidance, the central bank communicates the parameters of its reaction function and its policy goals. It is Odyssean to the extent that a reaction function, or a *strategy*, is a reflection of the central bank's mandate and statutes, and therefore is binding for central bank actions. Not unlike Odysseus who tied himself to the mast of his vessel to resist temptations, by anchoring itself to a

2 There are some intermediate steps missing in this simple view. A description of the (likely) transmission of monetary policy via the real and, importantly, the financial sector is outside the scope of this text.

strategy a central bank commits to never lose sight of its general purpose as spelled out in its mandate and statutes.

Through its *Delphic* element, forward guidance gives information about the central bank's perceptions of macroeconomic fundamentals. Like the utterings of the Delphic oracle, such communication reveals expectations of future events, given the current state of knowledge. To the extent that the future course of monetary policy is motivated by the underlying path of the economy, and is contingent on the direction that the economy is expected to take, the Delphic component of forward guidance discloses a conditional expected path of policy. In fact, the conditionality of forward guidance statements by central banks is mainly an implication of their Delphic element.

Two examples of forward guidance

In one way or another, various forms of indications – more Delphic in nature – about the conditional direction of policy have implicitly been part of central bank communication for a while, increasingly so since the mid of the 1990s. Around that time, a small number of central banks pioneered the publication of numerical forecasts for the future path of their policy rates. For example, since 1997, the Reserve Bank of New Zealand (RBNZ) has provided a numerical projection of future policy rates. In 2005 the Norges Bank took such explicit forward guidance a step further by communicating not only a forecast of the short-term interest rate path, but also a confidence interval around it. These two – and many other – examples of explicit forward guidance, once more, underscore the importance of conditionality. By stressing that the forward guidance is a forecast based on current information, and consistent with the central bank's broad-based projections about the underlying economic conditions looking forward, there is no commitment to future actions. When new information is available, the forecast is updated. This point is reinforced by publishing the confidence intervals, i.e., the probability distribution over possible future interest rates.

More recently, forms of forward guidance with a distinct (and extreme) Odyssean character have gained some prominence in the academic debate over monetary policy in a very low interest rate environment. Here, the main idea is the following: when the central bank is constrained in its capacity to reduce the short-term interest rate further by the lower bound on nominal rates, it could resort to communication about its intention to keep the short-term interest rate at the current level for some time in the future. This would help steer expectations in the desired direction, and thereby exert downward pressure on longer-term interest rates. It is therefore an indirect channel to engineer an easing of credit conditions, broadly defined, even though the level of the short-term interest rate remains constant. Eggertsson and Woodford (2003), among others, go as far as suggesting that a promise by the central bank to maintain a zero interest rate policy for some time in the future, and even in the face of conditions that would otherwise dictate a firming of the stance, would be a powerful instrument to stimulate the economy already at present. In this line of thinking, forward guidance is a communication campaign by which a central bank advertises its intention to depart from its usual strategy, if only temporarily. It is a promise to suspend its strategy and become "irresponsible", as in Krugman (1998), meaning: unreactive to the cyclical conditions – at some point in the future, when the cycle will turn, inflation will start rising and the usual pattern of central bank reaction would dictate a resolute firming of the stance. Its promise not to follow that usual pattern of reaction will be painful to fulfil, when that time comes, because the central bank will have to watch inflation rising while remaining atypically passive. But that promise has a value today, as it generates optimistic expectations, supports spending and thus facilitates the central bank's job at present.[3]

3 One way to signal commitment is to purchase long-term bonds (see Clouse et al., 2000). More recently, Woodford (2012) discusses refinements to his version of forward guidance, by which the central bank would adopt targets for expected inflation over the medium term.

The ECB's forward guidance

As I wrote at the start, the ECB Governing Council has recently provided forward guidance, and the Federal Reserve and other major central banks have done so before on various occasions. What interpretation should one assign to it in current circumstances?

To be sure, our forward guidance does not promise irresponsibility! Our purpose was *not* to communicate a suspension – even temporarily – of our strategy. Quite the opposite: it was a sharp and definite pronouncement to reassert it. Why did we feel it was necessary to reassert our strategy? Because, starting in May and with increased intensity in the month of June, we perceived that expectations regarding the stance of monetary policy and its evolution had become somehow detached from our assessment of the state of the economy and our monetary policy inclinations, given that assessment. A sustained upward trend in money market interest rates had led to a restriction in money market credit conditions, so that a large portion of the amount of monetary accommodation that we had introduced in early May had been de facto withdrawn.

This called for a clarification of our assessment and a more precise description of our strategy. So, the ECB's formulation of forward guidance includes a Delphic component clarifying the assessment, and an Odyssean element reasserting the strategy.

It is Delphic because it is clearly conditional on the Governing Council's current assessment of the outlook for price stability. The Governing Council believes that the ECB interest rates will remain at current or lower levels for "an extended period of time" *because* it anticipates that economic conditions will remain such as to justify an exceptional degree of monetary accommodation over the same horizon (that is, for as long as it is meaningful today for the Governing Council to project future economic developments on the basis of current information). Such economic conditions can be described by an overall subdued outlook for inflation expected to extend into the medium term, and associated with broad-based weakness in the real economy and subdued monetary dynamics. The cross-checking of the inflation outlook through

monetary indicators is particularly important. Optimal monetary policy in response to a given inflation outlook depends on the shocks that drive inflation. Monetary developments help identify these underlying shocks explaining inflation in the medium term. In this way, monetary developments support a correct calibration of monetary policy. In current conditions, the underlying weakness in monetary dynamics – slow growth of broad monetary aggregates and very weak credit – suggests that inflation pressures, beyond the ups and downs of short-term price adjustments, will likely remain subdued for an extended period of time.

Some Odyssean elements are evident as well in the ECB's statement. But, again, in the following sense: with forward guidance the Governing Council has meant to re-assert – not to suspend – its strategy. We have clarified how our strategy is going to guide us in the difficult conditions that we expect to prevail going forward. We will be guided by two elements of our strategy, in particular. First, our primary objective. By its objective, the ECB is mandated to the pursuit of a positive inflation rate below 2%. In accordance with our strategy, this means aiming for inflation rates below but close to 2% over the medium term. The 4 July forward guidance is an expression of commitment to this objective and of determination to apply the policy prescriptions which descend from it. The second element of our strategy which will give us a sense of direction is the strategy's binary analytical framework. As I said, inflation and the economy need to be interpreted: falling inflation in conditions of surging productivity and a booming economy is not bad news. Falling inflation when aggregate demand is persistently dragging, and credit and money are consistently unsupportive of households' consumption and firms' investment can be a problem for a central bank that is devoted to price stability. The monetary part of our analysis is there – in our forward guidance formulation – to robustify our assessment of the inflation outlook and convey the appropriate monetary policy implications that derive from that assessment according to our strategy.

Against the conditions that we see prevailing over a meaningful horizon, our guidance includes an easing bias. This conveys the notion that we have not reached the lower

bound on our key interest rates. We have not run out of ammunition. Further cuts in policy rates remain an option for the ECB if the outlook on price stability so warrants.

The ECB's forward guidance has contributed to more clarity over our assessment of the outlook and our reaction function. Our forward guidance has contributed to more stable money market conditions and has helped to anchor market expectations more firmly. It also ensures that our monetary policy stance is not excessively vulnerable to shocks that are disconnected from the underlying economic and monetary conditions in the euro area.

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Forward Guidance in the UK

Spencer Dale and **James Talbot**
Bank of England

The Bank of England's Monetary Policy Committee has recently provided some explicit forward guidance regarding the future conduct of monetary policy in the UK. This chapter explains how the MPC designed its forward guidance to respond to the unprecedented challenges facing the UK economy and argues that forward guidance allows the MPC to explore the scope for economic expansion without putting price and financial stability at risk.

At its meeting on 1 August 2013, the Monetary Policy Committee (MPC) agreed to provide state-contingent forward guidance concerning the future conduct of monetary policy. The aim was to provide more information to help financial markets, households and businesses understand the conditions under which the current stance of monetary policy would be maintained. In essence, the MPC judged that it would be appropriate to maintain the current exceptionally stimulative monetary stance until the margin of slack within the economy had narrowed significantly, provided that such an approach remained consistent with its primary objective of price stability and did not endanger financial stability.

In particular, the MPC outlined its intention neither to raise Bank Rate from its current level of 0.5% nor reduce the stock of asset purchases financed by the issuance of central bank reserves at least until the unemployment rate has fallen to a threshold of 7%.

The guidance linking Bank Rate and asset sales to the unemployment threshold would cease to hold if any of the following three 'knockouts' were breached:[1]

- In the MPC's view, it is more likely than not, that CPI inflation 18-24 months ahead will be 0.5pp or more above its 2% target.

1 See Monetary Policy Committee (2013) for more details.

- Medium-term inflation expectations no longer remain sufficiently well anchored.
- The Financial Policy Committee (FPC) judges that the stance of monetary policy poses a significant threat to financial stability that cannot be contained by regulatory actions.

As noted by Bean (2013), the primary aim of the MPC's forward guidance is to clarify its reaction function and thus make its current policy setting more effective. It is not an attempt to inject additional stimulus by pre-committing to a 'lower for longer' policy with the aim of pushing inflation above target for a period; raising inflation expectations and reducing real interest rates, such as that described by Woodford (2012). That is for two reasons. First, UK inflation has been above, rather than below, its 2% target for much of the period since 2007. Second, even if such a strategy were to be successful in boosting economic growth, there is no mechanism by which existing MPC members can pre-commit future Committee members to such a strategy.

The MPC believes its forward guidance should enhance the effectiveness of monetary stimulus in three ways. First, it provides greater clarity about the MPC's view of the appropriate trade-off between the horizon over which inflation is returned to the target and the speed with which output and employment recover. Second, it reduces uncertainty about the future path of monetary policy as the economy recovers. And third, it better enables the MPC to explore the scope for economic expansion without putting price and financial stability at risk.

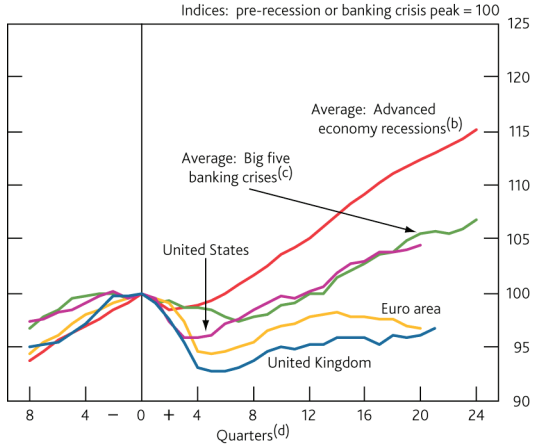
What are the challenges facing the UK economy?

The MPC's adoption of explicit forward guidance was motivated by the exceptional challenges facing the UK economy. Over the past six years, the UK economy has faced substantial demand and supply shocks. As a consequence, UK output growth has been weak compared with both previous recoveries and current recoveries in other countries (Figure 1): in 2013 Q2, UK real GDP was still more than 3% below its pre-crisis peak.

The unemployment rate, at just a little below 8%, is around three percentage points higher than its average in the decade before the crisis.

This anaemic recovery has been accompanied by significant uncertainty regarding the evolution of the supply capacity of the UK economy. A period of weak output growth would normally be expected to result in a large margin of spare capacity. But business surveys suggest that spare capacity within companies has actually narrowed since 2009 (Figure 2), labour productivity has fallen back to 2005 levels, and domestic inflationary pressure has been stronger than expected. All of these factors are suggestive of a substantial weakening in supply capacity. But it is unclear how much of this weakness is directly related to demand and how much reflects other factors, such as problems in the banking sector. Consequently, a key uncertainty faced by the MPC currently is how productivity and supply will evolve as demand recovers.

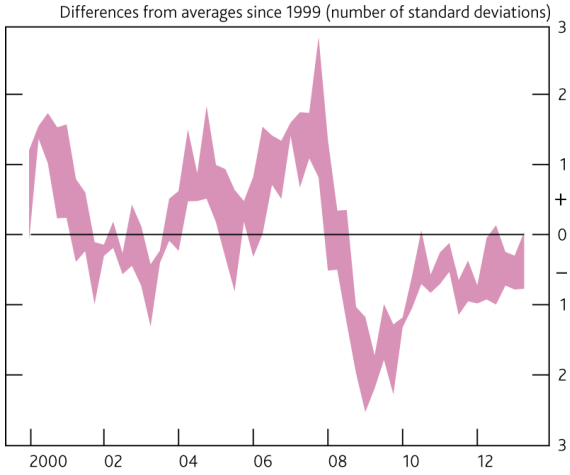
Figure 1 Evolution of GDP around recessions(a) and banking crises



Sources: OECD, Reinhart, C.M and Rogoff, K.S (2008), Thomson Reuters Datastream and Bank calculations.

Notes: (a) Defined as at least two consecutive quarters of falling output. (b) Where data are available, covers the G20 advanced economies over the period from 1960 to 2006. (c) Spain (1977), Norway (1987) Finland (1991), Sweden (1991) and Japan (1992), as defined in Reinhart, C.M and Rogoff, K.S (2008) 'This time is different. Eight centuries of financial folly'. (d) Zero denotes the pre-recession peak in GDP, or the peak in GDP during the year of the banking crisis, as listed in footnote (c).

Figure 2 Survey indicators of capacity utilisation(a)



Sources: Bank of England, BCC, CBI, CBI/PwC and ONS.

Notes: (a) Three measures are produced by weighting together surveys from the Bank's Agents (manufacturing and services), the BCC (non-services and services) and the CBI (manufacturing, financial services, business/consumer services and distributive trades) using nominal shares in value added. The BCC data are non seasonally adjusted.

How does forward guidance help in these circumstances?

The MPC's primary objective, as set by the Government, is to deliver price stability. The MPC's remit also recognises that, when faced with adverse supply shocks, the Committee should vary the pace at which inflation is returned to the target so as to avoid generating undue volatility in output.

At the current juncture, with both inflation and economic activity far from desirable levels, explicit forward guidance can provide greater clarity about the MPC's view of the appropriate trade-off between the horizon over which inflation is returned to the target and the support provided to output and employment. That greater clarity should help individuals to make better-informed expectations about future interest rates, which in turn influence households' and businesses' spending and saving decisions.

Moreover, as the UK recovery begins to gain traction, providing explicit guidance about the future path of monetary policy might be especially useful. In particular, there is a

risk that households, businesses and financial market participants overreact to signs of a recovery, either in the UK, or in other countries where the economic recovery is more advanced. This might cause people to revise up excessively their expectations of the future path of Bank Rate, causing monetary conditions to tighten and so hindering the emerging recovery. By tying its guidance to the unemployment rate, the MPC has made clear that, even if a period of robust GDP growth appears likely, interest rates would be raised only if that were accompanied by a substantial decline in spare capacity in the labour market (subject to there being no material risks to either price or financial stability).

The scale of recent shocks, and the difficulty in knowing how effective supply will respond as demand picks up, means that the trade-off between the speed with which inflation is returned to the target and the scope for economic expansion is unusually uncertain. Attempting to return inflation to the target too quickly risks prolonging the period over which the nation's resources are underutilised, which, in turn, might also erode the medium-term supply capacity of the UK economy. But returning inflation to the target too slowly might cause people to question the MPC's commitment to keep inflation close to the target. Such a loss of credibility would make it more costly to keep inflation close to the target. Either outcome would lead to significant economic costs in the medium term.

In that context, forward guidance provides a robust framework within which the MPC can explore the scope for economic expansion without putting either price stability or financial stability at risk. If productivity were to recover more quickly than anticipated, unemployment would fall less rapidly, resulting in weaker inflationary pressure. In such circumstances, the MPC's guidance implies that the accommodative stance of policy would be maintained for a longer time period. But if unemployment fell more rapidly and inflationary pressures began to emerge, the MPC's guidance – including the price stability knockouts – would point to a faster withdrawal of policy stimulus.

What design considerations were important for the UK?

Given the uncertainty surrounding the evolution of supply, the MPC judged that the unemployment rate was the most suitable indicator of economic activity to guide its policy. In particular, it seems likely that, as demand recovers, some of the spare capacity within companies will decline before, or at the same time as, the unemployment rate falls and slack within the labour market narrows. As such, by linking the path of Bank Rate to the evolution of unemployment, the MPC can set policy in order to reduce the degree of spare capacity in the economy, even if there is considerable uncertainty over the extent to which productivity will pick up as the recovery gathers pace.[2]

The MPC have set the unemployment rate 'threshold' at 7%: lower than the current unemployment rate of 7.7%, but somewhat higher than Bank of England estimates of the medium-term equilibrium rate (6.5%).[3] 7% is not a target for unemployment, nor is it a trigger for immediate monetary action (indeed, it is likely that unemployment will eventually fall below that level). Instead, as noted by Carney (2013), it represents an appropriate point at which the MPC will reassess the state of the economy – taking account of a wide range of measures of economic slack and inflationary pressures – and consider whether or not it should start to withdraw the current extraordinary levels of monetary stimulus.

Price stability remains the MPC's primary objective, and its policy guidance is conditional on two price-stability 'knockouts': one defined in terms of the MPC's inflation forecast and one in terms of external measures of inflation expectations.

CPI inflation is close to 3% and is expected to remain so for much of the rest of this year. By setting its inflation forecast knockout at 2.5% or more at the 18- to 24-month horizon, the MPC sought to strike an appropriate balance between not bringing inflation back to the target so quickly as to threaten the recovery, and not bringing it back so

2 Moreover, unemployment data are timely; not subject to substantial revision; and are well understood by both financial market participants and the general public.
3 See page 28-29 of the August 2013 Inflation Report for further details.

slowly as to cause people to question its determination to hit the 2% target over the medium term.

When assessing the inflation expectations knockout, the MPC will consider: the level of inflation expectations; movements in uncertainty about future inflation; and the sensitivity of inflation expectations to economic news.

The MPC's remit also recognises that attempts to keep inflation at the target could generate risks to future financial stability. The Financial Services Act 2012 established an independent Financial Policy Committee (FPC) at the Bank of England charged with identifying, monitoring and taking action to remove or reduce systemic risks with a view to protecting and enhancing the resilience of the UK financial system. One of the tasks of the FPC will be to alert the MPC publicly if the stance of monetary policy poses a significant threat to financial stability that cannot be contained by the substantial range of mitigating policy actions available to the UK regulatory authorities. That is because financial instability could have lasting effects on the economy, damaging growth and endangering price stability. In such circumstances, monetary policy may have an important role to play as a last line of defence in mitigating risks to financial stability.

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Forward Policy Guidance at the Federal Reserve

John C Williams
Federal Reserve Bank of San Francisco

The Federal Open Market Committee has used various forms of forward guidance to influence the views of businesses, investors and households about where monetary policy is likely to be headed. This chapter by the President of the San Francisco Fed presents his views on the benefits, limitations and future role of forward policy guidance.

In response to the financial crisis, the Federal Open Market Committee (FOMC) lowered the target federal funds rate to essentially zero in December 2008, where it has remained. The economy, however, was still reeling, and it wasn't possible to create additional monetary stimulus by cutting the federal funds rate further—owing to the inability of nominal interest rates to fall much below that point.

The FOMC therefore turned to "unconventional" monetary policies, including forward policy guidance. Through the use of forward guidance, the FOMC influences business and investor views about where monetary policy in general, and the federal funds rate in particular, is likely headed. This affects longer-term interest rates, as investors adjust their views on future short-term rates. In particular, we have used the Fed's communications tools—policy statements, FOMC participants' forecasts, press conferences, and speeches—to convey our expectation that short-term interest rates will remain low for some time.

The FOMC experimented with forward guidance in the past – in 2003 and 2004 – and made a renewed effort in December 2008, when the FOMC stated that it expected to keep the funds rate low "for some time." Although this qualitative forward guidance succeeded in influencing the public's expectations of future policy, nonetheless, public expectations often remained much tighter than the FOMC's own views. In fact, from

2009 to mid-2011, expectations from financial markets consistently showed the federal funds rate lifting off from zero within just a few quarters. This view persisted despite the efforts of many FOMC members to communicate the need for a sustained period of highly accommodative monetary policy, necessitated by the severity of the downturn and the slow recovery.

To push back against these excessively tight policy expectations, the FOMC shifted its forward guidance to make it more explicit. This occurred in the summer of 2011, offering a real-world example of the influence more assertive guidance can wield. At the time, many private-sector economists still believed that the federal funds rate would be raised within the year. By amending the language in its August statement – specifically, by writing that economic conditions were "likely to warrant exceptionally low levels for the federal funds rate at least through mid-2013" – the Fed was able to communicate its expectation that liftoff from zero would take at least two years. The communication allowed us to bring public expectations into closer alignment with Fed thinking. As a result, longer-term interest rates fell by 10 to 20 basis points – a significant drop.

In December of 2012, we introduced a new form of forward guidance. Instead of speaking in terms of dates on the calendar, we began to tie the path of monetary policy to economic variables such as the unemployment rate. Specifically, the statement read that the FOMC "currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6½ percent." This shift was undertaken with the intent of helping the public better understand the Fed's decision-making process in response to changes in economic conditions. The caveat being, of course, that the public should not infer that reaching the quoted unemployment level would spark an immediate policy change; hence the wording, "at least as long as." That is, this 6½ percent threshold is not an automatic trigger; it is merely a line of demarcation, after which we will reassess the most fitting course for the federal funds rate. For example, my own current projection – even though I expect the unemployment rate to fall below 6½ percent in early 2015 – is that it

won't be appropriate to raise the funds rate until well after that point is reached, likely sometime in the second half of 2015.

