Orsolya Csortos, Kristóf Lehmann, Zoltán Szalai: Theoretical considerations and practical experiences of forward guidance[1]*

The communication of monetary policy has changed substantially in recent decades as central bank transparency has become ever more widespread. This increase in central bank transparency arose from the need for the accountability of the newly independent institutions and also from the recognition that, in addition to policy instrument changes, monetary policy can also influence economic developments by shaping expectations. In the financial crisis of recent years, several central banks' base rates have approached the zero lower bound, which intensified the importance of forward-looking communication, as the shaping of expectations has remained the only instrument for conventional monetary policy to use in its effort to implement the additional easing necessitated by the state of the economy. Another approach, less widespread in the international literature as of yet, holds that the expected real interest rate cannot be lowered and current expenditure thus stimulated by raising inflation expectations; forward guidance can, however, keep long-term nominal yields low and prevent real interest rates from rising and bond markets from reacting excessively through normalisation. We take a look at the practice of, and experiences from, forward guidance during the crisis through the example of the Federal Reserve (Fed) and the European Central Bank (ECB). Based on our findings, although the strategic importance of this type of communication instrument may wane after the crisis, there has been an undeniable shift towards communicating monetary policy assessments of, and responses to, the prevailing conditions, and thus towards a greater transparency in the operation of central banks.

THE SIGNIFICANCE OF CENTRAL BANK FORWARD GUIDANCE

'*Saying what you do and doing what you say*' is the basic principle of credible and transparent central bank operations.[2] This is necessary because a transparent central bank can shape expectations more effectively (for instance by anchoring inflation close to the target), thereby improving the efficiency of monetary policy by buffering the real economic costs of inflation shocks. Managing expectations is an important transmission channel, since consumption and capital investment decisions tend to depend on longer-term (real) interest rates, which are impacted by the current level of base rates only to a limited extent. Expectations for the base rate path and the medium-term inflation outlook play a dominant role in determining yields over the longer term. Shaping short-term interest rate expectations also influences long-term rates, which in turn has an effect on the real economy in the present. Accordingly, a more proactive management of expectations can increase the efficiency of monetary policy measures without hitting the zero lower bound (ZLB), as more distant points in the yield curve may shift in the way desired by the central bank. If the central bank is able to shape these, then – provided that the economic agents are forward-looking at least in part – it will be able to exert influence on the current real economic and inflationary processes as well.

Accordingly, transparent central bank operation and clear communication became increasingly widespread even before the onset of the crisis, with the role of forward guidance subsequently gaining even greater significance once the zero lower bound was reached. Consequently, it has become a widespread practice for central banks to publish the details of their monetary policy strategies, their target variables, their decisions and the main arguments for the same, along with their view of the expected future development of the economy. In normal times, this allows economic agents to deduce from the previous decisions and the systematic behaviour of the central bank how it would respond to various economic processes and shocks. However, if uncertainties surrounding economic prospects increase, the role of communication on the future conduct of monetary policy grows more important as economic agents face unfamiliar situations on the one hand and the zero lower bound restricts leeway for monetary policy

* The views expressed in this article are those of the author(s) and do not necessarily reflect the offical view ot the Magyar Nemzeti Bank.

[1] We wish to thank several of our colleagues for their suggestions and especially Zalán Kocsis for his useful comments.

[2] "Saying What You Do and Doing What You Say" (Friedman–Laxton, 2009).

on the other hand, rendering it increasingly difficult for central banks to shape expectations for monetary conditions.

THEORETICAL CONSIDERATIONS UNDERLYING FORWARD GUIDANCE

In advanced economies, central banks are **generally characterised by transparency in their operations**, offering market participants a clearer picture of what behaviour they can expect from monetary policy-makers. If a central bank is focused on price stability, market participants' interest rate expectations will be determined by what central bank base rate path they believe will ensure that the inflation target can be achieved at the declared monetary policy horizon. It may serve as a significant factor in shaping these expectations if a central bank publishes its forecasts and makes the considerations supporting its monetary policy decisions publicly available. Although the transparency of operations makes central bank behaviour more predictable, this does not always guarantee that the expectations of market participants will be aligned with the intentions of the central bank. Beyond the credibility of the central bank, this also presupposes that market participants think similarly to the central bank when it comes to the macroeconomic factors and outlook determining monetary policy and the appropriate responses to the same by central bank decision-makers. If there is no such similarity in thinking, then the central bank may harmonise the expectations of market participants and central bank's intentions by giving explicit signals of the expected future path of the base rate.