This leads me to another form of forward guidance, the FOMC participants' projections for coming years. Four times a year, FOMC participants submit their views on the appropriate future path of the federal funds rate, along with associated projections for economic growth, unemployment, and inflation. These projections are published on the Federal Reserve Board's web site. At our most recent meeting in September, a substantial majority of FOMC participants – 14 of 17 – expected that the first funds rate hike would take place in 2015 or later. After the initial hike, most predicted future rate increases would occur only gradually, with the median projection that the funds rate would rise to just 2 percent by the end of 2016.

Again, these projections improve public understanding of Fed thinking. In addition to helping people better predict how the Fed reacts to changes in economic conditions, establishing this range of projections reinforces that the future path of policy is determined not by a preset course, but by how economic events unfold. This helps reduce the uncertainty and confusion we've historically seen as a result of public misperceptions of Federal Reserve monetary policy.

While forward guidance brings with it a number of benefits, it is also necessary to acknowledge both its limitations and some potential drawbacks. First, efficacy depends on credibility. In severe downturns, the likes of which we have recently experienced, appropriate forward guidance can stretch years into the future. Public credulity may be tested by statements relating to events so far off, particularly when policy makers may be different than the ones making assertions today. Second, clearly communicating monetary policy and the associated data dependence is difficult to do well. Asset-price fluctuations over the past several months, sparked by Fed communications, demonstrate how hard it is to effectively convey FOMC policy plans in an evolving economic environment. Just as good communication can reduce confusion and enhance the effectiveness of monetary policy, poor communication can do the opposite. Third,

there is a danger of creating an over-reliance on Fed communication. While we want to convey our expectations and intentions, we want to avoid the public substituting independent thought with an attempt to read the Fed tealeaves.

Those issues notwithstanding, I expect that forward guidance will continue to play a central role in Federal Reserve policy in coming years. While the U.S. economy has been improving over the past four years, the unemployment rate stands at 7.3 percent, still substantially above its natural rate, which I estimate to be about 5½ percent. Additionally, inflation has been running persistently well below the Fed's preferred goal of 2 percent. Under these circumstances, monetary policy is appropriately very accommodative and will continue to be for quite some time. Of course, as the economy continues to strengthen, the unemployment rate drops, and inflation gets closer to our ideal level, the stance of monetary policy will need to be normalized.

Once that occurs, I see a continued role for some aspects of forward guidance. The introduction of FOMC policy projections reflects a shift toward greater transparency about the future of the federal funds rate. Coupled with the new emphasis on providing an economic basis for forward guidance, this should result in greater public understanding of Federal Reserve policy and the reasons driving policy decisions. This, in turn, should reduce households' and businesses' uncertainty and help them make better borrowing and investment decisions, ultimately making monetary policy more effective.

Author's note: The views presented in this article are the author's alone, and do not necessarily reflect those of other members of the Federal Reserve System.

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John C. Williams took office as President and Chief Executive Officer of the Federal Reserve Bank of San Francisco on March 1, 2011. In this role, he serves on the Federal Open Market Committee, bringing the Fed's Twelfth District's perspective to monetary policy discussions in Washington.

Dr. Williams was previously the executive vice president and director of research for the San Francisco bank, which he joined in 2002. He began his career in 1994 as an economist at the Board of Governors of the Federal Reserve System, following the completion of his Ph.D. in Economics at Stanford University.

Dr. Williams' research focuses on topics including: monetary policy under uncertainty; innovation; productivity, and business cycles. He has collaborated with economists from throughout the country and across the globe to examine economic and policy issues from different perspectives, and has published numerous articles in leading research journals.

Dr. Williams currently serves as the managing editor of the *International Journal of Central Banking*. Previously, he served as associate editor of the *American Economic Review*. Additionally, he served as senior economist at the White House Council of Economic Advisers and as a lecturer at Stanford University's Graduate School of Business.

The Bank of Japan's Current Monetary Easing and Forward Guidance[1]

Sayuri Shirai
Bank of Japan

The Bank of Japan's forward guidance constitutes an essential part of its recent aggressive monetary easing. There are the two targets for this forward guidance: to overcome deflation and change the overall deflationary mindsets, and to anchor the inflation expectations around 2%. This chapter discusses these targets and the role of forward guidance in achieving them.

Forward guidance is now a popular topic among the central banks of advanced economies. In general, it simply refers to a communication strategy aimed at providing future monetary policy information to the markets and the public. The Bank of Japan (BOJ) has also frequently employed such a communication strategy, although it does not officially use the term "forward guidance." In fact, the BOJ was the pioneer in using forward guidance as an accommodative monetary policy tool in the face of the zero lower bound. It initiated the practice as early as 1999 when the zero interest rate policy was adopted.

On April 4 2013, the BOJ introduced a very aggressive monetary easing called *quantitative and qualitative monetary easing* (QQE) with a strong determination to overcome deflation – which has prevailed in Japan for nearly 15 years since 1999 – and to achieve the 2% price stability target, adopted in January 2013 (Bank of Japan 2013). Forward guidance constitutes an essential element of the QQE and is a way to promote

1 Views expressed in this column are those of the author and do not necessarily reflect the consensus among the BOJ's Policy Board members.

a change in the deflation-oriented mindsets of the markets and the public, and to anchor their inflation expectations at around 2%.

The two sets of the forward guidance

The statement introducing the QQE was released on 4 April 2013 and contains the following two descriptions regarding the time span of monetary accommodation:

(1) The Bank will achieve the price stability target of 2% . . . at the earliest possible time, with a time horizon of about two years.

(2) The Bank will continue with QQE, aiming to achieve the price stability target of 2%, as long as it is necessary for maintaining that target in a stable manner. It will examine both upside and downside risks to economic activity and prices, and make adjustments as appropriate.

These two descriptions are closely connected to reinforce the credibility of the BOJ's commitment to achieving its 2% target. However, the relationship between these two descriptions is not necessarily well understood by the markets and the public. In essence, this unique structure of providing two sets of forward guidance is attributable to the BOJ's challenging tasks of:

- transforming the deflationary mindset; and
- increasing inflation expectations to anchor around the 2% level.

The 2% target: At the earliest possible time

The first set of forward guidance was positioned as the rationale for introducing "a new phase of monetary easing both in terms of quantity and quality." Its purpose was to signal to the markets and the public the BOJ's strong determination to achieve its 2% target, possibly within a time horizon of about two years, normally pursued by other central banks under the inflation targeting framework. The guidance combines

both calendar-based (i.e. about two years) and state-contingent (i.e. 2%) features. The calendar-based feature was considered to be essential to gain the confidence of the markets and the public in both the BOJ's intention and the possibility of achieving 2% at the earliest possible time. An improvement in confidence may accelerate the pace of increasing the medium- to long-term inflation expectations and may enhance the responsiveness of price changes to the output gap.

To implement this new policy, the BOJ decided to shift the main operating target for money market operations from the uncollateralised overnight call rate to the monetary base. Decisions were also made to double the monetary base and the amounts outstanding of Japanese government bonds (JGBs) and of exchange-traded funds (ETFs) in two years (by end-2014), as well as to more than double the average remaining maturity of JGB purchases (from less than three years to about seven years). On an annual basis, the monetary base will be increased by about 60-70 trillion yen, JGBs (including those with maturities of up to 40 years) by about 50 trillion yen, and ETFs by about 1 trillion yen. In addition, Japan's real estate investment trusts (J-REITs) will be purchased at an annual pace of about 30 billion yen over the same period.

The 2% target: In a stable manner

The second set of forward guidance was placed under the subheading "the continuation of QQE" in the mid part of the statement. It is a conditional commitment because the continuation of monetary easing is subject to the examination of upside and downside risk factors. It is also a state-contingent one, linking to the continuation of QQE, and plays a greater role than the first set of forward guidance in stabilizing medium- to long-term inflation expectations at around 2%.

The expression "in a stable manner" described in the second set of forward guidance may give the impression of a broad description of the conditions. However, this expression can be viewed as appropriate at present, because the formation of medium- to long-term inflation expectations entails uncertainty. This is especially true when the

BOJ attempts to raise inflation expectations and subjective judgment by the Policy Board members is unavoidable on whether medium- to long-term inflation expectations will be stabilized at around 2%, and when. Some measurement constraints also exist, including the following:

- There are no precise indicators measuring the inflation expectations of households and firms.
- Statistical bias is included in some survey data – for example, households' inflation expectations tend to be upward-biased in Japan, while the diffusion index for expected sales prices in the *Tankan* (Short-Term Economic Survey of Enterprises in Japan) tends to be downward-biased.
- In terms of market-based indicators, the impact of the BOJ's JGB purchases needs to be taken into account.
- The breakeven inflation rate indicator also reflects the differences in liquidity between fixed-rate and inflation-indexed bonds.

Nevertheless, as prices and economic activity firmly improve, and as the process of increasing inflation expectations becomes clearer, refining the second set of guidance with more specific information may become appropriate from a longer-term viewpoint.

How are the two related?

These two sets of forward guidance are not mutually exclusive, as the first set of guidance can be considered as the "necessary condition" for achieving the second, whereas the second set of forward guidance shows a strong commitment to continue QQE for as long as is necessary to achieve the 2% target in a stable manner. Therefore, while the time horizon of these two sets of guidance overlaps, the second set of guidance may imply a somewhat longer time horizon. In addition, the second set of guidance plays an

essential role in reducing volatility of long-term interest rates, and in preventing them from overshooting.

This second set of guidance warrants any necessary actions by the BOJ beyond the two-year horizon, if it judges it necessary to do so in light of achieving 2% in a stable manner. It also suggests that the BOJ will not consider an exit from monetary easing before this state-contingent guidance is achieved.

Differences between Japan and other advanced economies

There are two fundamental differences between the BOJ's current forward guidance and that adopted in other advanced economies. First and most importantly, major advanced economies, including the US and the UK, successfully anchored the medium- to long-term inflation expectations at around 2%. Therefore, the Federal Reserve and the Bank of England (BOE) focus on maintaining the anchored inflation expectations, whereas the BOJ focuses on increasing inflation expectations to around the 2% target and anchoring them there. This difference is reflected in the design of its forward guidance.

The second difference is that both the Federal Reserve and the BOE have adopted employment-related conditions in their forward guidance, whereas Japan has not. The Federal Reserve has a dual mandate of promoting price stability and maximum employment, so the reason for this is clear. The BOE places price stability as its primary mandate. However, the inclusion of employment-related conditions may reflect a need to clarify the BOE's views with regard to the existing trade-off between high inflation and low economic and employment growth.

In contrast, the BOJ's primary mandate, clearly stipulated in the Bank of Japan Act, is to achieve price stability. In addition, the current unemployment rate is not a significant issue in Japan. The figure for August 2013 was as low as 4.1%, with the lowest point in recent years being 3.6% in July 2007. Thus, it may not be relevant for Japan to consider introducing economic conditions related to employment. In general, nominal

wage rigidity is limited in Japan compared with the US and Europe, which partly explains why the unemployment rate remains low. The reason for this is that firms tend to flexibly adjust wages along the business cycle through active use of bonuses for full-time workers, and an adjustment of working hours and days for part-time workers. There are issues such as differential treatments of regular and non-regular workers, and greater flexibility over labour market regulations demanded by firms. However, these are structural issues that are beyond the scope of monetary policy.

Final remarks

QQE differs from the past practices in the following aspects:

- A greater emphasis on the expectations of the markets and the public over the future monetary policy stance.
- Recognition of the importance of their medium- to long-term inflation expectations.
- Larger-scale purchases of longer-term JGBs.

Reviewing the current and past forward guidance practices, it can be said that both the price stability objective and its relation with monetary policy conduct are clearer under QQE than in the past (Shirai 2013). Therefore, the effectiveness of QQE is likely to be greater than that of past practices, mainly through:

- exerting greater downward pressure on the entire yield curve;
- a stronger impact on the portfolio rebalance and wealth effects; and
- an indirect impact on the yen's exchange rate.

QQE is also likely to promote an increase in inflation expectations, thereby contributing to lowering long-term real interest rates.

Currently, actual prices have begun to increase, with the year-on-year rate of change in the consumer price index (CPI) for all items less fresh food, or the core CPI, registering

0.8% in August 2013. While this movement mainly reflects higher import prices, prices of a wide range of goods and services have also begun to show an increase. The CPI performance is expected to improve further, with the price increase contributions arising on the back of economic improvement and higher inflation expectations. While there is some room before reaching 2%, the BOJ's communication strategy will continue to play an essential role in accomplishing this goal.

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She has also published several books in Japanese on China's exchange crises, Japan's macroeconomic policy, ODA policy, and European sovereign debt crisis.

Monetary policy and forward guidance in the UK

David Miles
Bank of England

There has been a recent growth in economic activity and confidence in the UK. This chapter discusses forward guidance and its role in sustaining it. Growth in the economy is likely to bring unemployment down, and as long as inflation pressures are controlled, monetary policy is not likely to be tightened. Forward guidance helps the economy by ensuring the recovery is not smothered by anticipation of tightening in future monetary policy.

Room for optimism

For the first time in some years, the news over the past month or so on the outlook for economic activity in the UK has been overwhelmingly positive. Business surveys – of both current and future activity – look stronger and consistent with growth; at least as high as what we used to think of as normal. Consumer confidence has moved up sharply. Hardly any indicator has failed to improve. This is all encouraging and very welcome. It is likely that the rate of the growth of the economy right now is at – and quite possibly above – the average rate for the 50 years up to the onset of the financial crisis in 2007.[1] But this comes after a period of several years of virtually no growth, and those recent low growth years came after a disastrous period in 2009 when output plummeted. So it would be spectacularly misguided to think that some signs of more normal growth mean that the economy is back to normal. It would be equally misguided to think that if growth were to be near trend, monetary policy should be quickly returned to a more normal setting. There are two reasons for this:

1 The average rate of growth of GDP in the UK between 1955 and March 2007 was close to 2.8%.

- First, the recent encouraging signs of growth might not prove to be durable.
- Second, and more significantly, the economy has been operating far short of its potential, and the amount of slack is almost certainly large enough to mean that a sustained period of above-average growth is needed to remove it (Figure 1).

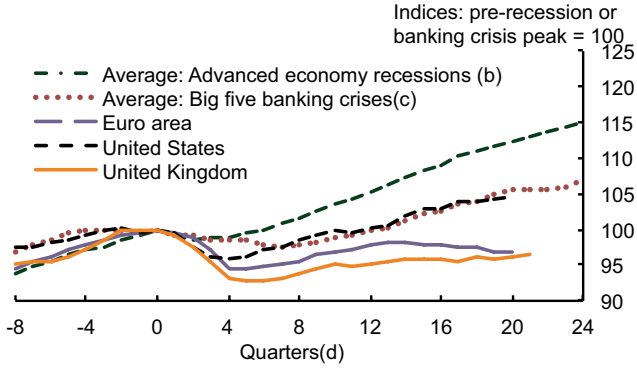
I believe that the main reason why it is now useful to offer guidance on the future stance of UK monetary policy is to reduce the risk of people believing that monetary policy would be quickly tightened once output began to rise at more normal rates. The nature of the guidance is simple. The message from the Monetary Policy Committee (MPC) is this:

- So long as inflation pressures don't start heading in the wrong direction, we will not tighten monetary policy until a recovery is strong enough, and sustained enough that it has made a meaningful dent in unemployment, so that it at least falls to 7%.

A key point here is that focusing just on the rate of growth of output is not a good guide to whether economic activity is running at a pace consistent with the control of inflation. Growth has to be seen in the context of the *level* of activity from which that growth comes. If that level of activity is significantly below a rate, consistent with controlled inflation – as I believe is the case in the UK today – then it does not make sense to quickly return monetary policy to a more normal setting once growth moves to more normal rates. One indication that the level of activity is well below what can be sustainable, and consistent with inflation at the target, is that unemployment is far higher than during the long period before the financial train wreck, and when inflation stayed close to target. Wage settlements have also been unusually low, running beneath the actual (and expected) rates of consumer price inflation for some years. That suggests two things:

- Slack in the economy is significant.
- Linking the horizon over which an exceptionally expansionary monetary policy continues to support demand to the rate of unemployment has merit.

Figure 1 Evolution of GDP around recessions and banking crises[(a)]



Sources: OECD, Reinhart and Rogoff (2008), Thomson Reuters Datastream and Bank calculations.
Notes: (a) Recessions are defined as at least two consecutive quarters of falling output. (b) Covers the G20 advanced economies over the period from 1960 to 2006. For some countries, data are not available back to 1960; for those countries, the sample starts at the earliest available date. (c) Big five banking crises are Spain (1977), Norway (1987) Finland (1991), Sweden (1991) and Japan (1992), as defined in Reinhart and Rogoff (2008). (d) Zero denotes the pre-recession peak in GDP, or the peak in GDP during the year of the banking crisis, as defined in footnote (c). For the UK quarter zero is 2008 Q1; the final quarter for the UK is 2013 Q2.

Now I will talk about forward guidance and what I see as its uses. But I want to talk at greater length about the sustainability of a period of more rapid growth and what it might mean for inflation pressures and optimal monetary policy. In doing that, I will offer some thoughts on economic modelling, and what I see as a deficiency in some of the most commonly used models of the whole economy.

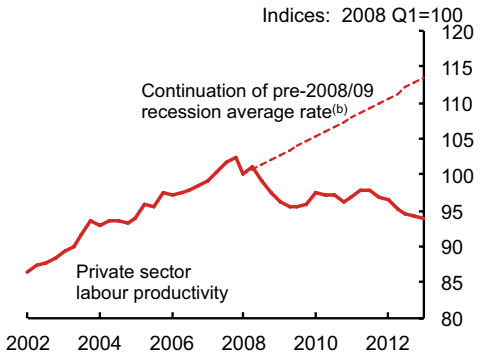
Forward guidance

Let me start with some observations about the guidance the MPC has recently given. As you will know, the essence of it is this: so long as inflation pressures remain consistent with inflation, moving back to the target monetary policy will not be tightened until a recovery has been sustained long enough to take the economy much closer to its potential level of production, such that unemployment is significantly lower (Bank of England, 2013). To my mind, the single most useful thing about giving this guidance is that it makes it clear that so long as inflation pressures remain controlled, a return to a more normal monetary policy is conditional on a *sustained* recovery in demand that brings down the rate of unemployment. Growth at average rates, or slightly above

them, for a couple of quarters is most unlikely to bring slack in the economy or the level of unemployment down significantly. So the guidance implies that a (very welcome) couple of quarters of normal – or a bit above normal – growth should not mean that policy is about to be tightened. The reason I think guidance is helpful now is that it reduces the risk that a recovery that is still somewhat embryonic is smothered by the anticipation that a tightening in monetary policy is imminent.

Since guidance was announced, market interest rates in the UK have moved up – both at the short end of the yield curve and at longer maturities. I suspect this is largely because the weight of money is behind a view that the significant positive news on the economic outlook means that the 7% unemployment level might be reached within around 18 months. This is rather sooner than I think is likely. It is plausible that the level of productivity – which has fallen enormously relative to the trend we have been on – will bounce back once growth becomes more sustained (see Figure 2). If that is so, unemployment is likely to fall rather more slowly than would be usual. None of this is certain; we shall see how things play out. Maybe the market moves will prove transient, maybe not. I should certainly be pleased if we saw unemployment fall fast *and* productivity move sharply back towards its trend path, because that would mean growth was very strong while inflation pressures might be contained since unit labour costs would be held down by rising output per hour worked.

Figure 2 Private sector labour productivity[(a)]

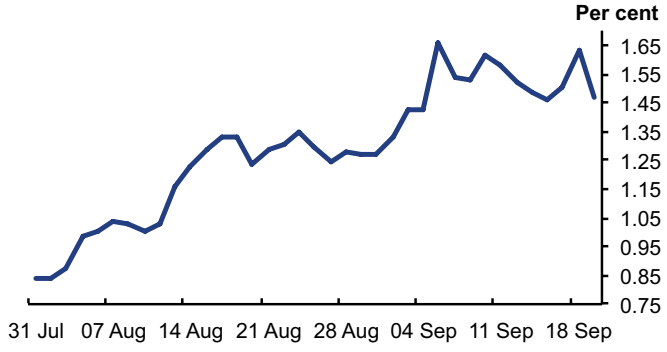


Notes: (a) Market sector output per hour. (b) The continuation of the pre-2008/09 recession average rate is calculated by projecting forward labour productivity from 2008 Q2 using the average quarterly growth rate between 1999 Q3 and 2008 Q1.

Whatever their reason, the financial market movements in the month or so since guidance was given at the start of August – a period during which the news on economic activity and demand in the UK has been consistently positive – have been quite significant. The 1-year Overnight Index swap (OIS) rate two years forward is up by around 60 basis points (Figure 3); the sterling effective exchange rate is up by around 4.5% (Figure 4); 2-3 year swap rates (on which most fixed-rate mortgages are priced) are up by between 16bp and 33bp (Figure 5).

These movements may not persist, but that is far from clear. Either way, I find it hard to see them as a sign that forward guidance has somehow failed at the outset. Yet, some have suggested that forward guidance has backfired because the economy has picked up. This means that the slow process of normalisation of monetary policy might have to begin before the middle of 2016, the date at which the MPC thought it was likely[2] that unemployment might have fallen to 7%.

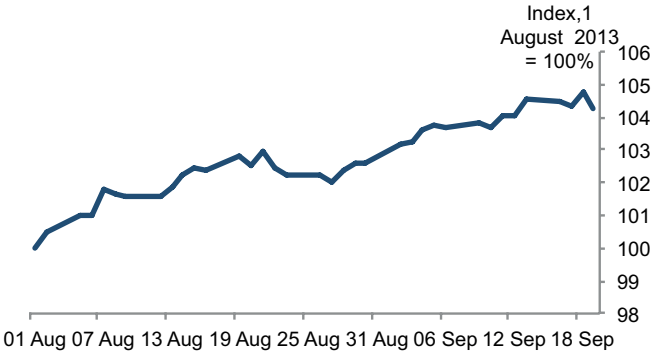
Figure 3 UK 1-year OIS rate, two years forward



Source: Bloomberg
Note: Last observation: 19 September 2013.

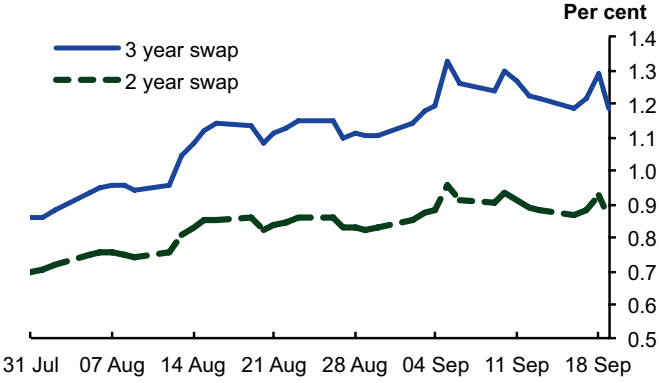
2 This is speaking rather loosely. To be exact, the MPC judged at the time of its August Inflation report that the unemployment rate is as likely to reach the 7% threshold before the forecast horizon in mid-2016 as after it. In other words, mid-2016 was the median estimate of the date at which the unemployment threshold would be reached.

Figure 4 Sterling ERI



Note: Last observation: 19 September 2013.

Figure 5 Daily swap rates

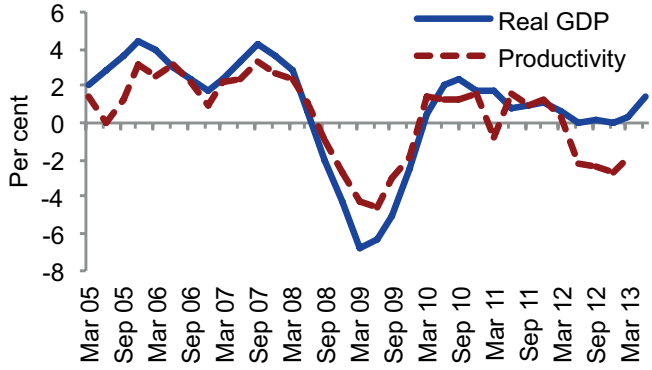


Source: Bloomberg
Note: Last observation: 19 September 2013.

I think there is a rather Alice in Wonderland, upside down logic to this. It implies that somehow the MPC finds signs of a recovery in the economy unwelcome. I can assure you that we do not! I would be pleased if growth turned out to be strong, productivity improved and inflation moved back towards the target level over the next 18 months. And if all that happened, so that unemployment came down steadily and significantly, then I should also be pleased to start the process of normalising monetary policy. No one should want the Bank Rate to be virtually zero for any longer than is needed, but it is quite possible to have average growth in the economy for six or eight quarters – and maybe above average growth – and yet not much reduction in unemployment

because productivity growth is rapid. Not only is this possible, I think it is plausible. Figure 6 shows just how strongly correlated growth in GDP and productivity are. It is natural for productivity – a highly cyclical variable – to grow fast once demand picks up after a period of very anaemic growth. If this happened in a way that meant unemployment only fell very modestly, it would also suggest that spare capacity might remain substantial, and that a very expansionary monetary policy remained appropriate.

Figure 6 Growth rates of real GDP and productivity



Sources: ONS, Bank calculations.
Notes: Quarterly data. Annual growth rates on quarter a year ago. Productivity is measured as output per hour.

I don't want to put much emphasis on some of the more bizarre interpretations as to what counts as success or failure of guidance. I think most businesses and households get the basic message: that so long as inflation pressures appear relatively well contained and consistent with a return to target, then it is only when there has been a sustained recovery that has eaten significantly into slack that policy will be tightened. And in fact although I think the (relatively modest) tightening in effective monetary conditions since early August – the rise in bond yields, the appreciation of sterling, the increase in money market rates – is not in itself helpful, it is what I would call a benign tightening. By a benign tightening, I mean that it is a response to stronger news on economic activity and confidence and not a malign tightening, when a rise in money market interest rates and in bond yields comes as people expect higher inflation down the road.

So while the tightening in monetary conditions is not a very helpful consequence of the news we have had over the past couple of months, the fact is that that economic news has been good. The surveys and the data on activity have been rather stronger than we might have expected at our August meeting (when we had already factored in some fairly favourable data relative to July). I would guess that right now, we might have a rate of growth in the economy of between 2.5 and 3.5%. I think that is unambiguously good. The key questions are whether it can carry on and if it does, what does it mean for the trajectory of inflation and the appropriate monetary policy.

The sustainability of a recovery and monetary policy

I think there are good reasons to believe that for an economy that has been in a deep recession, there can be multiple equilibrium paths forward. By which I mean that for a given stance of policy there can be different paths for output. On some of them, people are more optimistic in a way that is self-confirming. On others, low confidence about activity also becomes self-confirming. I think it is pretty clear that the higher-growth, more optimistic path is better, and indeed much of the academic literature on multiple equilibria in the aggregate economy shows that some paths are unambiguously better than others (they are Pareto superior).

The idea that there are multiple paths for the aggregate economy, each of which could be an equilibrium, has a long tradition in economics.[3] It is probably the central message of Keynesian economics. Keynes argued that expectations over future returns are volatile and crucial in shaping investment and consumption plans.[4] Swings in households' and firms' expectations can move the economy from a good to a bad equilibrium, and vice versa.

But Keynes' central message – that there can be multiple equilibria – has been lost in the standard models most economists have used over the past 10 to 15 years.

3 Azarides (2008) provides a concise overview.. For a discussion from a game-theoretic angle, see Cooper (1999).
4 Much of this literature formalises ideas that are in Chapters 5 and 12 of Keynes (1936).

These are models that get labelled New Keynesian, but in which assumptions are usually made to ensure that the model has a unique equilibrium for output and employment. Such models also have the property that the real economy tends to be self-correcting – shocks will take the level of output, investment and employment away from its steady path for a while, but there are strong forces which attract them back towards the path they were on in the absence of shocks.

I have much sympathy with the idea that the central message from Keynes has been lost in the standard models most economists, and central banks, have used in recent years. Roger Farmer (2013) and Lawrence Summers – amongst others – have made this point and some of the ideas in Robert Hall's recent Jackson Hole paper chime with it (2013).

For much of the time, a view of the world that sees it as having strong self-correcting characteristics that generate a path for output which fluctuates around a fairly smooth expansion path may be a reasonable approximation. But when shocks are really big, the forces drawing real output and employment back towards the path they had been on – a path that, in some sense remains, a feasible one despite the shock – can be very weak. So weak in fact that the economy may get stuck on a different trajectory for activity for so long that for practical purposes it might as well be considered as a new equilibrium path that does not converge back to the old one. One might – somewhat loosely – think of this view of the world as one with multiple equilibria.

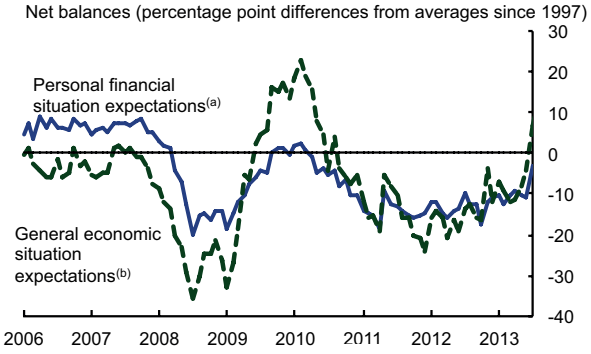
Let me sketch[5] one version of the multiple equilibria story, which seems relevant to the UK economy and to the sustainability of a path forwards from here along which there is much higher growth. It seems sensible to start by considering where we start from.

The financial crisis hit the UK economy hard. In 2008 and 2009, a dramatic rise in uncertainty and a rational fear that future incomes might be much lower sharply reduced the value of assets. That reinforced the pessimistic assessment of people's own

5 This is very much a sketch, and is not a formal model. But there are formal models consistent with this sketch. For formal models of the link between multiple equilbria and policy, see, eg, Cooper (2002) and Morris and Shin (2000). See also King and Wolman (2004).

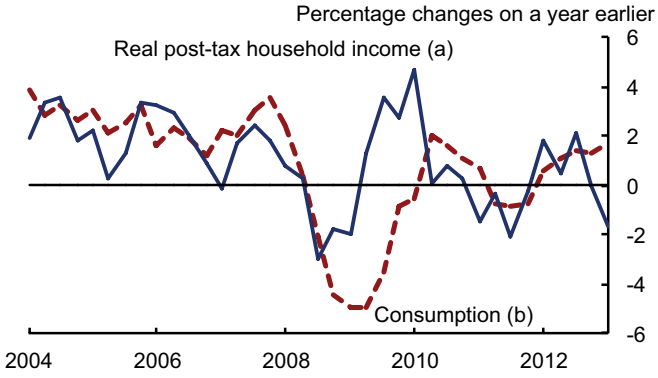
finances, and of the general economic situation taking their expectations to new lows (Figure 7). Unsurprisingly, consumption spending declined sharply (Figure 8).

Figure 7 Households' personal financial and general economic situation expectations



Source: Research carried out by GfK NOP on behalf of the European Commission.
Notes: (a) The question asks how households expect their personal financial situation to change over the next twelve months. (b) The question asks how households expect the general economic situation to change over the next twelve months.

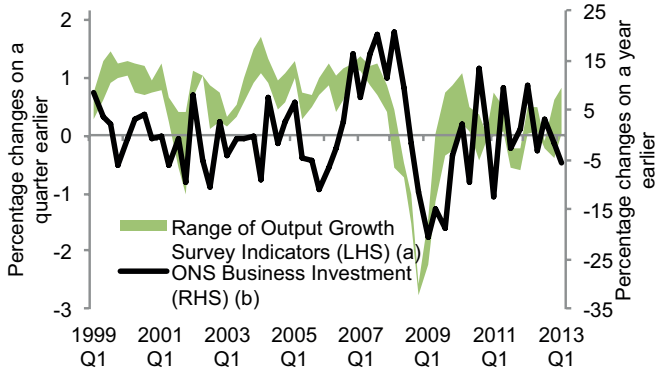
Figure 8 Household consumption and real income



Notes: (a) Total available household resources, deflated by the consumer expenditure deflator. Includes non-profit institutions serving households. (b) Chained-volume measure. Includes non-profit institutions serving households.

Investment fell even more sharply than consumption. The decline in real interest rates on safe assets was not reflected in a fall in the cost of finance to companies, so there was no offset to the joint effects of lower demand and falling confidence (Figure 9).

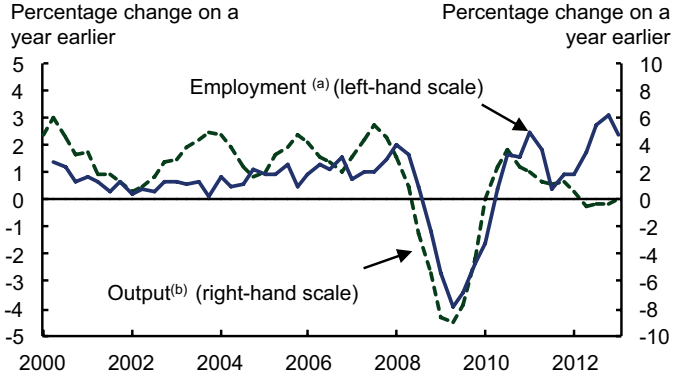
Figure 9 Business confidence and investment



Sources: Bank of England, BCC, CBI, CBI/PwC, Markit Economics, ONS and Bank calculations.
Notes: (a) Aggregate measures of business expectations from the BCC, CBI and Markit/CIPS surveys have been produced by weighting together sectoral surveys using nominal shares in value added. The surveys used are: BCC turnover confidence (non-services and services), CBI business optimism (manufacturing, financial services, business/consumer services and distributive trades) and Markit/CIPS orders (manufacturing) and business expectations (services). The BCC data are non-seasonally adjusted. The aggregate measures have been adjusted to have the same mean and variance as quarterly GDP growth over the period 1999–2013 Q2. Survey indicators have been moved forward one quarter. (b) Chained-volume measure. Business investment data have been adjusted by Bank staff to take account of the transfer of nuclear reactors from the public corporation sector to central government in 2005 Q2. Data are to 2013 Q1.

Employment declined, but by less than anticipated, in part because employers were mindful of the costs of rebuilding a workforce later, and workers accepted pay freezes to preserve their jobs (Figure 10).

Figure 10 Private sector output and employment



Sources: ONS (including the Labour Force Survey) and Bank calculations.
Notes: (a) LFS private sector employment. Calculated as the difference between LFS whole-economy employment and total public sector employment excluding publicly owned English further education corporations and sixth-form college corporations from the ONS's public sector employment release, adjusted to be on a calendar-quarter basis. Data start in 2000 Q2. (b) Market sector gross value added. Chained-volume measure at market prices.

With activity falling faster than employment, labour productivity declined. Real wages fell, in line with weak productivity (Figure 11). But unit labour costs rose, pushing up inflation (Figure 12).

Starting from such a situation, and after a series of such large negative shocks, one can envisage how an economy might evolve along two very different paths.

- One is a 'low confidence, weak growth' path.

Investment would remain weak, labour productivity would not pick up, and real wages would stagnate to match poor productivity. Because of weak productivity, unit labour cost growth might continue to be positive, so cost and inflation pressures would not look unusually weak, even though the economy is in a deep recession. Falling real wages would not bring forth a return to full employment because demand for labour would not rise enough in an environment where firms expect demand for their goods to continue to be weak. I think this is roughly the path the UK has been on for much of the period since the financial train wreck.

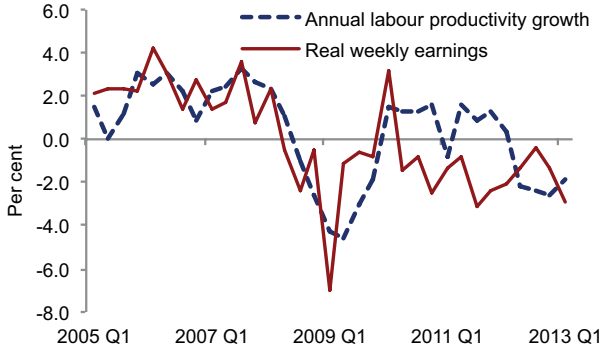
But an alternative, self-fulfilling upswing may also be possible.

- On this path productivity growth is faster, real wages can rise and rising real incomes can justify greater spending.

In this case greater optimism is self-confirming, and greater activity generates a sustainable upswing, during which productivity is stronger and higher incomes make the expectation of higher demand consistent with household plans.

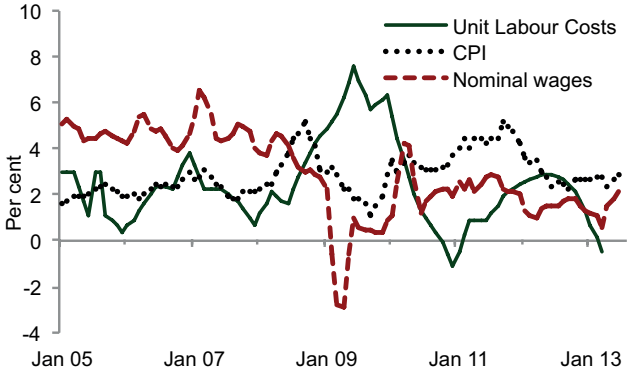
Inflation pressures generated within the economy may be quite similar along both paths, but for different reasons. In the first, inflation pressures do not fall much because unit labour cost growth is not unusually low; in the second, inflation pressures do not rise since stronger growth itself helps hold down unit costs of production because endogenous productivity growth creates flat costs of production.

Figure 11 Annual labour productivity growth and real wage growth



Sources: ONS, Bank calculations.
Notes: Quarterly data. Annual labour productivity growth is real GDP per hour. Real weekly earnings are calculated from ONS's average weekly earnings (AWE) figures, using the total earnings series deflated by CPI to 2005 prices.

Figure 12 Annual growth in nominal wages, unit labour costs and CPI



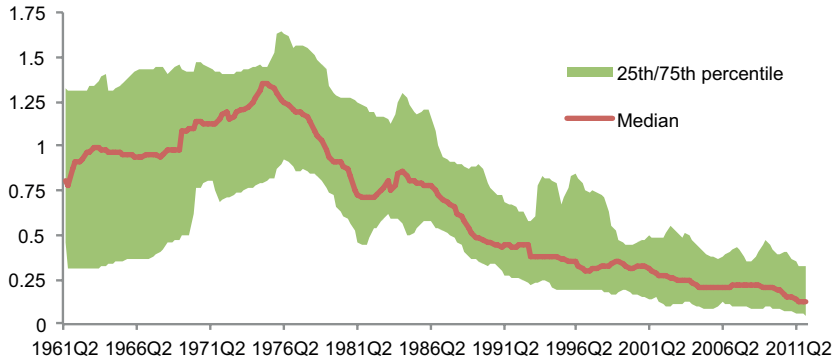
Source: ONS.

The growth rate of unit labour costs are quarterly data, CPI is monthly. Nominal wage growth figures are monthly 3-month averages and they are based on seasonally adjusted total nominal average weekly earnings.

This story – where different paths of output and slack generate rather similar paths for costs and inflation – would mean that the link between spare capacity and inflation would be quite weak. In other words, the Phillips curve would be quite flat. The evidence from a range of countries in recent years is consistent with this. A recent IMF study found that inflation increases almost one-for-one with longer-term inflation

expectations, but that a 1pp increase in cyclical unemployment would only lead to a 0.1pp reduction in contemporaneous inflation. Figure 13 shows the distribution of their time-varying estimates of the slope of the Phillips curve for 21 advanced economies. The slopes seem to have fallen to exceptionally low levels.

Figure 13 Range of estimates of the slope of the Phillips curve for 21 advanced economies



Source: IMF World Economic Outlook, April 2013
Notes: Country sample includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

But there is considerable uncertainty around the slope of the Phillips curve. Empirical estimates appear to depend on the precise specification of the equation, the estimation procedure, and the sample period (Mavroeidis 2013). Multiplicity of equilibria may be one reason behind these difficulties in pinning down the form of the Phillips curve.

In theory, there is a very big difference between being in a world in which there are multiple equilibria, or in one where the pull back towards a unique equilibrium level of real activity is very weak. But the practical difference may actually be rather small over a horizon of several years rather than several decades. That is important because the relevant horizon for monetary policy decisions is more likely to be several years than several decades.

Policy implications

What implications does the possibility of multiple equilibria have for monetary policy in the UK? Initially, the main distinction between the paths that I sketched above appears to be one of confidence: in the first, households and firms are pessimistic about their future earnings, whereas they are optimistic in the second. In both cases, beliefs are self-confirming.

I believe that monetary policy can help to kick the economy onto the better output path.

- In part this could be done by changing people's expectations about the future.
- Another possibility is to improve the fundamental conditions under which the economy operates.

Lowering interest rates would encourage consumption and investment spending to be brought forward. Those effects can work even if the economy has a unique long-run equilibrium because it can accelerate the transition back to it. Whether or not there are multiple equilibria, expectations and confidence can become more positive with a more expansionary monetary policy.

The recent rise in activity and confidence in the UK could be – I believe – sustainable and self-confirming. Until quite recently, it seemed to me that we remained on a path much more likely to be a low confidence, weak activity equilibrium. I favoured a more expansionary monetary policy to help shift the economy onto a better trajectory. There are some signs that we may now be on such a trajectory, and that is the reason I think keeping the Bank Rate and the stock of asset purchases at their current levels is the right policy for now.

I expect stronger growth to be consistent with inflation getting back to target through the course of next year, because any impact faster growth might have on some input costs to firms will be offset by stronger – and cost-reducing – growth in productivity. What the self-confirming and stronger path for output and confidence does *not* need

right now is tighter monetary policy. That is why I think the guidance that has been given on monetary policy is helpful. It says that we will not raise interest rates until unemployment falls to 7%, provided inflation is under control and there are no risks to financial stability.

Current policy

Let me come back to the current position in the UK and the policy issues. I would like to make four simple (indeed, obvious) points:

- Signs of stronger activity and confidence are very welcome – there is absolutely no double edge aspect to this that somehow comes from a tension with our forward guidance.
- Whether stronger activity means we get to a 7% unemployment rate much faster depends on the evolution of labour supply, and on how productivity responds to stronger demand. For any given path of output, the change in unemployment is very sensitive to any change in productivity. If productivity responds positively, there may be only a shallow fall in unemployment, despite stronger output growth. The table below illustrates this sensitivity.
- The 7% unemployment figure should be seen as a signpost, and not a preferred measure of slack. It is not a level of unemployment, such that once you move below it, slack is gone. One very powerful reason for stressing this is that the unemployment numbers mean something rather different to what has been typical in recent decades. This is because so many people are now in part-time work, and an unusually high proportion of them want to work more. David Bell and David Blanchflower investigated the implications in a recent paper (2013). They define underemployment as a situation in which someone is either unemployed, or is employed but would like to increase hours worked at the going wage rate. (They subtract the hours those in employment would like to work less

from their underemployment measure.) Bell and Blanchflower note that unlike unemployment, their measure of underemployment has continued to rise during most of the recession. Figure 14 illustrates this. Before the recession, those wishing to reduce their hours were balanced by those wishing to increase their hours, so the underemployment rate tracked the unemployment rate closely. But since the financial crisis, on a net basis, those working would have liked to work more hours. So, the underemployment rate exceeded the unemployment rate. This means that there is likely to be more slack in the labour market than the unemployment rate suggests.

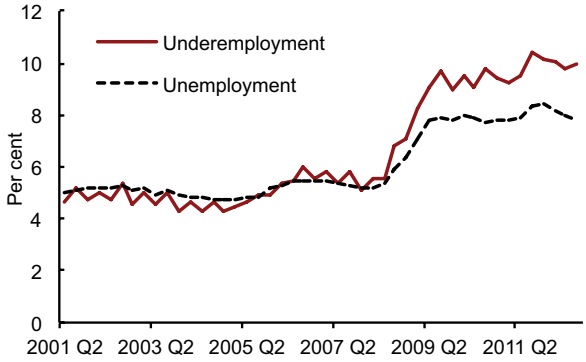
Table 1 Sensitivity of the unemployment rate to changes in output and productivity(a)

Unemployment rate at the three-year horizon (per cent)		Average four-quarter GDP growth over the forecast period (per cent)				
		2.25	2.5	2.75	3	3.25
Average four-quarter growth in productivity per hour over the forecast period (per cent)	2.25	9.6	8.9	8.2	7.5	6.8
	2	8.9	8.2	7.5	6.8	6.1
	1.75	8.2	7.5	6.9	6.2	5.5
	1.5	7.6	6.9	6.2	5.5	4.8

Sources: ONS (including the Labour Force Survey) and Bank calculations.
Notes: (a) Unemployment rate is a percentage of the economically active 16+ population. GDP is chained-volume measure at market prices. Productivity is whole economy output per hour. This highly stylised table gives a mapping between changes in output and changes in the unemployment rate, highlighting the sensitivity of that mapping to the response of productivity per hour. These numbers are only illustrative and are based on a number of simplifying assumptions about the elasticity of labour demand with respect to output, the extent to which increases in labour demand are met by increases in average hours worked rather than in the number of employees, and the participation rate.

The absence of rising inflation pressures alongside the better news on activity gives a compelling case for not normalising policy until recovery has been sustained and a meaningful reduction in unemployment has been achieved.

Figure 14 UK unemployment and underemployment index, 2001-12



Source: Bell and Blanchflower (2013).

Conclusion

I think there are good reasons to believe that for an economy that has been in a deep recession, there are likely to be multiple equilibrium paths forward. On some of them people are more optimistic in a way that is self-confirming. On others, low confidence about activity also becomes self-confirming. It seems plausible that you can have quite different paths for activity with very similar paths for inflation – on the low activity paths, unit labour costs may be very similar to the high activity paths. Low growth in nominal wages can be offset by low growth in productivity on the low growth path, while higher wages are offset by higher productivity growth on the high growth path. This is a powerful reason why an inflation targeting central bank should do all it can to get the economy onto the higher growth path.

I view the main way in which forward guidance can help in the UK now is to raise the chances of staying on that more favourable path. I believe we may be able to achieve that with the current setting for policy. That is a more optimistic position than I took a few months ago, when I believed that resuming asset purchases was warranted. The recent rise in activity and confidence has the potential – I believe – to be sustainable and self-confirming. This is not guaranteed. But I am now more confident that we are on path to recovery than at any time since I joined the MPC in the first part of 2009. What

a *potentially* self-confirming and stronger path for output and confidence does *not* need right now is tighter monetary policy. That is what the guidance that has been given by the MPC is designed to avoid.

Of course, we could well have a slide in activity and in confidence for other reasons – there is no shortage of things that could make that happen. But if that is how things play out, we can and should do something about it.

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About the author

David Miles joined the Monetary Policy Committee at the Bank of England in June 2009. He is also a Visiting Professor at Imperial College. Miles was formerly a professor of financial economics and head of the Finance Department at Imperial. As an economist he has focused on the interaction between financial markets and the wider economy. He was Chief UK Economist at Morgan Stanley from October 2004 to May 2009.

He has been a specialist economic advisor to the Treasury Select Committee. In Budget 2003, the Chancellor commissioned Professor Miles to lead a review of the UK mortgage market. The result, published at Budget 2004, was the report: "The UK mortgage market: taking a longer-term view". He is a council member of the Royal Economic Society, a research fellow of CEPR and at the CESIFO research institute in Munich. He is a former editor of *Fiscal Studies*.

Part II

Empirics and Economic Theory on Forward Guidance

Low for How Long? Estimating the ECB's "Extended Period of Time"

Tilman Bletzinger and **Volker Wieland**
Goethe University Frankfurt

The ECB has promised to keep interest rates low for an "extended period of time". In a broad hint to the profession, President Draghi stressed a reasonable forecast of this period could be extracted from a monetary policy reaction function. This chapter presents one such forecast based on published macro forecasts and a reaction function that fits the ECB's past behaviour. The result is that ECB interest rates will rise by May 2014 at the latest.

The ECB Governing Council has given hints that it will keep rates low for long (see its May and June statements). On 4 July 2013, the Council went further embracing 'forward guidance' (Praet 2013, Woodford 2013).[1]

> "The Governing Council expects the ECB interest rates to remain at present or lower levels for an extended period of time."

By providing information on expected future policy decisions, policymakers remove uncertainty about the policymakers' own expectations. This type of forward guidance of market expectations is used more and more widely among central banks.

- The central banks of Norway and Sweden belong to those that have moved furthest in this direction by regularly publishing their forecasts of policy rates together with their forecasts of inflation and economic activity (see Norges Bank 2013 and Sveriges Riksbank 2013 for descriptions of their practices).

1 The full quote is: "Looking ahead, our monetary policy stance will remain accommodative as long as necessary. The Governing Council expects the ECB interest rates to remain at present or lower levels for an extended period of time. This expectation is based on the overall subdued outlook for inflation extending into the medium term, given the broad-based weakness in the real economy and subdued monetary dynamics."

They even add measures that reflect the likelihood of different policy paths depending on the uncertainty around the economic outlook.

Forward guidance and the ECB's aim

More information on the ECB's forward guidance was given by Draghi at press conferences held on 4 July and 1 August 2013.[2] On August 1, for example, he stated that future policy rates are being conditioned on the ECB's macroeconomic outlook.[3]

The exact numerical expectation of the policy path and the length of time, for which the Governing Council anticipates policy rates to stay at current or lower levels, remain uncertain to market participants. Draghi stressed that there was no precise deadline to this "extended period of time". But then he gave an important hint. He said:

"As a matter of fact, you can … extract a reaction function and, from there, estimate what would be a reasonable extended period of time".

This is precisely the purpose of this column. (See Bletzinger and Wieland (2013) for detailed calculations etc.)

Estimating how long rates will stay low

We use a reaction function from the literature to project the interest rate path that is consistent with the macroeconomic outlook. Specifically, we use the interest rate rule from Orphanides and Wieland (2013), which matches past ECB interest rate decisions quite well.

2 Further information on the implementation of the ECB's forward guidance and its motivation has been provided in a paper by Peter Praet (2013), the Member of the Executive Board in charge of the Directorate General Economics.

3 Specifically, Draghi said: "our formulation of forward guidance is in line with our strategic framework, which is anchored in our assessment of the medium-term outlook for inflation, or price stability. And this outlook depends on economic activity and on money and credit developments. So this is our strategic framework, within which we can say that medium-term inflationary expectations remain firmly anchored."

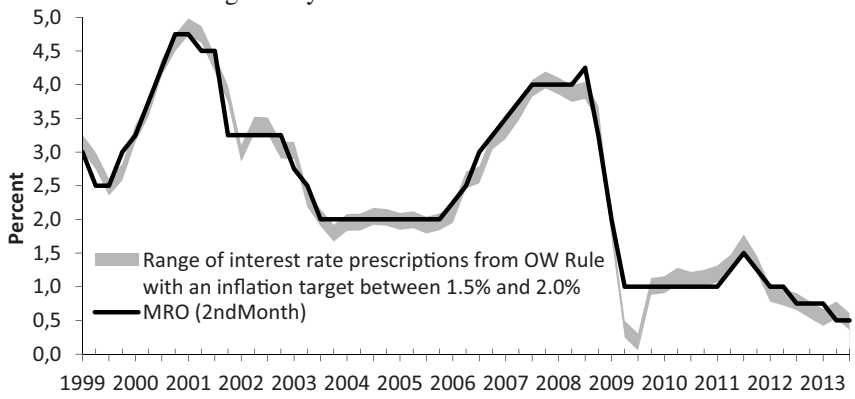
This interest rate rule, i.e. reaction function, assumes that the ECB changes the interest rate in response to two deviations:

- Deviations between forecast inflation and the ECB's target; and
- Deviations between forecast GDP growth and estimated GDP growth potential.

The two deviations are given equal weights. A one-percentage-point deviation of the inflation forecast from target would result in a 50-basis-point adjustment of the policy rate. A one-percentage-point deviation in growth would have the same impact on interest rates.

Despite its simplicity, this rule already incorporates two of the concerns mentioned by the ECB statement directly, i.e. the inflation and growth outlooks. It could be extended to include monetary dynamics, but it already matches past ECB decisions very well in its current form. See Figure 1, which compares the historical interest rate prescriptions from the Orphanides-Wieland rule to the ECB policy rate on its main refinancing operations (MRO Rate). The range of prescriptions spanned by the 1.5% and 2% assumptions on the inflation objective matches the ECB's interest rate decisions very well.

Figure 1 Main refinancing operations rate versus Orphanides and Wieland (2013) Rule using Survey of Professional Forecasters Forecasts



Notes: The black line shows the ECB's interest rate on its main refinancing operations in the second month of each quarter from 1999:Q1 to 2013:Q3. The grey shaded area is constructed with the OW Rule: MRO rate = (previous MRO rate) + 0.5(3-quarter ahead forecasted inflation deviation from target) + 0.5(2-quarter ahead forecasted GDP growth rate gap from potential). The lower line of the shaded area has an inflation target of 2% and the upper line a target of 1.5%. The forecast data is from the ECB Survey of Professional Forecasters (SPF).

Projecting ECB interest rates forward

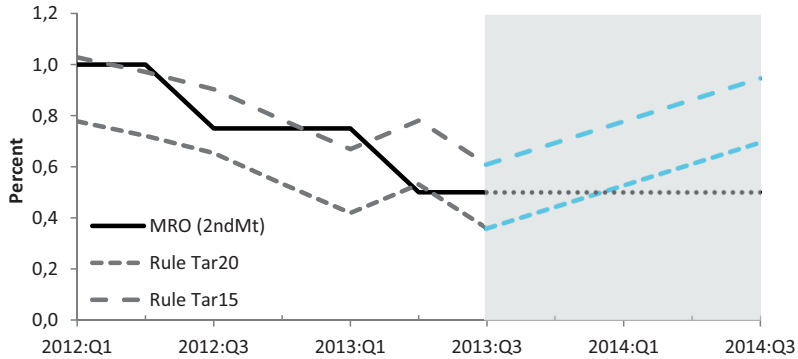
The reaction function requires forecasts. Ideally, one would want to feed in ECB Governing Council members' forecasts of inflation and output growth, but those are not publicly available. Instead we use those of the Survey of Professional Forecasters published by the ECB most recently on 9 August 2013.

Figure 2 displays the resulting projection of the interest rate path. Since the ECB inflation target is not explicit, we do the projection with that inflation target at 1.5% (long dashes) and 2% inflation target (short dashes).

- The lower projection (based on the 2% target) breaches the current interest rate setting in the first quarter of 2014.
- By the second quarter of 2014, both projections are above the current interest rate (MRO rate), which is now at 50 basis points.

As the relevant timing of the interest rate is the second month of the quarter, this projection implies that the ECB should anticipate raising its key interest rates at the latest by May 2014.

Figure 2. Projected rate path using the Orphanides and Wieland Rule with Survey of Professional Forecasters forecasts until 2014:Q3



Notes: The black line shows the ECB's interest rate on its main refinancing operations in the second month of each quarter from 2012:Q1 to 2013:Q3. The gray dashed lines show the OW Rule: MRO rate = (previous MRO rate) + 0.5(3-quarter ahead forecasted inflation deviation from target) + 0.5(2-quarter ahead forecasted GDP growth rate gap from potential). The lower gray line has an inflation target of 2.0% and the upper line a target of 1.5%. The blue lines show the projected rate path implied by available inflation and output growth forecasts. The forecast data is from the ECB Survey of Professional Forecasters (SPF).

Projections with the macro forecasts of ECB staff

Figure 2 uses macro projection from the ECB's Survey of Professional Forecasters. If instead we use Eurosystem staff projections, the resulting estimates of the ECB's "extended period of time" moves even further into the future. However, the rule with staff projections does not match past ECB decisions, including those in 2012 and the first half of 2013 as well as the rule with Survey of Professional Forecasters forecasts.

What about normative concerns?

Should other interest rate benchmarks be given weight in the policy decision? Of course, there are other well-known benchmarks that could be used. For example, the

well-known Taylor rule has provided a useful signal ahead of the financial crisis by indicating that policy rates in the US were too low for too long prior to 2007.

- Applied to the Eurozone at the current juncture the original Taylor rule would prescribe higher interest rates now and in the future.

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Odyssean Forward Guidance in Monetary Policy: A Primer[1]

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One of the recent policy tools used by the Federal Open Market Committee is forward guidance. This chapter builds a qualitative theory of forward guidance and discusses current monetary policy through the lens of the model. It shows that forward guidance can improve macroeconomic outcomes, though the question of how well the current forward guidance matches the theory is still unanswered.

Introduction and summary

The monetary policy statement of the Federal Open Market Committee (FOMC) from its September 2013 meeting reads in part:

> In particular, the Committee decided to keep the target range for the federal funds rate at 0 to ¼ percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6½ percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2% longer-run goal, and longer-term inflation expectations continue to be well anchored.[2]

This extended reference to the conditions determining the FOMC's future interest rate decisions is an example of *forward guidance*.

1 I am grateful to Marco Bassetto, Charlie Evans, Jonas Fisher, Alejandro Justiniano, and Spencer Krane for many stimulating discussions on forward guidance; and to Wouter den Haan, Alejandro Justiano, and Dick Porter for their helpful editorial feedback. The views expressed herein are those of the author and do not necessarily represent those of the Federal Reserve Bank of Chicago, the Federal Reserve System, or its Board of Governors. All errors herein are the author's responsibility. This chapter is being concurrently published in *Federal Reserve Bank of Chicago Economic Perspectives.*

2 The full press release from 18 September 2013, FOMC meeting is available at www.federalreserve.gov/newsevents/press/monetary/20130918a.htm.

Although participants in FOMC meetings have long used speeches and congressional testimony to discuss the Fed's possible responses to economic developments, the committee has only issued formal and regular forward guidance since February 2000 when it began to include in its statement a "balance of risks." This first one read as follows:

> Against the background of its long-run goals of price stability and sustainable economic growth and of the information currently available, the Committee believes the risks are weighted mainly toward conditions that may generate heightened inflation pressures in the foreseeable future.[3]

Less than two years later, the Committee's 21 August 2001 statement noted that "... the risks are weighted mainly toward conditions that may generate economic weakness in the foreseeable future".[4]

Between the FOMC's first statement of risks and the financial crisis that began in August 2007 and intensified in September 2008, the Fed experimented with making its internal decision-making process more transparent, and therefore more forecastable. In this, they followed several other central banks that had already adopted explicit inflation targets. (For a review of inflation targeting and its implementation outside of the US, see Bernanke and Woodford 2005.) The financial crisis dramatically accelerated the transition to greater openness, and the FOMC's forward guidance became more elaborate and detailed. After lowering the federal funds rate from 5.25% in early August 2007 to 0-25 basis points in mid-December 2008, the Committee's statement read: "In particular, the Committee anticipates that weak economic conditions are likely to warrant exceptionally low levels of the federal funds rate for some time."[5] "Extended period" replaced "some time" in March 2009, adding specificity. This phrase remained in the statement until the August 2011 meeting, when it was replaced with the even

3 See www.federalreserve.gov/boarddocs/press/general/2000/20000202/default.htm.
4 See www.federalreserve.gov/boarddocs/press/general/2001/20010821/default.htm.
5 See www.federalreserve.gov/newsevents/press/monetary/20081216b.htm.

more specific "at least through mid-2013." The January 2012 statement pushed this date back to "late 2014."

By this point, these statements had become known as *calendar-based* forward guidance. Campbell et al (2012) discuss the confusion this language had engendered among the public and market participants as of early 2012. Was "late 2014" a forecast that the economy would remain weak until then, or a reassurance that the committee would keep interest rates low through that date regardless of economic developments? The Committee's September 2012 statement somewhat clarified this by stating that "the Committee expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens."[6] Also in that statement, "late 2014" became "mid-2015." In its 12 December 2012 statement, the FOMC changed the nature of its forward guidance to reduce confusion by explicitly tying increases in the federal funds rate to unemployment and inflation outcomes using language nearly identical to that from its September 2013 meeting quoted previously.[7]

It might seem paradoxical that at a time when the FOMC has done so little with its policy interest rate, it has talked so much about its plans. Even in normal times, a policymaker promising particular future actions constrains her future behaviour and concomitantly loses flexibility. However, such forward guidance (sometimes called "open-mouth operations") can substantially improve *current* economic performance when households' and businesses current decisions depend on their expectations of *future* macroeconomic outcomes. If the FOMC's assurances that rates will remain low raise private individuals' expectations for future inflation and growth, then they will wish to consume more today; thereby lifting current aggregate demand and closing the output gap (the gap between actual and potential economic output). Although this benefit might indeed come at the cost of future flexibility, poor enough current macroeconomic performance might merit this sacrifice. When the zero lower bound (ZLB) on interest

6 See http://www.federalreserve.gov/newsevents/press/monetary/20120913a.htm.
7 See www.federalreserve.gov/newsevents/press/monetary/20121212a.htm.

rates makes further conventional accommodation unfeasible, the exchange of future flexibility for current macroeconomic performance becomes especially attractive.

Future policy intentions only have impact if credible

In general, statements of future policy intentions have no impact (benign or otherwise) when the public does not find them *credible*. This problem is particularly acute for a central bank, because a central bank seeking to improve households' current and future welfare will be tempted to renege on past interest rate promises. The interest rate that is currently optimal might not be consistent with promises that improved past economic performance, and breaking those promises now does nothing to the past and improves present and future outcomes. If the public anticipates that monetary policymakers will apply such logic in the future, then promises of low future interest rates will not be believed, and therefore will have no beneficial effect in the present. This conundrum is one example of the *time-consistency problem*, the discovery of which earned Kydland and Prescott (1977) the Nobel Prize in 2004. Since this kind of beneficial forward guidance requires the policymaker to keep past promises even when sorely tempted to do what seems best at the moment, Campbell et al (2012) label this *Odyssean forward guidance*. Like Odysseus bound to the mast of his ship, a monetary policymaker must foreswear the Siren call of the moment and stick to plans laid in the past. Odysseus achieved this with ropes for himself and earwax for his crew. Research into the analogous tools available to monetary policymakers is ongoing.

Of course, not every pronouncement by a monetary policymaker is a promise. Some statements merely forecast the evolution of the private economy. Campbell et al (2012) label such forecast-based statements *Delphic forward guidance*. Like the pronouncements from the oracle of Delphi, they forecast but do not promise. While Delphic pronouncements undoubtedly contribute positively to the execution of monetary policy, I ignore them in this chapter to develop instead a primer on the economic theory of Odyssean forward guidance.

This primer's basic framework is the minimal New Keynesian model, in which the central bank chooses the interest rate to achieve the best feasible trade-off between output and inflation. First, I discuss this model, develop key results, and present some simple calculations of optimal monetary policy paths that start with the economy at the ZLB. Although I review the model's two linear equations, one inequality, and quadratic social welfare function in the text, I present the main results in graphs for simplicity. I conclude with a brief discussion of current monetary policy examined through the lens of this theory.

Forward guidance in the New Keynesian model

Effective forward guidance requires the central bank to *communicate* its intentions and the public to believe that the bank is *committed* to their execution. The potential contribution of communication and commitment to improved monetary policy can be most easily appreciated in the canonical New Keynesian model that summarises the behaviour of producers, households, and a central bank with a Phillips curve, an intertemporal substitution (IS) curve, the ZLB on interest rates, and a central bank loss function.

$$\pi_t = \kappa \tilde{y}_t + \beta \pi_{t+1} + m_t \qquad (1)$$

$$\tilde{y}_t = -\frac{1}{\sigma}(i_t - \pi_{t+1} - r_t^n) + \tilde{y}_{t+1} \qquad (2)$$

$$i_t \geq 0 \qquad (3)$$

$$L = \sum_{t=0}^{\infty} \beta^t \frac{1}{2}(\pi_t^2 + \lambda \tilde{y}_t^2) \qquad (4)$$

More advanced versions of this model incorporate uncertainty about future macroeconomic outcomes. For the sake of simplicity, this primer abstracts from this complication and presumes that, conditional on the central bank's policy choices, future macroeconomic outcomes can be calculated with certainty.

In equation 1, π_t is the rate of price inflation in year t and $\tilde{y}_t$ is that year's *output gap*, defined to be the percentage deviation of actual output from its potential. (In

New Keynesian models, producers can only adjust their dollar-denominated prices infrequently. It is this sluggish price adjustment that drives output away from its potential.) The influence of future inflation on its current level reflects the forward-looking behaviour of producers choosing their prices. Woodford (2003) and Gali (2008) present deviations of equation 1 from the optimal pricing decisions of producers who can only adjust their nominal prices infrequently. In those derivations, the coefficient β is the discount factor producers apply to their future profits. The Philips curve's *slope*, κ, is an increasing function of the frequency of price adjustment. Perfectly flexible prices lead to a vertical Phillips curve, so that $\kappa = \infty$, while perfectly rigid prices set κ to zero. The output gap influences producers' prices because it reflects their current marginal costs of production. The *markup shock* finishes the right-hand side of equation 1. It evolves exogenously and embodies changes in producers' prices that are unrelated to changes in their marginal costs. For example, an exogenous decline in competitive price pressures due to leniency in antitrust enforcement or innovations in market segmentation can be manifest as a positive m_t. Because the Phillips curve reflects the decisions of the producers, it is often labeled the economy's "supply side".

Equation 2 reflects households' split of current income between saving and consumption. The model's households can invest in a one-year risk-free bond at the nominal interest rate i_t. This choice yields the inflation adjusted return $i_t - \pi_{t+1}$. Individual households can buy and sell this bond in unlimited amounts, but we keep the model simple by assuming that it is in zero aggregate supply. The economy has no capital or other means for real wealth accumulation, so total consumption must equal total income. Therefore the output gap $\tilde{y}_t$ also equals the percentage deviation of actual consumption expenditures from their potential. From this perspective, the IS curve relates the current consumption gap to the interest rate and the consumption gap in the next period. The parameter σ is called the *intertemporal elasticity of substitution*. It is typically positive, so that increases in the interest rate induce households to increase saving and delay consumption. On the other hand, high future consumption reduces the incentive to save, and increases current consumption. The final term requiring explanation in equation 2

is r_t^n, the *natural rate of interest*. This term is an exogenously evolving sequence that embodies changes in households' relative valuations of current and future consumption. If r_t^n drops but $i_t - \pi_{t+1}$ remains the same, then the household wishes to reduce current expenditures to save more now and, thereby, allow more consumption in the future. In this sense, a relatively low value of r_t^n indicates that the household is unusually patient. However, this household-based interpretation of r_t^n is probably at best a convenient fiction. In practice, many economists interpret low measured levels of r_t^n since the onset of the financial crisis as arising from the crisis itself, and the resulting desire of both households and financial firms to remove both debt and risk from their balance sheets.[8] The IS curve can be thought of as the economy's "demand side".

The ZLB in equation 3 seems natural to most people, because negative nominal interest rates are rarely, if ever, observed. It also has empirical appeal, because investors can move their portfolios into cash (which has a zero interest rate by construction) rather than holding bonds with negative rates.[9] In this article, I follow Eggertsson and Woodford (2003) and Christiano et al. (2011) and make the ZLB relevant with a large negative value of the natural rate of interest.

The central bank controls the nominal rate of interest, and its choices influence inflation and the output gap through the Phillips and IS curves. The Federal Reserve Act mandates that the FOMC use this influence:

> To promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.

The model's central bank fulfills such a mandate by choosing interest rates to minimise the loss function in equation 4. It penalises current and future deviations from zero

8 Since it corresponds to no specific market interest rate, r_t^n cannot be directly observed. However, it can be inferred from observations of actual interest rates and households' consumption and savings decisions. See Justiniano and Primiceri (2010) for a review of this procedure

9 One might object that the simple model economy at hand has no cash, only one-period bonds. Woodford (2003) asserts that adding cash to the model leaves its basic economics unchanged. This article uses the cashless version of the New Keynesian model to maintain simplicity.

inflation and of the output gap.[10] The coefficient λ gives the central bank the relative weight on its output stabilisation objective.[11] The central bank uses the firms' discount factor, β, to evaluate the trade-off between current and future losses. Woodford (2003) and Galí (2008) both give derivations of this loss function as quadratic approximations of households' welfare. Under this interpretation, both inflation and deflation distort the relative prices of goods; and positive and negative output gaps move households away from their desired allocation of time between labour and leisure.

The central bank's choice of i_t directly influences the current output gap through the IS curve and, thereby, indirectly influences inflation through the Phillips curve. However, this traditional static view of monetary policy is incomplete because producers and consumers base their decisions not merely on current policy but also on their expectations for future inflation and output. It is this channel that makes forward guidance potentially useful.

Discretionary monetary policy

One cannot appreciate the value of commitment without understanding outcomes in its absence, so I begin with a review of monetary policy under discretion. By *discretion*, I mean that the central bank can set the current interest rate but has no direct influence over future rates until the future itself arises. As discussed earlier, a discretionary central bank takes no account of how expectations of its current actions influenced past behaviour because those bygones are just that, bygones. There is little room for central bank communication to alter macroeconomic outcomes, because the only credible forward guidance simply describes what the central bank will find to be optimal when

10 Virtually by definition, bringing the output gap closer to zero improves social welfare. However, zero inflation is not necessarily the socially-optimal definition of "price stability". Reifschneider and Williams (2000) discuss this in more detail. For simplicity, this primer abstracts from this issue by defining "price stability" with a zero inflation rate.

11 One might object that the output gap appears in equation 4 rather than the analogously-defined employment gap. Since Okun's law connects these two gaps, the stabilisation of the output gap is indeed consistent with the Fed's dual mandate. See Evans (2011) for a discussion of this issue.

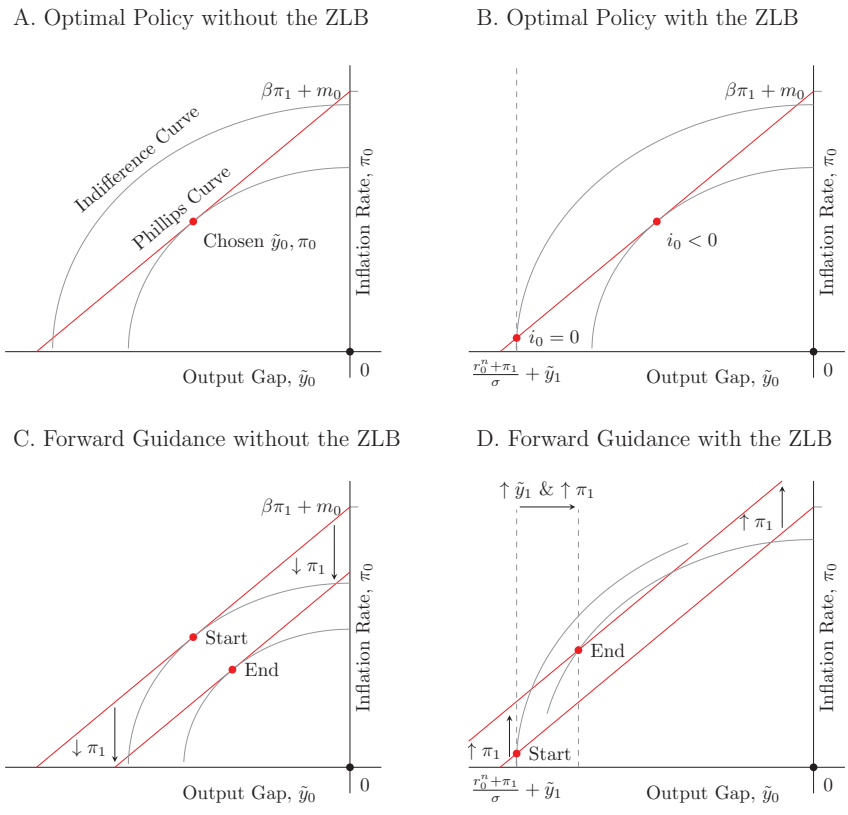
the time comes. Campbell et al. (2012) place such statements in the category of Delphic forward guidance.

Since future interest rates determine future inflation rates and output gaps, the only terms in the central bank's loss function under its current control give the *current loss,* $\frac{1}{2}(\pi_0^2 + \lambda\tilde{y}_0^2)$. The discretionary central bank's optimal interest rate minimises this current loss taking as given $\tilde{y}_1$, π_1, m_0 and r_0^n.

The divine coincidence

I begin consideration of this choice with the very special case in which $m_t = 0$ and $r_t^n \geq 0$ always. If fortuitously both $\tilde{y}_1$ and π_1 also equal zero, then the IS curve allows the central bank to achieve a zero output gap by simply setting i_t to r_t^n. Since $\beta\pi_1 + m_0 = 0$, the Phillips curve translates a zero output gap into zero current inflation. That is, if future inflation and the cost-push shock both equal zero, and the natural rate of interest is positive, then the central bank can achieve the minimum possible loss by completely stabilising both the output gap and inflation. Blanchard and Galí (2010) have referred to a similar result in a more complicated model as a "divine coincidence." The Phillips curve, which determines which inflation and output gap combinations are feasible, passes through the best possible such combination: no inflation and no output gap. One might object that this superior outcome merely reflects the good fortune of inheriting expectations of price and output stability, but the fact that the central bank wishes to achieve such stability gives one reason to believe that it will occur. Indeed, if both $\tilde{y}_2$ and π_2 equal zero, then the central bank can, and will, achieve complete macroeconomic stability in period 1. Continuing in this fashion yields the following result: if $m_t = 0$ always and r_t^n is never negative, then the interest rate rule $i_t = r_t^n$ is feasible and can achieve complete macroeconomic stabilisation. To prove the result to yourself, simply note that the sequences $\tilde{y}_t = 0$ and $\pi_t = 0$ satisfy both the Phillips and IS curves if $r_t^n = i_t$ always. Furthermore, this interest rate choice minimises the current loss, so households and businesses should expect the central bank to follow it.

Figure 1 The inflation-output trade-off



The output-inflation trade-off

When $\beta\pi_1 + m_0$ differs from zero, the central bank cannot achieve complete stabilisation because the Phillips curve no longer passes through the origin. In this case, the discretionary central bank faces a classic output-inflation trade-off. Panel A of Figure 1 illustrates this trade-off with a familiar indifference curve-budget set diagram. Here, the Phillips curve (in red) plays the role of the budget constraint. The central bank can choose any inflation-output gap combination on the curve. Its slope equals κ, and it crosses the vertical axis at $\beta\pi_1 + m_0$. The family of indifference curves comes from the central bank's loss function. Each one gives the inflation-output gap combinations that

yield a constant value for the *current* loss function. If λ equals one, each indifference curve is a circle. In general, the curves are ellipses, but I have drawn only their portions in the northwest quadrant. The points on an indifference curve that lie inside of another curve give a lower total loss. If the central bank were to choose an inflation-output gap combination with an indifference curve that *crosses* the Phillips curve, then it could achieve a lower loss by sliding away from the closest axis along the Phillips curve. Therefore, the Phillips curve must be *tangent* to the best possible point's associated indifference curve. This is marked in the figure with the red point labeled "Chosen $\tilde{y}_0$, π_0". The central bank tolerates both higher-than-desired inflation and lower-than-desired output as the best feasible outcome. The exact inflation and output gap chosen balances the loss from increasing inflation slightly with the loss from slightly deepening the recession.

The nominal interest rate is notable in this standard analysis of the output gap-inflation trade-off by its absence. The Phillips curve *alone* determines the output-inflation trade-off. So long as the desired output gap is not below what can be achieved by setting i_0 to zero, the IS curve merely determines the nominal interest rate that guides the private sector to the central bank's favoured outcome. The IS curve becomes more relevant to the problem when the ZLB on i_0 constrains the central bank. To see how, isolate i_0 on the left-hand side of equation 2, substitute the resulting right-hand side into the ZLB in equation 3, and arrange the result to put $\tilde{y}_0$ on the lower side of the inequality.

$$\tilde{y}_0 \leq \tilde{y}_1 + \frac{r_0^n + \pi_1}{\sigma}$$

That is, the ZLB and IS curve together put an *upper bound* on the output gap. When this upper bound is a negative number, it can be interpreted as a lower bound on the size of a recession. If this lower bound is high enough, then conventional interest rate policy cannot mitigate a recession. Panel B of Figure 1 depicts the central bank's choice in this case. The dashed vertical line indicates the location of the upper bound on $\tilde{y}_0$. Without the ZLB, optimal monetary policy would guide the economy to the tangent point marked "$i_0 < 0$." The ZLB moves the actual outcome southwest along the Phillips

curve to the point marked "$i_0 = 0$" where the Phillips curve intersects the vertical line. Since the central bank's indifference curve is steeper than the Phillips curve, it would like to reduce the current output gap at the expense of higher inflation. However, the ZLB prevents it from doing so. This illustrates how conventional monetary policy at the ZLB is "too tight."

Monetary policy with commitment and communication

Both the Phillips curve and IS curve are forward-looking, so each of them can serve as a channel for forward guidance to influence current macroeconomic outcomes. Panels C and D of Figure 1 illuminate these channels. Suppose that the central bank could credibly influence private expectations about inflation in year one. Lowering π_1 directly shifts the Phillips curve down and thereby expands the set of possible current output gap-inflation outcomes. Panel C illustrates this situation, in which the forward guidance moves inflation and the output gap toward their desired levels. Economically, a credible promise of future disinflation lowers producers' current desired prices and, thereby, allows the central bank to achieve a given level of current inflation with a smaller output gap. Of course, the promised deflation and its accompanying output gap also cost the central bank. The size of the cost depends on the initial values for π_1 and $\tilde{y}_1$. If a substantial deflationary recession was already anticipated, then fighting current inflation with forward guidance might be too costly. On the other hand, if both π_1 and $\tilde{y}_1$ begin at zero, then slight changes to them have very, very small costs.

Since the IS curve is irrelevant for discretionary monetary policy away from the ZLB, it should be no surprise that forward guidance works through the IS curve only when the ZLB constrains policy. Panel D of Figure 1 shows how forward guidance can influence outcomes in this case. The upper bound for $\tilde{y}_0$ derived from the IS curve and the ZLB constraint increases in both π_1 and $\tilde{y}_1$, so this lower bound shifts to the right if the central bank's promises of low future interest rates increase expectations of inflation, the output gap, or both in year one.

If this were the end of the story, the forward guidance would slide the inflation-output gap outcome along a fixed Phillips curve. However, the increase in promised inflation also shifts the Phillips curve up. As drawn, the cost of the additional current inflation is less than the benefit from the reduced output gap. (The indifference curve running through the point marked "End" is interior to the one passing through "Start".) Just as in the case displayed in Figure 1, whether this improvement in current outcomes is worth the required change in π_1 and $\tilde{y}_1$ will depend on their initial levels. If the central bank inherits expectations of future macroeconomic stability, then the cost of forward guidance is small.

Optimal monetary policy as a path

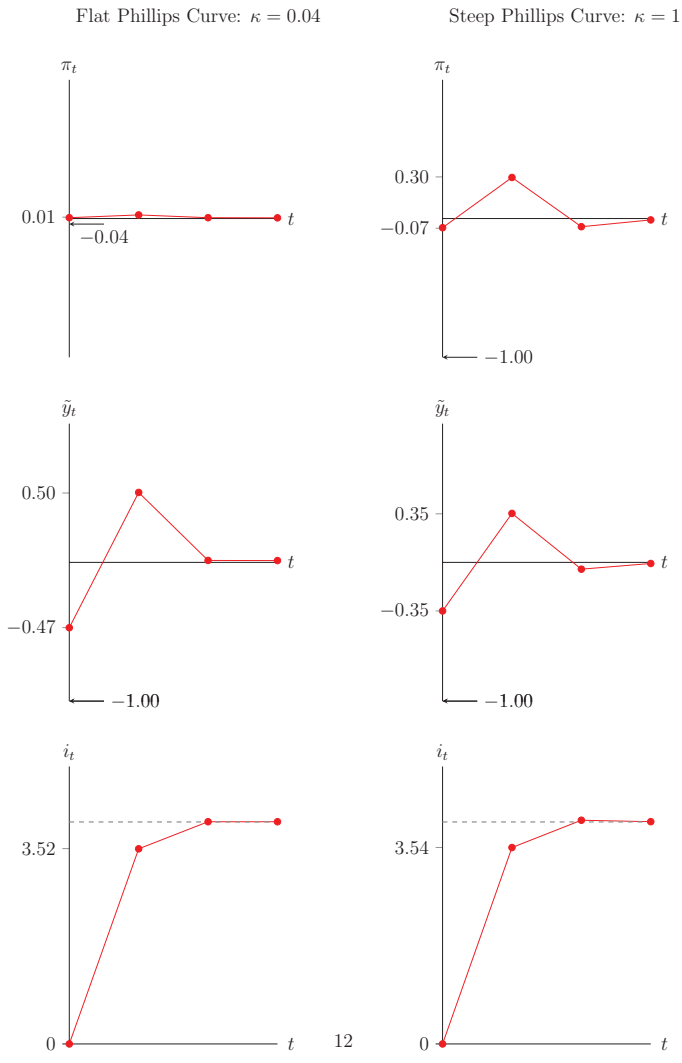
The same constraints that limit the central bank's actions in year zero also apply to future years, so this discussion of forward guidance would be incomplete if it stopped at Figure 1. To bring future years' Phillips curves and IS curves into the picture, consider the problem of a central bank in year zero choosing values for π_t, $\tilde{y}_t$, and i_t from year 0 into the infinite future. The central bank chooses these to minimise the loss function in equation 4, but the chosen sequences must satisfy the Phillips curve, IS curve, and ZLB in equations 1, 2 and 3 for *all* years. This dynamic formulation of the monetary policy problem is necessary for the full consideration of forward guidance, because it allows the central bank to quantitatively compare the current gains from forward guidance with the future costs of following through on promises made. Because Ramsey (1927) first conceived of economic policy as choosing a vector of economic outcomes to achieve the lowest social cost possible, subject to the constraints imposed by private decision-making, economists call this a Ramsey problem and its policy prescription a Ramsey solution. In this particular context, the central bank's loss function determines the social cost of specific sequences for the output gap and inflation, and the constraints imposed by private decision-making are the Phillips curve, IS curve, and ZLB.

The Ramsey outcome can be best appreciated by studying an example calculated from a particular parameter configuration. To impose a neutral interest rate of 4%, the example sets $\beta = \exp(-0.04)$. Evans (2011) discusses the numerical values for λ consistent with Fed's dual mandate of promoting maximum employment with stable prices, and the example uses his preferred value, $\lambda = 0.25$. The intertemporal elasticity of substitution, σ, equals 1; so a 1% reduction in the natural interest rate lowers the output gap's upper bound by 1%.

Figure 2 shows the sequence of output gaps and inflation rates that minimise the central bank's loss function with these parameters when a temporarily negative natural rate of interest drives the economy to the ZLB in year zero. That is, $r_0^n = -0.01$ and $r_t^n = 0.04$ for all $t \geq 1$. (The markup shock, which placed the analysis in Figure 1 into the northwest quadrant, equals zero here). The figure reports results for two values of κ, 0.04 and 1. The smaller, "flat" value of κ is of the magnitude favored by Eggertsson and Woodford (2003). It requires a 20% decrease in the output gap to lower inflation by 1%. One might judge such a large sacrifice ratio to be unrealistic, because actual disinflations (such as that engineered by Paul Volker in the early 1980s) have not generated such large output declines. The relatively large value of κ addresses this possibility.

In Figure 2, the black arrows pointing to its panels' vertical axes indicate each variable's value in year zero without forward guidance. (In all future years, the discretionary values of π_t, $\tilde{y}_t$, and i_t are 0, 0, and 0.04, respectively.) By construction, discretionary monetary policy can do nothing to mitigate the effects of hitting the ZLB. The negative 1% natural interest rate drives $\tilde{y}_0$ to −1%, irrespective of the Phillips curve's specification. The Phillips curve's slope determines the size of the associated disinflation. With the flat Phillips curve, this equals only −4 basis points, but with the steep Phillips curve inflation falls 1 full percentage point.

Figure 2 Optimal policy with one year at the zero lower bound



When the central bank instead employs forward guidance, the decline in the output gap is substantially reduced, to −47 and −35 basis points with the flat and steep Phillps curves, respectively. To achieve such moderation of the initial recession, the central bank engineers a future inflationary expansion. In year one, the output gap equals 50

and 35 basis points with the flat and steep Phillips curves, respectively. With the flat Phillips curve, inflation in year one is hardly noticeable, but it equals 30 basis points with the steep Phillips curve. More noticeable is the effect of forward guidance on year zero inflation when the Phillips curve is steep. It rises from −1 percentage point to −7 basis points. The experiments with both slopes feature very small deviations from steady state after year one, and they have nearly identical associated paths for the interest rate; by construction, $i_0 = 0$. The interest rate equals about 3.54% in year one and thereafter stays very close to the natural rate.

These numerical results illustrate two principles emphasized by Eggertsson and Woodford (2003). First, optimal monetary policy at the ZLB resembles the prescriptions of *price-level targeting* (PLT). Under PLT, the central bank announces targets for a relevant price index, such as the deflator for consumer expenditures – excluding food and energy goods – for several dates. The central bank then chooses policy in order to come as close as possible to these targets. If inflation falls short of its expected value, then the central bank deliberately tolerates a later overshooting of inflation, which brings the price level closer to its stated target. Qualitatively, this policy can be seen in the optimal inflation path with a steep Phillips curve. The deflation of 7 basis points is followed by an inflation of 30 basis points. Recall that even if the ZLB does not bind, a central bank facing an output-inflation trade-off resulting from an inflationary markup shock, would like to promise deflation in the future to move the Phillips curve back toward the origin. The inflation followed by deflation also resembles the PLT outcome. Eggertsson and Woodford (2003) provide a more extensive but similar argument that PLT should always be followed, both at and away from the ZLB.

The second principle can be seen in the accommodative interest rate in year one: optimal forward guidance promises to maintain an expansionary monetary policy *after the conditions that initially warranted it have passed.*

Conclusion

Since output remains below potential, inflation is running below the FOMC's target of 2%, and the ZLB prevents further conventional monetary accommodation, the FOMC has turned to two nontraditional monetary policy tools: quantitative easing and forward guidance. This article has shown how the latter, through "open-mouth operations" can improve current macroeconomic outcomes, by altering current expectations of future inflation and output. In the Ramsey problem, the central bank's ability to manipulate expectations is assumed to be perfect. Campbell et al. (2012) review the considerable evidence that FOMC members did indeed influence private expectations before the financial crisis and they expand upon it by showing that FOMC statements continued to move asset prices in the post-crisis period. Such influence is undoubtedly helpful for implementing forward guidance, so it seems reasonable to assume that FOMC participants have built up enough influence with the public to credibly commit to forward guidance.

This primer reviewed the *theory* of such guidance, but the question of how well the FOMC's current guidance matches that of the theory remains open. In the simple model I used to solve the Ramsey problem, the natural interest rate follows a simple predetermined path and there are no markup shocks. In practice, both the FOMC and the public face considerable uncertainty about the path of the natural interest rate. Furthermore, shocks to supply (through the markup shock) and demand (through the natural interest rate) continue to impact the economy, even though they are more pedestrian than those that caused the financial crisis. Mimicking the Ramsey solution in such circumstances would require the FOMC to specify a comprehensive rule for its interest rate decisions and associated forecasts for inflation and the output gap. In such a complex world, where the possible sources of future economic turbulence cannot even be reliably listed (not to mention quantified), such a complete solution is unrealistic.

What the FOMC has done instead is provide *target-based* guidance. The committee expects the current interest rate of approximately 0 to remain appropriate at least as long

as the unemployment rate remains above 6.5% and medium-term inflation expectations remain below 2.5%. This guidance can be consistent with the "overshooting" prescription of the Ramsey solution. Of course, the simple model presented here gives just a qualitative guide to optimal forward guidance. The more sophisticated model of Eggertsson and Woodford (2003) differs from it only by randomising the time at which the natural rate of interest permanently returns to its long-run value, so that provides hardly more quantitative guidance for the current situation. Extending this policy framework to include a more realistic random evolution of r_t^n and ongoing markup shocks is the subject of current research.

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The Macroeconomic Effects of Forward Guidance[1]

Marco Del Negro, Marc Giannoni and **Christina Patterson**
Federal Reserve Bank of New York; Federal Reserve Bank of New York; MIT

In this post, we quantify the macroeconomic effects of central bank announcements about future federal funds rates, or forward guidance. We estimate that a commitment to lowering future rates below market expectations can have fairly strong effects on real economic activity with only small effects on inflation.

Estimating the effects of forward guidance

Macroeconomists, and Federal Reserve economists in particular, face the challenge of quantifying the effects of monetary policy on the economy. Considerable research has documented the effects of surprise changes in the short-term interest rate on a wide range of economic indicators. However, for the past few years, short-term interest rates have effectively hit the zero lower bound so that the central bank can no longer lower its short-term policy rate to stimulate demand. Instead, it has resorted to other tools, such as forward guidance or changes to the composition and size of the central bank's balance sheet ("quantitative easing"). The Fed has used forward guidance extensively since the Federal Open Market Committee (FOMC) meeting on 16 December 2008, when it announced a commitment to low interest rates in the future, aiming to reduce long-term bond yields and stimulate spending throughout the economy.

In a recent New York Fed staff report (Del Negro et al. 2012), we quantify the macroeconomic effects of central bank announcements about future federal funds rates,

1 Adapted from Marco Del Negro, Marc Giannoni, and Christina Patterson, "The Macroeconomic Effects of Forward Guidance," Federal Reserve Bank of New York Liberty Street Economics blog, February 25, 2013. The views expressed in this post are those of the authors, and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System. Any errors or omissions are the responsibility of the authors.

using an estimated dynamic stochastic general equilibrium (DSGE) model.[2] Why bother with economic models to figure out the effects of forward guidance? Because looking at the behaviour of the economy in the months following a policy announcement confounds the effects of policy with a multitude of other factors that affect the economy; a model is needed to isolate the effects of policy from those other factors. A further complication arises from the fact that when the FOMC announces that it expects to keep its policy rate exceptionally low for longer than market participants had anticipated, at least two things can happen. Either the market participants understand that the FOMC intends to maintain a very accommodative policy for longer than initially thought, in which case people's expectations about economic activity and inflation should rise. Alternatively, they interpret the FOMC statement as revealing a deterioration of economic conditions, which should lead observers to lower their expectations of future economic activity and inflation (as emphasised by Campbell et al. (2012) and by Michael Woodford (2012) in his recent Jackson Hole speech). Again, a model is necessary to distinguish between these two channels.

Modelling framework

DSGE models based on the work of Smets and Wouters (2007), among others, are in principle well suited to study the effects of forward guidance. These models have been found to fit the data reasonably well and to provide a good forecasting performance relative to that of private forecasters and reduced-form models such as VARs.[3] Moreover, because these models represent laboratory economies, they can be used to study the impact of policy experiments never performed before. However, while DSGE models are in principle useful in studying the economy's response to forward guidance, they can greatly overestimate this response in practice.[4] In our paper, we explore the reasons that the model-generated estimates fall wide of the mark. We are then able to adjust our

2 If you are interested in reading more about DSGE models, follow the link, or check out this primer.
3 See Del Negro and Schorfheide 2012, and this *Liberty Street Economics* post
4 See also the evidence provided by Carlstrom et al. (2012).

model to produce reasonable estimates of the economic effects of forward guidance. In the table below, the first row in the top and middle panels shows the baseline forecast for GDP and inflation, respectively, as of 28 August 2012. These forecasts are based on data through the Q2 2012, as well as observations for the federal funds rate (FFR) and the Baa spread through the end of August. To incorporate the previously announced forward guidance, the baseline forecast is conditional on expectations that the model-implied FFR will equal actual market expectations for the subsequent eleven quarters. After that, the FFR is assumed to be set according to the policy rule that the model has estimated using data from 1984 on. The baseline forecast thus incorporates the market's interpretation at the end of August of the forward guidance provided about future FFR through the end of 2014. This implies a FFR at 0.4% at the end of 2014 and at 0.6% in mid-2015.

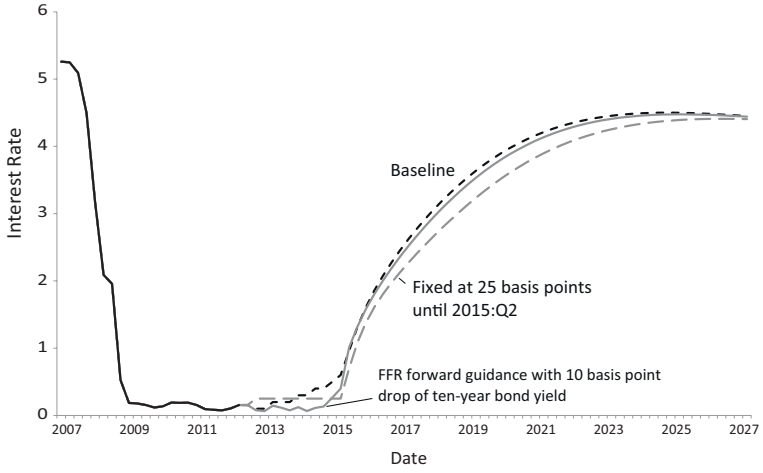
Table 1 The macroeconomic consequences of more forward guidance

	2012 (Q4/Q4)	2013 (Q4/Q4)	2014 (Q4/Q4)	2015 (Q4/Q4)
GDP growth				
Baseline	1.9	2.2	1.7	1.3
FFR at 25bp	3.5	4.9	1.5	0.3
Forward guidance with constrained 10y yield	2.4	3.0	1.5	0.9
Core PCE inflation				
Baseline	1.6	1.2	1.5	1.6
FFR at 25bp	1.8	1.9	1.8	1.7
Forward guidance with constrained 10y yield	1.6	1.4	1.5	1.6
Federal funds rate				
Baseline	0.10	0.20	0.40	1.32
FFR at 25bp	0.25	0.25	0.25	1.09
Forward guidance with constrained 10y yield	0.08	0.08	0.13	1.32

Now consider an extension of the forward guidance in the model by announcing a commitment to maintaining the FFR in the 0 to 0.25% range until the Q2 2015 (that is, longer than the market was expecting on August 28). What are the model's prediction? An unreasonably large stimulus, as shown in the second row of our table's top two panels. Under this counterfactual experiment, Q4/Q4 GDP growth would have jumped from 1.9 to 3.5% in 2012 and would reach almost 5% in 2013.

Why do we get such (implausibly) large effects? The model allows us to decompose the interest-rate announcement effects on the macroeconomy into two parts: 1) the effects of credible announcements about future short-term policy rates on long-term bond yields, and 2) the effects of the resulting change in long-term bond yields on economic activity and inflation. Is the excess response due to an over-reaction of long-term bond yields to interest-rate announcements, or to an excess response of output and inflation to given changes in long-term bond yields? The problem lies mostly in an over-reaction of long rates. The chart below shows that an extension of the forward guidance by two quarters would lead to large declines in expected short-term rates far into the future. The grey long-dashed line in the chart refers to the counterfactual experiment in which the FOMC commits to keeping the FFR low until the second-quarter 2015. It shows that, as a result of this commitment, the short-term interest rate is expected to deviate substantially from the baseline scenario for many years. Consequently, the model predicts a drop of 16 basis points in the five-year yield after the announcement, and a decline in the ten-year yield of as much as 25 basis points. These responses are, however, much larger than in recent experience. For example, following the FOMC meeting of 25 January 2012, when the Committee reinforced forward guidance by announcing that it would keep the short-term rate close to zero for an additional six quarters, five- and ten-year yields fell by only 8 and 7 basis points, respectively.

Figure 1 Federal funds rate projections further into the future



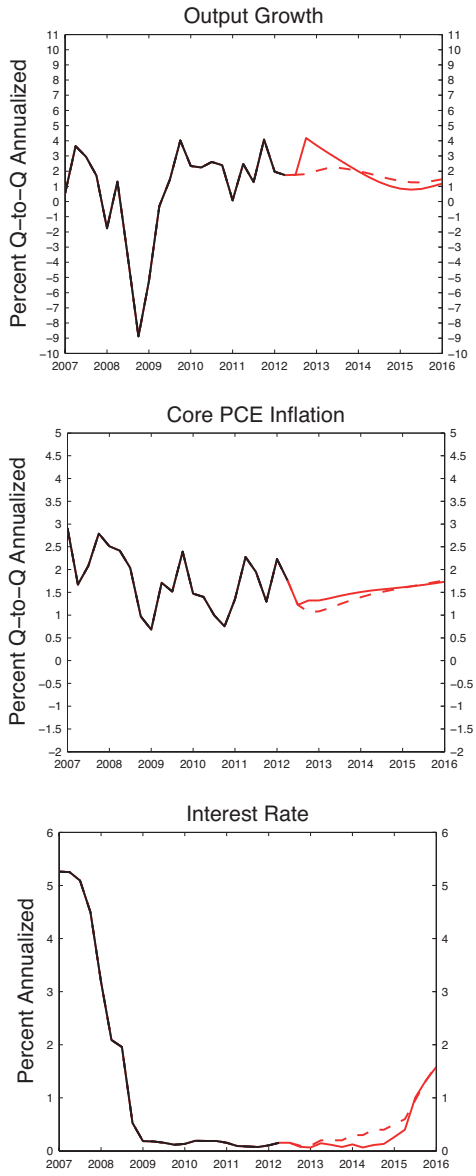
Notes: The chart shows the model's predictions for the federal funds rate (FFR) farther into the future, conditional on three scenarios: the baseline forecast as of 28 August 2012 (black dashed line); a counterfactual policy experiment in which the FFR is maintained at 25 basis points until the second quarter 2015 (gray long dashed line); and a counterfactual policy experiment in which more forward guidance is provided about the FFR such that the ten-year bond yield falls by 10 basis points (gray solid line).

Restricting long-term rates

This finding suggests that the conducted experiment does not properly capture the effects of forward guidance considered by the FOMC. A possible way to obtain more plausible responses is to recognise that forward guidance provides more information about short-term interest rates in the subsequent few years than about rates very far into the future. We thus consider an alternative experiment in which forward guidance is provided, but the path of the FFR far in the future is constrained not to deviate too much from its initial path. This path of the policy rate limits the response of the ten-year bond yield. In light of the effect of the January 2012 announcement, we view 10 basis points as an upper bound for the ten-year bond yield response to an extension of the "lift-off" date by another two quarters. When we impose this restriction on the ten-year bond yield, the model predictions become much more reasonable. The chart below shows the model's predictions for real GDP growth, core PCE inflation, and the FFR conditional on alternative assumptions about the future path of the interest rate.

The black solid lines show the historical data and the dashed red lines show the model's baseline forecast.

Figure 2 The macroeconomic consequences of fixing the interest rate path



In sum, the experiments we have conducted with the DSGE model suggest that a policy-driven shift in FFR market expectations in the next few years would have sizable, though reasonable, effects on real GDP growth, but only a modest impact on inflation.

Postscript: On 13 September 2012, the FOMC actually extended forward guidance through mid-2015, as in our counterfactual experiment. As always, controlled experiments are hard to come by in macroeconomics, and the FOMC statement of 13 September cannot – for a number of reasons – be characterised as a test of our theory. First, between 28 August (the date for which we collected market expectations for the baseline forecast) and 13 September, the employment report was released. Because the news on employment was mostly bad, FFR market expectations had already adjusted to incorporate further accommodation on the part of the central bank prior to the September FOMC meeting. Moreover, the FOMC statement also contained language concerning additional long-term asset purchases, as well as an indication that policy accommodation would continue until labour market conditions had improved. In general, it will always be hard, if not impossible, to test the predictions of DSGE models by looking at the outcome of policy counterfactuals such as the ones performed here; even if the counterfactual is implemented, it will not occur in a fully controlled environment. Nonetheless, we maintain that counterfactuals like the ones we have performed can assist policymakers in quantifying the potential effects of their policies, particularly when alternative approaches are lacking.

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The Value of Forward-Looking Communication

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The growing use of communication by central banks requires investigation of its value. This chapter presents a structural study which suggests that forward-looking communication is effective. Forward guidance retains control over inflation expectations and improves welfare. This result holds even for central banks with weaker reputations.

In May 1999, the Federal Open Market Committee (FOMC) began including explicit language about the likely future policy stance in its official statements. Since then, statements describing the expected future stance of monetary policy have become a regular feature of FOMC statements, as documented in Rudebusch and Williams (2008). From the onset of the Great Recession through the ensuing modest economic recovery, forward-looking communication by the Federal Reserve seems to have intensified. Specifically, the FOMC and its members have made several announcements about the likely duration of both the policy of near zero short-term interest rates, and the massive operations aimed at altering the scale and composition of the Federal Reserve's balance sheet.

Financial markets have strongly reacted to FOMC statements about the likely duration of the large-scale asset-buying programme the Federal Reserve is currently carrying out. Central banks outside the US have also become more determined in communicating their likely future actions to markets (Dale and Talbot 2013). This is particularly true for most inflation-targeting central banks that openly discuss the policy responses they deem to be necessary to keep inflation on track in the medium and long run (Praet 2013).

1 The views in this article are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Federal Reserve Bank of Chicago or any other person associated with the Federal Reserve System.

The growing use of communication by central banks worldwide raises the question of whether such communication aimed at signaling the likely future monetary stance is valuable. Our structural study (Bianchi and Melosi 2013) suggests that the answer to this question is affirmative.

A structural investigation

We develop a dynamic general equilibrium model to quantitatively assess the welfare implications of forward-looking communication by a central bank. We model an economy in which the anti-inflationary stance of the central bank can change over time. When monetary policy alternates between prolonged periods of active inflation stabilisation (an active regime) and short periods during which the emphasis on inflation stabilisation is reduced (a short-lasting passive regime), the model captures what has become the modern approach to monetary policy around the world, including the in the US. This approach – dubbed 'constrained discretion' by Bernanke and Mishkin (1997) – consists of two basic principles:

- First, the central bank retains some flexibility in the conduct of monetary policy in order to accommodate the effects of short-run disturbances on aggregate demand and unemployment.
- Second, such flexibility is constrained to the extent that the central bank should maintain a strong reputation for keeping inflation and inflation expectations firmly under control.

In other words, the central bank can de-emphasise inflation stabilisation provided that it does not do so long enough to lose control over inflation expectations. However, the central bank can also decide to engage in a prolonged deviation from the active regime and move to a long-lasting passive regime. This second kind of deviation is intended to capture the type of slack monetary policy conducted by the Federal Reserve in the 1970s.

Agents in the model are fully rational and able to infer if monetary policy is active or not. However, when the passive policy prevails, they are uncertain about the nature of the observed deviation. In other words, agents are not sure if the central bank is engaging in a short- or long-lasting deviation from the active regime. The central bank can then follow two possible communication strategies:

- The central bank can provide no forward guidance; that is, it does not reveal the nature of the deviation.
- Alternatively, the central bank can provide some forward guidance by signaling the actual duration of any deviation to the private sector.

When no forward guidance is provided, the longer the deviation from active policy, the more discouraged agents become about a prompt return to active monetary policy. Specifically, the longer the deviation from active monetary policy, the worse the trade-off the central bank faces. After a sufficiently long-lasting passive policy, the central bank's ability to accommodate the effects of shocks on aggregate demand without jeopardising the stability of inflation expectations becomes critically constrained.

Forward guidance and its effects on welfare

We fit the model to a US data set using likelihood methods. The estimated model shows that the Federal Reserve benefits from its strong reputation. Based on the estimates, pessimism and, hence, inflation expectations react very sluggishly in response to deviations from active monetary policy. In fact, following an adverse supply shock that the Federal Reserve decides to accommodate by deviating from active monetary policy, inflation expectations and inflation are found to move very slowly during the first five years of the deviation. However, if monetary policy remains accommodative after the first five years, inflation expectations and inflation rapidly accelerate. This finding has two important implications:

- First, in the absence of forward guidance, the model predicts that inflation drifts up for several years after a technology slowdown.

- Second, the Federal Reserve can conduct accommodative policies for up to five years before it critically loses the ability to keep inflation expectations under control.

While this second result implies that the Federal Reserve can successfully implement constrained discretion, even without providing any forward guidance to market participants, the model suggests that introducing forward guidance would improve welfare. Systematically announcing in advance the duration of any deviation from the active regime has two conflicting effects on welfare:

- First, welfare declines in the short run because agents have been told that passive monetary policy will prevail for a while and thereby future shocks are expected to have more dramatic inflationary/deflationary consequences.

It follows that if the duration of the announced deviation is long enough, over the early periods uncertainty is higher than when no forward guidance is provided.

- Second, as time goes by, agents know that the prolonged period of passive monetary policy is coming to an end, leading to a reduction in the level of their uncertainty and an associated improvement in welfare.

This is exactly the opposite of what occurs when no forward guidance is provided – agents become more and more discouraged about the possibility of moving to the active regime and uncertainty increases as the passive policy is implemented. Thus, forward guidance helps the Federal Reserve to peg pessimism down, preventing a quick deterioration in welfare.

In general, which of these two conflicting effects on welfare prevails depends on the central bank's reputation that, in turn, controls how quickly inflation expectations

and uncertainty take off in the absence of forward guidance.[2] If reputation is weak, agents will interpret the very first observed deviation as a switch to the long-lasting regime, leading to a strong and sudden rise of pessimism about future monetary policy and a fast deterioration in welfare. Therefore, the actual leeway in de-emphasising inflation stabilisation might be rather limited for those central banks that have failed to establish a strong reputation. Consequently, the adoption of forward guidance is even more desirable for central banks with a weak reputation because it helps in anchoring pessimism and uncertainty. This result extends to central banks with a weaker reputation that are unable to make fully credible announcements about their future policy actions.

One might be concerned that forward guidance may lead to an enormous welfare loss whenever a central bank needs to announce a very long-lasting passive policy. Our model suggests that this is a minor concern. When we focus on durations for passive policies that are reasonable for US monetary policy, we find that welfare gains from adopting forward guidance actually increase with the duration of passive policies. In other words, the gains deriving from the anchoring expectations dominate the loss implied by the short-run increase in uncertainty.

Concluding remarks

Forward-looking communication is a valuable tool for modern central banks and its use is likely to increase in the future. This is particularly true for those central banks that have been less successful in building a strong anti-inflation reputation than the Federal Reserve. Furthermore, the prolonged accommodative policy carried out by the Federal Reserve has currently induced some members of the FOMC to question how long inflation expectations will be firmly anchored if the Federal Reserve will not immediately start tapering its massive programme of monetary stimulus. Our study suggests that forward-looking communication is an effective tool to retain control over

2 We adopt a practical definition of reputation: a central bank has a strong reputation if it is less likely to engage in long-lasting deviations from the active policy.

inflation expectations even when a central bank needs to carry out a very long-lasting accommodation.

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Part III

Improving the Implementation of Forward Guidance

Complete Forward Guidance

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RBS Markets; University of Kent

Central banks have recently changed their communication strategies by engaging in forward guidance. This chapter describes why forward guidance is needed and how it can be improved. It argues that forward guidance should be complete. Information should be extended beyond initial interest rate changes and should instead consider the whole policy rate path.

Implicit forward guidance

Forward guidance on interest rates may be a recent addition to the policy toolkit, but communication of one form or another about future policy decisions is not. Central banks have long indulged in *implicit* forward guidance, recognising the importance of describing the future stance of policy for forward-looking agents. Pre-crisis central banks published projections for inflation conditioned on a particular path for interest rates, which signalled whether policymakers deemed that path appropriate or not. Others used code words such as 'vigilant' or 'measured' to signal the likely direction and speed of travel in policy rates (Woodford 2008). The way that central banks are expected to behave in the future will influence the constellation of financial prices today, and that in turn will shape the path of activity and, ultimately, inflation. So, whatever the modalities of the specific communication strategy, the intention was the same – to make the policy process more predictable, and thereby stabilise the economy by enabling agents to condition their plans on the central bank's path for the policy rate.

The situation demands clear communication

The debate on the need for transparency in monetary policy reflected a growing consensus that the mystique of days gone by was less than ideal. But as yet, no such

consensus exists over the optimal topic or form of conversation with the market – from the transparent (speaking about the loss function, the most likely path for policy) to the more guarded (code words and other hints about the future path of policy). We shall return to this issue of the optimal topic of conversation at the end of this chapter. But in these unusual times, a number of central banks have re-considered the cost-benefit analysis of engaging in more a fulsome discussion with markets about the future path of policy and, in particular, the circumstances under which policy rates are likely to remain at, or break free, from their current low levels.

It is hard to disagree with the proposition that the current state and future evolution of the economy is particularly uncertain at present. Given the state of the financial system, uncertainty around the transmission mechanism of monetary policy is elevated. Moreover, market participants may be unclear about the extent to which financial stability issues – whether the encouragement of risk-taking within the financial system when rates have been held too low for a long time or the impact on debt servicing costs when rates rise – weigh on the monetary policy decision. Or, for that matter, the extent to which old rules of thumb about the extent of gradualism (the lagged dependent variable in the policy rule) will still apply in a return to normal times. Furthermore, central banks have started talking more about flexible inflation targeting, which implies some willingness to accept extended deviations of inflation from target. Finally, most central banks have engaged in unconventional policy interventions alongside slashing official interest rates, and there is uncertainty about the timing and sequencing of the exit from both conventional and unconventional stimulus. This point is particular pertinent for the Anglo-Saxon central banks that have accumulated huge stockpiles of assets. Given the heightened uncertainty about the exit strategy, it makes sense that central banks would want to provide more information about the normalisation of policy rates.

Form and type of guidance

The key elements in forward guidance are the form and type of message. Like any form of central bank communication, it conveys a message about the central bank's strategy and, in particular, whether the reaction function has changed (Bean 2013). At one extreme is the form of guidance, promoted by Eggertsson and Woodford (2003), whereby central banks marooned at the lower bound indicate that they will deviate from the timeless reaction function in a future recovery in order to engineer additional stimulus today. Of course, whether such announcements might be credible, and therefore effective, is a matter of debate. In fact, given that many central banks hold large stocks of nominal debt, it might be thought unlikely that a loss-inducing boom will be acceptable. At the other extreme, central banks may wish to return to normal times in a reasonably standard manner but, given the large deviation from previous equilibrium, they may feel that certain markers to the policy path may need to be provided. One demarcation we can therefore offer is whether the form of guidance is:

- revelatory, in that it brings us new information about a change in the reaction function; or
- confirmatory, in that it re-affirms the (timeless) central bank's reaction function in extraordinary times.

The type of guidance – whether it is time-dependent, state-dependent or open-ended – has also received much attention. But any type of guidance will be subject to a host of 'knockout' or escape clauses, and so the signal that can be extracted will be subject to significant uncertainty, in which the forecast density of any stated trigger has to be combined with that of the various knockout clauses. Actually, whatever form or type of guidance is offered, it will always involve considerable uncertainty, as guidance cannot be offered unconditionally. We would therefore prefer re-writing the problem of forward guidance into the space of the likely path of the policy rate (Barwell and Chadha 2013). This will force the central bank communication strategy to turn words

and triggers into a specific path for interest rates about which escape clauses, economic news and measureable uncertainty can be expressed (Svensson 2006). Such a path will also encourage market participants to challenge the central bank's view by trading their own private views into market prices, and will also ensure that the published path at any one point is not treated as an unconditional forecast or commitment.

The problem with forward guidance

Forward guidance may be an effective way to dampen excessive volatility in asset prices that might otherwise arise due to mistaken beliefs about what would trigger the decision to start raising rates. The problem with current forward guidance is that it is incomplete; it speaks only of the timing of the first move in interest rates. Guidance is silent about what happens afterwards – how fast stimulus is withdrawn and under what circumstances – and on the critical issue of how unconventional measures, like portfolios of purchased asset, are unwound along any given path.

Beliefs about what happens after the first rate hike *matter*. They will influence asset prices and activity today. Indeed, the fragile nature of these beliefs could become an important and undesirable source of volatility as the moment of the first hike approaches. Moreover, comments about the timing of the first rate hike may signal something about the speed at which stimulus will be withdrawn after that point, whether the central bank intends it or not. The inference that market participants draw should depend on whether they heard a *confirmatory* or *revelatory* message, but a narrow conversation about the timing of the first hike does not easily encompass this deeper discussion about strategy. Likewise, it is not easy to address the uncertainty about the future path of policy, which reflects uncertainty about the outlook and the policy response both for individual policymakers and between them, within the context of guidance over the first hike.

The most effective way to address these concerns is to extend the conversation beyond the first rate hike and move away from a teleological discussion of any one noisy

indicator. Central banks should speak about the entire path back to a neutral setting in normal times within a framework that emphasises the uncertainty, which itself relates the many possible scenarios that might unwind in the coming years.

Figure 1 Projection for the level of Bank Rate

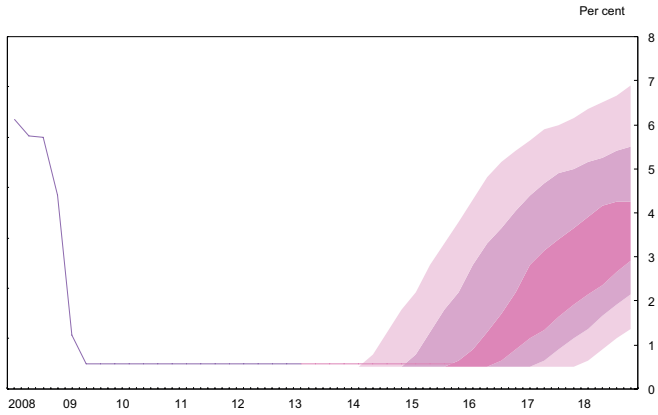
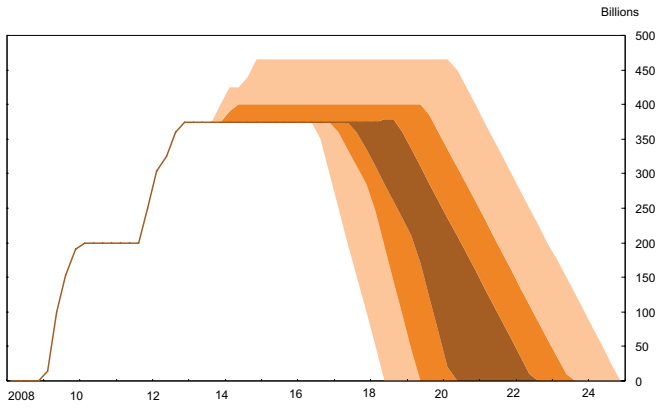


Figure 2 Projection for the stock of purchased assets (end quarter stocks)



Figures 1 and 2 use the Bank of England's favoured form of communication (the fan chart) to give a stylised example of what we have in mind – a probabilistic statement about the path of Bank Rate back to neutral and the stock of purchased assets back to zero. Published alongside the conventional counterparts for growth and inflation,

these fan charts provide the context to the nature of the central bank's guidance. The nature of the uncertainty about the outlook and the reaction function could then be teased out by publishing various scenario analyses consistent with these fan charts. This proposal does not involve spoon-feeding the market the answer on the timing of the first rate hike, but allows the central bank to educate the market about the monetary policy framework, and also provides an incentive for investors to trade their views into market prices. Monetary policy involves decision-making under uncertainty, so let us try to get central banks to portray that problem more clearly and with complete forward guidance.

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Effective Forward Guidance: Scrupulous Central Bankers and Forecast Contracts

Hans Gersbach and **Volker Hahn**
ETH Zurich and CEPR; ETH Zurich

Forward guidance has become a prominent policy instrument in the central bankers' tool box. Yet its usefulness is limited by credibility problems. This chapter outlines how forward guidance can be made more effective.

In favour of forward guidance

Central banks worldwide have experimented with forward guidance (i.e. the release of information about future policy rates). The Federal Reserve indicated in December 2012 that it anticipated that the target interest rate would remain exceptionally low at least until mid-2015.[1] Other central banks, notably the Bank of England and the ECB, have followed suit and have made announcements about the future stance of monetary policy.

The main theoretical arguments in favour of forward guidance are easily grasped:[2]

- First, the long-term interest rate is the average of the current and expected future short-term interest rates, modulo a term premium.

If the central bank influences expected short-term interest rates through forward guidance, it may successfully shift long-term interest rates and hence current macroeconomic aggregates such as investment, consumption and output.

1 http://www.federalreserve.gov/faqs/money_19277.htm (retrieved on September 29, 2013).
2 For a detailed discussion about different types of forward guidance, see Campbell et al. (2012). Detailed discussions about the rationale for forward guidance can be found in Campbell et al. (2012) and Gersbach and Hahn (2012). Magill and Quinzii (2013) have examined the third argument.

- Second, current inflation is typically affected by expectations about future inflation.

If the central bank announces that it will pursue a low-inflationary policy, it may therefore be able to influence current inflation.

- Third, using the current short-term interest rate as the sole monetary policy tool may prompt indeterminacy in the evolution of the economy.

By adding forward guidance, the central bank can anchor agents' expectations and put the economy onto the path of its choice.

The desirability of partial commitment

The arguments for forward guidance rely on the efficacy of the central bank's influence on the private-sector's expectations. This efficacy will be high only if the private sector finds announcements about future policy credible.[3] Therein lies a fundamental challenge, since the monetary policy that is optimal from today's perspective may not be optimal in the future. Addressing this challenge is not only of theoretical interest, but also of great practical importance, as the following quote from Reuters illustrates:[4]

> "…market rates have continued to rise despite the warning [by Draghi that the underlying expectations are unwarranted] and the ECB's July assurance that it would keep its policy rates at current or lower levels for an extended period of time."

An obvious explanation for the rise in market rates is that the ECB's projection of low policy rates was not considered sufficiently credible. This episode suggests that it is necessary to probe deeper into how forward guidance can work. We shall argue that some degree of commitment to forecasts is desirable.

3 See Gersbach and Hahn (2011, 2012) and Krippner and Thornton (2012).
4 http://www.reuters.com/article/2013/09/04/us-ecb-rates-idUSBRE9831A720130904 (retrieved 29 September 2013).

In Gersbach and Hahn (2011), we address this question in the context of cost-push shocks by introducing interest rate forecasts by the central bank into an otherwise standard New Keynesian model. We assume that central bankers incur some costs if they deviate from previous forecasts. These costs, if publicly known, make forward guidance credible to some extent, so that interest rate projections can be used to influence private-sector expectations. In light of unforeseen events, the central bank will make adjustments to the policy. However, these adjustments will be moderated by the central bank's incentive to keep deviations from announcements small. We show that forward guidance has plausible implications in our model: lower interest rate forecasts result in expectations of higher future inflation and output, while higher forecasts have the opposite effect. As output and inflation are affected by expectations about future economic variables in the New Keynesian model, forward guidance allows for a superior stabilisation of cost-push shocks.

The assumption that central bankers incur some costs when they deviate from their forecasts is plausible because frequent and large deviations may well cast doubt on their competence and may damage the central bank's reputation. This assumption is supported by anecdotal evidence we provide in Gersbach and Hahn (2011) and a recent empirical analysis by Mirkov and Natvik (2013), who show that the monetary policy of the Reserve Bank of New Zealand and the Norges Bank, the two central banks with the longest track record of publishing interest-rate forecasts, appears to be constrained by past interest rate forecasts.

Improving the effectiveness of forward guidance

While various factors may make central bankers unwilling to deviate from their forecasts, and so make forward guidance effective to some extent, we next explore how to exploit its full potential. We start from the observation that forward guidance produces a steady flow of interest rate forecasts, actual policy choices and outcomes that can be used to create partial commitment to forecasts. We also draw on the classic

literature on the time-inconsistency problem of monetary policy and the inflation bias. This literature has suggested three ways of alleviating the time-inconsistency problem:

- Reputation-building (Barro and Gordon 1983; Backus and Driffil 1985).
- Delegation to a conservative central banker (Rogoff, 1985).
- Incentive contracts for central bankers (Walsh, 1995).5

Reputation-building

Establishing a reputation is an important ingredient in producing a successful central bank. By establishing a track record of low inflation rates, a central bank can anchor inflation expectations. In principle, reputation might also help a central bank to make its forward guidance more credible, but there are limits here because central banks inevitably do – and should – deviate from their past projections when unforeseen developments arise. Moreover, establishing a reputation for reliable forecasts will take time.

A 'scrupulous' central banker

The classic proposal by Rogoff (1985) addresses the time-inconsistency problem through the appointment of a 'conservative' central banker, who is inherently inclined to favour low and stable inflation. An analogous approach could be used to improve the effectiveness of forward guidance. By appointing 'scrupulous' central bankers, who are intrinsically reluctant to deviate from their forecasts, forward guidance could be made more credible and hence more effective. Of course, many other factors (competence, experience, degree of conservatism, etc.) have to enter into the appointment of central bankers; focusing exclusively on their scruples will not do.

5 Following a strict rule would be another option. However, it is not clear how central banks could commit to a strict rule.

Forecast contracts

The third option is incentive contracts. Central bankers' pay (or pensions or length of terms) could be made dependent on the accuracy of their forecasts. Introducing inflation forecast contracts into a standard New Keynesian model, we show that these contracts can greatly improve monetary policy (Gersbach and Hahn 2012).6 While these forecasts involve a trade-off between the improved effectiveness of forecasts and the central bank's reduced flexibility in responding to unforeseen developments, the optimal inflation forecast contract involves appreciable rewards if inflation forecasts are met.

Conclusions

Forward guidance is no panacea.7 Nevertheless, the recent experience of central banks and the findings of our own research indicate that forward guidance may be a useful tool. We have argued that its efficacy can be enhanced further, and that incentive contracts contingent on the central bank's forecasts are a simple, yet effective measure to accomplish this.

Such contracts can be particularly useful in light of the zero lower bound. As Krugman (1998) noted, central banks that find themselves in a liquidity trap face the problem of how to commit to irresponsible behaviour, i.e. unusually high future inflation, when expectations of high inflation may be necessary to lower real interest rates and so jump-start the economy. Forecast contracts represent an easy way out of this dilemma. Central banks can simply announce higher inflation rates for some time to come. These forecasts are credible, given that the public knows it will be in the central bankers' own

6 A related proposal comes from Krippner and Thornton (2012). They propose that the central bank buy interest-rate-derivative contracts. If bought on a massive scale, deviations from previous forecasts would have harmful consequences for the central bank's balance sheet. Central bankers who care about the size of the central bank's losses would thus feel constrained by these measures. We view incentive contracts for central bankers as distinctly preferable because their incentives are direct and therefore may be less costly to taxpayers.

7 Many critical aspects of forward guidance have to be taken into account. For instance, market participants may overreact to announcements and central banks need to be able to abandon previous announcements completely in the event of crises.

interests to adhere to them. Likewise, further down the road, inflation forecast contracts will make it easier to bring down inflation after a successful escape from the liquidity trap.

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Part IV

Criticism

Forward Guidance in the UK: Holding Rates Down till Something Happens[1]

David Cobham
Heriot-Watt University

The forward guidance recently proposed by the Bank of England's Monetary Policy Committee would be the sensible approach – if the case for forward guidance were strong. This chapter argues that the case for forward guidance is weak. It highlights problems faced in communicating forward guidance and confusion concerning its perception. A more pragmatic policy is necessary in the short run; a fundamental rethinking of the policy framework is needed in the long run.

The UK's forward guidance scheme, as set out by Dale and Talbot (2013), involves the statement of the Monetary Policy Committee's (MPC) intention not to raise interest rates – or undo its quantitative easing – until unemployment falls to 7%, provided three conditions are not broken:

- The MPC's inflation forecast (18-24 months out) remains less than 0.5% above the 2% target.
- Medium-term inflation expectations remain under control.
- The Financial Policy Committee has not ruled that the monetary stance is posing a danger to financial stability.

This third condition is new, but the rest of the package is similar to what the Federal Reserve is doing.

1 When MPC member David Miles went to Newcastle to give a speech about forward guidance, a *Financial Times* reporter asked the locals what they made of it: 'Among those willing to have a stab at the key question – what is the BoE's policy on interest rates? – Ken Miller, a local shopkeeper, came up with one of the better answers. "To hold them down till something happens," he said. Quite what that "something" was remained elusive.' (*Financial Times*, 24 September, 2013).

The policy is not presented in the context of previous central bank experience of publishing interest rate forecasts (e.g. Anderson and Hoffmann 2010), or raising inflation expectations and lowering real interest rates so as to reduce the current real short-term interest rate, as in Woodford (2012).

Justifying the forward guidance. Or not?

Instead, the MPC's (2013) explanation justifies its forward guidance in terms of:

- giving greater clarity about the trade-off between the speed at which inflation should be returned to target and the speed with which economic growth recovers;
- reducing uncertainty about the future path of monetary policy; and
- allowing the MPC to explore the scope for expansion without jeopardising price and financial stability.

The MPC has gone to some lengths to explain why it has opted for state-contingent rather than open-ended or time-contingent guidance. It has gone to even greater lengths to explain why it has chosen unemployment as its activity indicator (and 7% as the threshold for it), and why it has selected its particular 'knockout' clauses. Indeed, Sections 4 and 5 of its statement (MPC, 2013) are model discussions of the complexities involved in managing an economy under widespread uncertainty and in using different types of indicator and measure.

If forward guidance is to be introduced, then this seems a sensible way to do it – one which leaves few hostages to fortune. But it is not obvious that the economic effects are likely to be significant. The designated unemployment rate is a threshold, not a trigger, while a breach of the knockout clauses would not in itself require the MPC to change its policy. In addition, these clauses are far from clear-cut:

- Inflation expectations, for example, will be monitored via a range of indicators including surveys and financial market data.

- Individual members of the MPC will make their own assessments of whether the knockouts have been breached.

Indeed, the MPC (2013, p. 22) notes that state-contingent guidance "may be less easy for the public to interpret" and may therefore have less impact on households' and firms' views about the future. It also emphasises that specifying a threshold rather than an automatic trigger can avoid rises in rates unwarranted by broader economic conditions. Thus the new information the MPC is providing about its future policy decisions is at best vague and imprecise – in which case, its impact on expectations and its contribution to the reduction of uncertainty are likely to be limited.

Two arguments in favour

One defence of the forward guidance is that:

- it provides more information not just about future policy decisions but about the MPC's reaction function; and
- it enables the MPC to indicate that policy will not be tightened as soon as recovery gets under way.

In the Great Moderation, the MPC did not have to think much about the trade-off. As pointed out in Bean (1998), the inflation variability-output variability policy frontier appeared to be sharply curved (almost rectangular), so that a wide range of preferences would lead to more or less the same point on that frontier being chosen. This meant that alternative preferences or goals did not need to be discussed (by the MPC or in the government's remit for it). Under the impact of the crisis, the trade-off choice looks much more difficult. However, it is not obvious that the same amount of clarity on the trade-off could not have been given in the ordinary way-through MPC members' speeches and statements to Parliamentary Committees.

Another defence is that forward guidance "provides a robust framework within which the MPC can explore the scope for economic expansion without putting either price stability or financial stability at risk" (p. 19). At first glance this sounds significant, and may recall discussions of the Fed's gradual but sustained stimulus to the US economy in the 1990s under Greenspan. Then productivity seemed to be rising fast and equilibrium unemployment trended downwards. But in fact, it is just a description of what monetary policymakers should be doing all of the time. And if the MPC feels it is necessary to make a formal guidance statement in order to discourage markets and private sector agents from thinking that the Bank is not serious about both price and financial stability, then it must have a low view of its own credibility.

Confusion and complexity of the forward guidance

So far the upshot has been a mix of:

- confusion – notably over Governor Carney's attempt to explain the policy to the Treasury Select Committee (Financial Times, 12 September);
- disbelief from financial markets and even firms (Financial Times, 30 September); and
- some evidence that households think interest rates will stay lower for longer (*Financial Times*, 6 September), though they may be interpreting the policy as time- rather than state-contingent.

This in turn resulted in a flurry of speeches by MPC members trying to explain and justify the policy (David Miles, Paul Tucker and Ben Broadbent, 23-24 September).

What is implied by the need for clarity about the trade-off is that the MPC has been pushed towards taking decisions concerning the goals (not just the instruments) of monetary policy. In this context, a fear of its own lack of credibility has led the MPC to:

- construct a careful set of conditions;

- escape clauses in order to make its operations intellectually defensible; and
- ward off the criticism that a non-independent Bank was going 'soft' or just doing the bidding of a government which was visibly desperate to engender more 'monetary activism'.

In effect, the MPC has been trying to spell out how it will exercise its discretion around its (short-term) goals. But the result is something so complex that those (e.g. in the financial markets) who might have been able to understand the way the MPC operates are no more certain than they were before. At the same time, the wider public seem to get only the message that interest rates will be lower so they should increase their bids for and their purchases of real estate.

There is a puzzle as to why the policymakers did not see this coming. One possible answer is that the policy was the result of an unsatisfactory compromise to a disagreement within the policy process – with the Treasury pressing for forward guidance of some kind, and MPC members struggling to make that guidance appear justifiable and responsible. But then there is a question as to why that disagreement might have occurred.

Is forward guidance the right way to go for the UK?

As Dale and Talbot (2013) point out, the UK recession has been longer and deeper than previous advanced economy recessions or banking crises, and worse than that of the Eurozone. Monetary policy reacted sensibly with interest rate cuts from late 2008 and the introduction of quantitative easing (QE) in 2009. Most economists view QE as having had significant positive effects, but which are diminishing over time (e.g. Goodhart and Ashworth 2012). Some recovery is finally taking place, but it remains limited and fragile. The government feels it cannot admit that it tightened fiscal policy too much and too early, and recognises the limits to further QE. Instead it is seeking alternative monetary instruments, and has turned to credit subsidies (Funding for Lending, Help to Buy) and now to forward guidance. But even together these do not

look sufficient to guarantee a full recovery for the UK economy, and run the risk of inflating a new housing price bubble.

What is really required is:

- a more pragmatic policy in the short term, including some kind of fiscal, as well as monetary easing, followed by
- a fundamental rethinking of the policy framework in the long term.

That should give the Bank of England some degree of explicit goal independence, subject to a price stability constraint, instead of formal inflation targeting subject to repeated government pressure for greater 'flexibility'.

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Debating the Merits of Forward Guidance

Charles Goodhart
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How does forward guidance affect the transmission of monetary policy? Is there any empirical evidence that forward guidance has real effects? This chapter argues that the existing evidence does not support the main arguments in favour of forward guidance. In particular, experience suggests that forward guidance by publication of expected policy paths is largely incompatible with a monetary system where policy decisions are taken by committees.

The most straightforward way for a central bank to give guidance on its (conditional) expectations of the future path of its own policy rate is to publish them, usually as a central component of its wider macro-economic forecast. Several central banks have been doing this in recent years: New Zealand has been doing this since 1999, Norway since 2005 and Sweden since 2007.

Three arguments in favour of forward guidance

There have, perhaps, been three main arguments for why a central bank should publish the forecast of its own official short-term interest rate path. The first is that the central bank, supported by an array of expert modellers and by macroeconomic and financial experts both among its staff and on its monetary policy committee (MPC)/executive board, should be able to better predict its own future actions in setting interest rates than anyone else. Not to make these forecasts available to the general public and market participants would, therefore, consist of a wilful withholding of useful information. It follows that in terms of transparency and proper communication, a central bank should publicly reveal its plans/forecasts/intentions. However, there is perhaps less to this argument than meets the eye. In a recent empirical study, Wen Bin Lim and I study

the forecasting capacity of central banks, focusing on New Zealand in the years 1999-2008. We find that while central bank forecasts are good in the very short run (up to two quarters ahead), they are dire at longer time-horizons (Goodhart and Lim 2011).

A second argument in favour of forward guidance, advanced by Eggertsson and Woodford (2003), is that in many circumstances long-term interest rates are more important in influencing economic decisions than short-term rates. Since long-term rates depend on expectations of future short-term rates, the publication of an expected/intended/forecast path of official short-term rates should allow the central bank to yield greater influence on long-term rates. This would, in turn, strengthen the transmission mechanism of the monetary policy.

However, this argument is tempered by the fact that the market might give undue weight to the central bank's forecast, thereby leading market participations to coordinate on the (supposedly better informed) official forecast and disregard their own private information. In such a case, the short-term market yield curve would reflect monetary policy authorities' intended policy path and provide less information than if future policy measures had remained unannounced (Morris and Shin 2005). A second concern (see Giavazzi and Mishkin 2006) is that official forecasts may turn out to be wrong, leading to substantial revisions of the preferred policy path. Such necessary revisions might, in turn, lessen the credibility of the central bank.

The third, and in my view least convincing argument in support of forward guidance is that it leads forecasts to be internally consistent. The alternative to using the central bank's own projected path would be to use the implied path taken from the money market yield curve. However, the output/inflation projections that the central bank may reach on the basis of the market's yield curve may very well be inconsistent with those that market participants themselves had in mind (see Gali 2010).

Limited empirical evidence that forward guidance matters

Notwithstanding this multitude of theories explaining why forward guidance should have real effects, existing empirical studies have so far failed to find evidence that markets coordinate on the published forward guidance of central banks. In a recent paper with Jean-Charles Rochet (Goodhart and Rochet 2011), we study the inter-relationship between surprises in the future path of official and market rates in Sweden and Norway (up to 2010). We find that the official path adjusts to market rates, rather than vice versa, except on short horizons in Sweden where there exists a two-way relationship.

The experience of weaker forms of forward guidance (such as time-contingent or macroeconomic state-contingent commitments) is broadly similar. For example, Mark Carney's time-consistent guidance in Canada in 2009 and his macroeconomic state-contingent in the UK in 2013 have been largely successful in influencing the short end of the yield curve, but have had no effect at longer horizons.

This phenomenon, I would argue, is consistent with the normal functioning of markets: i.e. market participants know that central banks make forecasting mistakes, and that they may be forced to take policy actions in reaction to unpredicted events. Pre-commitment, even if desirable, is not even really feasible, especially in a system of decision-making by committees with changing membership and political oversight.

Operational problems of forward guidance

Another major operational problem for MPCs is that the forecasting exercise is itself affected by the decision to publish the expected path of future policy. In general, the forecasting process is carried out by central bank staff while policy rates are set by the MPC. Consequently, by the time the MPC formally meets, their ability to set interest rates will have been constrained by the central bank's own forecasts. Implementing forward guidance thus inevitably shifts power from the MPC to central bank staff, in

conjunction with whichever members of the MPC are most involved in the forecasting process. External members of the MPC who do not participate in the forecasting process will find that their power in setting policy rates has been significantly reduced. This suggests that forward guidance by publication of expected policy paths is largely incompatible with a system where monetary policy decisions are taken by committees. This leaves only weaker forms of guidance based on time- or macroeconomic state-contingence. Due to a central bank's inability to forecast the future better than markets, such forward guidance is likely to be relatively ineffective in improving the transmission of monetary policy.

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Forward Guidance: A Central Bank Watcher's Perspective

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Major central banks have recently been employing forward guidance to inform the public about their future policy actions. This chapter discusses what forward guidance is and why central banks have increasingly been relying on it. It also warns policymakers of some of the potential pitfalls of forward guidance.

What is forward guidance?

In recent times, major central banks have been relying more on forward guidance in an attempt to impart more stimulus as they operate monetary policy at or near the zero interest rate bound. Forward guidance refers to the central bank providing information to the public today about the policy actions it intends to take in the future (Woodward 2008).

It has to be said that "forward guidance" is a horrid piece of jargon. The "forward" bit likely comes from the idea that central banks are "forward-looking", which is another way of saying that, in setting policy today, central banks have to form views about how they expect the economy to evolve in the future and how they expect their policy actions to impact that process. Of course, all human decision-makers are "forward-looking". "Forward guidance" might be better termed "guidance on future policy actions" or "future guidance" for short, but the linguistic battle is probably a lost cause at this point.

Credibility is crucial in inflation targeting

Forward guidance fits naturally into the "inflation targeting" frameworks adopted by modern central banks and is a natural evolution within, and of, those frameworks. As

a term, "inflation targeting" just states the obvious – central banks try to control the inflation rate. But the cornerstone of inflation targeting is the idea that the main way in which the central bank can control inflation is by working directly on the public's inflation (and other) expectations.

A game-theoretic interpretation is helpful. The central bank "threatens" to control inflation (a phenomenon that results from both the public's and the central bank's actions) and is able to do so because the public sees its threat as a credible one. Why? Because the public "knows" that the central bank has the tools to quash high inflation (e.g. by hiking the policy rate as far as it needs to) and to prevent disinflation and deflation (e.g. by cutting the policy rate to zero and, if necessary and within legal bounds, by acquiring assets held by the private sector in potentially unlimited amounts paid for by creating bank reserves) and, because of the mandate and independence that the government gives it, the incentive to do so.

Credibility is crucial – the public does not bet against the central bank's ability to control inflation because the central bank's threat is credible. Because the public forms its expectations today about future inflation based on the central bank's inflation target and because the public's inflation expectations largely drive inflation outcomes, the central bank is able to achieve its target. Or so the theory goes.

Forward guidance to narrow the information gap

But how does the public know all of this? *Because the central bank tells it.* Communication by the central bank is the key to inflation targeting, and forward guidance is one aspect of communication. The central bank needs to communicate three things:

- What it is trying to achieve (its objectives).
- How it is trying to achieve it now and intends to do so in the future (its tools, modus operandi and game plan).

- What it thinks it is up against (the state of, and outlook for, the economy).

The first two, together, contain elements of what is commonly called the central bank's "reaction function".

Forward guidance pertains specifically to the second kind of communication, but in giving forward guidance the central bank may signal changes in its objectives (or the weights that it gives to respective objectives). Examples are the Q4 2012 moves by the Federal Reserve and more recent moves by the Bank of England (Dale and Talbot 2013) to cast their forward guidance in terms of a threshold for the unemployment rate. To many this appears to signal a subtle shift in these central banks' objective functions or weights in their reaction functions.

Forward guidance may also signal changes in the central bank's outlook, which is why data-dependent forward guidance would seem to trump the terminal-date-dependent variety. In the former case, market expectations should automatically adjust as the data evolve, and generally in a way conducive to policy success, but with the latter central bank attempts to strengthen forward guidance may have the counterproductive effect of conveying negative information about the central bank's view of economic prospects and dampen sentiment as a result.

In a broad sense, forward guidance is intrinsic to, and embedded in, inflation targeting regimes. A key idea underlying the role of communication, and forward guidance in particular, is that good communication and more "transparency" can improve the efficacy of monetary policy by making it easier for the public to discern the intent and likely actions of the central bank. By reducing the amount of "noise" in this process, the central bank can better guide the public's inflation expectations.

By communicating its reaction function and its economic assessment, the central bank is giving "forward guidance" to the public, and the public can form a pretty good idea of how policy is likely to evolve, barring unexpected shocks. But forward guidance, as the term is currently commonly understood, refers to specific guidance that the central

bank gives about its likely future policy actions. The central bank could communicate its reaction function and its economic assessment, and leave it to the public to figure the rest out. Or, given that the central bank knows a good deal more about its intended likely policy actions in the future than the public does, it could try to narrow the gap (the information asymmetry) between its expectations and the public's expectations surrounding the future course of policy, by giving the public more information in the form of forward guidance.

Quantitative and qualitative forward guidance

Two kinds of forward guidance are commonly distinguished:

- *Qualitative*, such as the Federal Reserve's "considerable period", "patience" and "measured pace" guidance under former chairman Alan Greenspan (from August 2003 to November 2005), the Fed's guidance after the financial crisis (December 2008 to June 2011), and the ECB's guidance since July 2013.
- *Quantitative*, such as the Bank of Japan pioneered during its first round of quantitative easing (QE) from March 2001 to March 2006 (further refined in October 2003), the Fed's terminal-date-related guidance on the federal funds rate (from August 2011 through October 2012) and unemployment rate-related guidance from December 2012, and the Bank of England's unemployment rate-related guidance since August 2013.

Such forward guidance can, of course, pertain to the use of any of the central bank's policy tools, notably policy rates and asset purchases. Any piece of forward guidance can contain both quantitative and qualitative elements, the qualitative elements often seeking to condition the quantitative ones.

Forward guidance aims to make monetary easing more effective (stimulatory) by putting downward pressure on interest rates out the yield curve, by guiding the public's expectations of the future path of policy rates lower (QE can be thought of as doing

similar by lowering term premiums, an effect that forward guidance on QE would seek to enhance). Quantitative forward guidance, by tying the central bank's future actions to publicly observable variables, would appear to be more powerful than qualitative forward guidance in this regard. Some quantitative forward guidance, such as the ECB's guidance that "the Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time" barely rises above stating the obvious.

Pre-commitment and the paradox of communication

A key distinction relevant here is between guidance that is conditional and is not. Forward guidance, as currently practiced, falls short of the central bank "pre-committing" to future actions unconditionally. Forward guidance with pre-commitment potentially would have more powerful easing effects precisely because the central bank would be committing to behaving in a time-inconsistent manner, that is, committing to taking actions in the future that it would not find optimal to take when that future arrives. Not surprisingly, central banks are reluctant to cross this Rubicon, even when circumstances call for innovative or extreme approaches. One reason, other than such behaviour not being in the central bank's DNA, is the likely concern that "credibly promising to be *irresponsible*", as Paul Krugman colourfully put it, may have a destabilising effect on the public's inflation expectations – the very variable that the central bank is aiming to control. Another is the likely doubt as to whether it is even possible for a publically accountable central bank to pre-commit to time-inconsistent behaviour. Even if the central bank tries, it will not work if the public doubts that the current central bank can tie its future hands in advance.

That leaves quantitative forward guidance, conditioned on sensible publicly observable economic variables, looking like the next best thing to pre-commitment, and that seems to be the recent trend (of the four major central banks, the Fed, the Bank of England and the Bank of Japan are all employing quantitative and qualitative forward guidance;

only the ECB is employing qualitative forward guidance alone, see Praet 2013). But there may be pitfalls here too.

One is that, economic data being noisy, conditioning forward guidance on observable economic variables, by investing those variables with more significance than they would usually have, may infect the public's expectations formation process with noise.

Another is that enhanced central bank communication, and quantitative forward guidance in particular, may sometimes amplify rather than dampen market volatility. Exhibit A would appear to be the Fed's June 2013 refinement of its asset-purchase-related forward guidance from a qualitative to a quantitative one and its surprising (to the markets) failure to start to "taper" its open-ended monthly purchases at the September Federal Open Markets Committee meeting.

There may be a paradox of communication: more may not always be better. Monetary policy works through financial markets, so central banks need to influence the expectations and behaviour of financial market participants. The more central banks communicate, the more market participants are incentivised to listen. As well as this level of market focus being a questionable use of society's scarce intellectual resources, this may create an unintended "amplification effect". Because countless market participants focus on every incremental message from the central bank, but often react to the headline not the nuanced message, the market's reaction to a communication surprise is prone to be amplified by the fact that market participants react at the same time and, because it is a surprise, likely mainly in the same direction. The more transparent and generous with their communication central bankers become, the more they invite markets to hang on their every utterance, and the more prone markets may become to this amplification effect.

Conclusions

There is a danger that central banks, as they push the forward guidance envelope, fall prey to hubris. Central banks face (largely) the same uncertainty about the future as everyone else and central bankers are prone to the same assessment, prediction and decision failures as everyone else. Over-engineering forward guidance runs the risk of investing the central bank's communications, and the potency of monetary policy at the zero bound, with too much significance. Forward guidance aims to improve the efficacy of monetary policy, which by definition makes its effects "second-order" ones. But the very fact that monetary policy gets to the zero bound, and is thrust deep into QE territory, indicates that monetary policy itself has only second-order rather than first-order policy potency under current and recent conditions. Second-order effects on second-order effects – this is not an argument not to use forward guidance, but it does suggest policymakers should not get too carried away with it and should be attuned to any unintended consequences.

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After receiving his PhD in Japanese Economy and Master of Economics from the Australian National University, Sheard held a number of academic posts, including Lecturer in Economics at the Australian National University, Associate Professor of Economics at Osaka University and visiting positions at Stanford University and the Bank of Japan. He was a member of the World Economic Forum's Global Agenda Council on the International Monetary System (2010-2012) and in 2006 he was recognized by Advance as one of 100 Leading Global Australians. His 1997 book in *Japanese, The Crisis Of Main Bank Capitalism*, won the Suntory-Gakugei Prize.

A Long and Bumpy Journey ahead for Forward Guidance

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Central banks in developed countries have implemented forward guidance to affect the market's future expectations. This chapter suggests that forward guidance that targets the short-term interest rates has theoretical justifications but is time-inconsistent. The effect of forward guidance on the long-term interest rates is vague. The overall usefulness of forward guidance is yet inconclusive.

Many central banks in developed countries are close to the limit of their powers to stimulate their economies. Policy rates have mostly hit the zero lower bound (ZLB) and can't be lowered any further. In response, central banks have come up with a new tool – forward guidance – that attempts to affect the market's expectations of future levels of policy tools (Dale and Talbot 2013; Praet 2013). Thus, even though the current policy rate is zero, declaring it will remain at zero for a long period may affect the market's expectation of future policy rate and hence today's medium- to long-term interest rates. The practice has recently spread to forward guidance of large-scale asset purchases (LSAP) or quantitative easing (QE).

Forward guidance has required the use of new types of reaction functions by the central banks. Only by offering a different reaction function than the one the market has in mind can the central bank affect expectations. This poses an inherent question of how one can determine such a new reaction function in a theoretically correct way, if the central bank was behaving in an optimal manner in the first place. The answer must be that we are in a world of non-conventional monetary policymaking that requires a new central bank behaviour. Yet, the less-than-satisfactory nature of the theory of central banking in such a situation, and the sheer amount of information processing required under forward guidance, have led to unfortunate failures of communication between

the central bank and the market. Forward guidance has also compounded some of the traditional difficulties of policymaking, such as:

- rules versus discretion; and
- decision-making in committees by consensus versus majority.

In fact, these problems may have been an important cause of the unwanted market volatility surrounding the Fed's decision not to taper LSAP in September 2013. In some other cases, the market did not respond at all to forward guidance.

The discussion of forward guidance as a strategy to offer a new reaction function could be divided into:

- attempts to affect expected future short-term rates, i.e. forward guidance of the policy rate; and
- attempts to affect the premium component of long-term interest rates, i.e. forward guidance of LSAP.

Of course, some central banks have used forward guidance of LSAP or QE for the purpose of affecting expected future short rates as well. So, the suggested division is for the sake of convenience only.

Forward guidance and the policy rate

When the Bank of Japan (BOJ) was confronted with the ZLB, it resorted to using forward guidance of the future policy rate, perhaps for the first time in the history of central banking. In April 1999 it revealed a new reaction function by promising to keep a zero overnight rate "until deflationary concerns are over." Medium- to long-term rates moved lower in response.

The theoretical foundation of such a strategy appeared in the work of Krugman (1998) and Woodford (1999). Essentially, by promising to keep a zero rate until the economy

no longer requires it, the central bank can generate inflationary expectations and stimulate aggregate demand today. If Max (the Taylor rule rate, zero) describes the usual central bank's reaction function to the macroeconomic environment, the central bank can generate easing effects by offering a new reaction function to the market with a promise of a longer period at the zero rate than the above rule suggests. To the extent that the Taylor rule represents an optimal response of the central bank to macroeconomic environment, however, this forward guidance strategy amounts to "irresponsible" central bank behaviour. In other words, the strategy is time-inconsistent. This means that when the economy no longer requires a zero rate, it is better to raise the interest rate, reneging on the promise made. If people foresaw this ex ante, however, the strategy would become ineffective. Thus, the central bank would be sending a confusing signal if it was using forward guidance in this sense and insisted that it was still behaving in a "responsible" way. Also, the central bank does not seem to get much mileage out of a vague promise, such as the maintenance of a low policy rate "for an extended period," unless there is much confusion in the market as to where the policy rate would go in the short term.

The BOJ seems to have faced the time-inconsistency problem in 2000. The economy appeared to be recovering well and deflationary forces from demand weakness were close to over. The BOJ discontinued forward guidance and raised the policy rate. In the event, the economy deteriorated sharply and deflation became more serious in response to the global recession of 2001-02. "Deflationary concerns" were probably not over in the middle of 2000, but the desire for policy normalisation prevailed. The credibility loss forced the BOJ to strengthen its promise to "until CPI inflation was stably above zero," when it resorted to forward guidance again in 2001.

Despite such repeated use of forward guidance and other policy measures, Japan's CPI (net of energy and food) has been negative for one and a half decades. One can see another weakness of the strategy here. It requires the expectation of a strong economic recovery sometime in the future through forces other than the forward guidance of the policy rate itself. Without it, the promise of a zero rate until it is unnecessary is

useless. This implies that after a long period of deflation, the strategy may not be very effective as due to the depressed nature of the public's expectations about the future of the economy.

Forward guidance and long-term interest rates

Forward guidance of QE/LSAP has also been used. In fact, the BOJ's 2001 promise, discussed above, was about the maintenance of the QE framework introduced then. Given that QE involved positive excess reserves, it also was a promise of a zero rate. The Fed has recently forward guided its LSAP by saying that asset purchases will be continued "until the outlook for the labour market has improved substantially in a context of price stability."

At the ZLB, the short rate itself cannot be used to stimulate the economy, unless the central bank affects expected future short-term rates by forward guidance. This is not true of LSAP. Opinion is divided on the effectiveness of LSAP. Curdia and Woodford (2010) argue that LSAP would be ineffective if there were no market imperfections and people saw through the veil of the government. There are, however, market segmentations, and people may not be fully rational. So, LSAP could be effective, but if LSAP is effective, it should be so even without forward guidance. Presumably, central banks have tried to enhance the effects of LSAP on the economy through forward guidance. It is, however, unclear what has been achieved by this.

Unfortunately, there is no good theory of market imperfections. Given the short history of LSAP, there is not much accumulation of evidence on the effects of LSAP on asset prices/ the economy. Evidence on the effects of twist operations on the yield curve is relevant, but very inconclusive. There is practically no reliable way to write down a state- contingent reaction function for LSAP. Central banks have had to proceed in a trial-and-error manner in determining the amount and duration of its usage. Some market participants placed faith in central bank announcements regarding their LSAP usage, but were later disappointed by changes in the central bank reaction functions.

Maybe what central banks can at best say, is that they want to end LSAP either:

- more or less at the same time as they end a zero rate; or
- slightly earlier, if the costs of LSAP are deemed larger than those of a zero rate.

But in the latter case, there is no scientific way to determine the optimal time between the end of LSAP and the beginning of rate hikes. Thus, the market was obliged to make hedges against future rate hikes when the Fed hinted at tapering during the May-August 2013 period.

Concluding remarks

It is unclear whether the forward guidance of LSAP has helped either markets or central banks. Whatever promise central banks can make regarding LSAP will necessarily be very rough, leaving much room for discretion. Hopefully, there will be more accumulation of evidence and development of theory on LSAP to allow a more rigorous approach in the future.

As pointed out, forward guidance of the policy rate is on a slightly more solid theoretical footing, but suffers from the serious problem of time-inconsistency. Time will tell if central banks honour their promise and let inflation surge beyond target, if temporarily, or decide to renege on their promises.

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Forward guidance is the practice of communicating the future path of monetary policy instruments. Such guidance, it is argued, will help sustain the gradual recovery that now seems to be taking place while central banks unwind their massive balance sheets. This eBook brings together a collection of contributions from central bank officials, researchers at universities and central banks, and financial market practitioners. The contributions aim to discuss what economic theory says about forward guidance and to clarify what central banks hope to achieve with it.

With contributions from: Peter Praet, Spencer Dale and James Talbot, John C. Williams, Sayuri Shirai, David Miles, Tilman Bletzinger and Volker Wieland, Jeffrey R Campbell, Marco Del Negro, Marc Giannoni and Christina Patterson, Francesco Bianchi and Leonardo Melosi, Richard Barwell and Jagjit S. Chadha, Hans Gersbach and Volker Hahn, David Cobham, Charles Goodhart, Paul Sheard, Kazuo Ueda.

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