The most common form of forward guidance adopted by the best practice inflation-targeting central banks is **forecast-based forward guidance.** Forecast-based forward guidance gives a signal of the most probable monetary policy response at the given information base. Thus, in an ideal case, even the more remote points on the yield curve will move as intended by the central bank.

Forecast-based forward guidance may take the form of mere verbal signalling of the expected future path of interest rates (e.g. the direction of future steps or the expected steepness of the interest rate path), but it may also incorporate the publication of an interest rate path consistent with the central bank's macroeconomic forecast (the latter is feasible if the forecast is prepared assuming an endogenous monetary policy response[3]). The central banks that publish the entire interest rate path (e.g. Sweden, Norway and New Zealand) consider it important to emphasise that the interest rate path published is merely a forecast based on the currently available information base and therefore it should not be considered a promise or any kind of commitment. By doing so, they create the possibility of deviating from the originally forecasted interest rate path without a loss of credibility in the event of unexpected future shocks. Some special cases, however, warrant some level of commitment in forward guidance on future action.

Such cases include scenarios where economic conditions and the previously applied reaction function would warrant further monetary easing, but the policy interest rate has already reached the zero lower bound and cannot therefore be lowered any further. In such circumstances, low inflation (or deflation) may be coupled with an excessively high real interest rate, leading to a further fall in aggregate demand and a further widening of the negative output gap. The central bank may alleviate this by providing **commitment-based forward guidance**, i.e. for instance by announcing that it will keep the policy rate low even at the expense of tolerating a temporary deviation from the inflation target, thus generating inflation expectations and reducing the real interest rate. Lower real interest rates boost the economy by bringing consumption spending forward and stimulating investments.

The key difference between forecast-based and commitment-based forward guidance is that the former involves the central bank disclosing information about the expected outcomes of its customary strategy, whereas the latter aims to achieve its effects via the temporary suspension of the usual strategy. Commitment-based forward guidance typically stipulates some kind of condition, as no central bank wishes to commit over the long term to a strategy it would not consider optimal under normal circumstances. Central banks employing commitment-based forward guidance generally formulate time-contingent conditions (time-contingent commitment) or conditions predicated on the state of the economy (state-contingent commitment); in either case, the forward guidance may be open-ended or specified. It is important to note here that a time-contingent condition makes it ambiguous whether the central bank's forward guidance is forecast-based or commitment-based, since signalling that a certain interest rate level will remain in place until a given date does not reveal if this means that the central bank is acting in accordance with its customary strategy or if it seeks to increase its effectiveness through a temporary deviation from the same.[4] It is also important to

[3] This means that the path of interest rates and exchange rates is determined endogenously so that inflation develops in line with the inflation target on the horizon considered relevant by monetary policy.

[4] The signals of a central bank will have different consequences depending on which category economic agents assign them to. Signalling a base rate remaining near the zero lower bound for an extended period may send the message that the central bank expects protracted economic weakness, but may also suggest that the interest rate level will remain low even after the recovery has started. The former message may dampen economic activity whereas the latter may stimulate it.

note that a central bank deviating from its usual strategy faces a dilemma: first, the effectiveness of its measures depends on whether market participants will believe its commitment to temporarily departing from its strategy given the exceptional circumstances and, second, if a central bank deviates from its previously announced strategy excessively or for too long, this can easily lead to a weakening of the long-term anchoring of inflation expectations.

Central banks face **numerous other challenges** when implementing forward guidance in practice. Even if a central bank is able to convince economic agents that its forward guidance is commitment based, definition of the time horizon will not make it clear which variables should change as a precondition for suspending the central bank's guidance. Commitment in such cases raises the issue of time inconsistency, when the central bank promises behaviour that is optimal in the present day but may easily feel tempted to deviate from the proclaimed strategy as time passes and the economic circumstances change. This problem is in part remedied by state-contingent guidance, in which the central bank predicates maintaining the commitment on changes in certain macroeconomic variables. However, selecting suitable indicators for the state-contingent guidance may still present a problem, along with the definition of their long-term equilibrium levels. And if the set of conditions are overly complex, the clarity and therefore the efficiency of the guidance may weaken. In addition, the diverging opinions of, and communication by, central bank decision-makers regarding the development of economic processes may also diminish transparency and credibility, and therefore the efficiency, of the guidance. Finally, it should be remembered that the use of forward guidance may indirectly cause stability risks.

THE RELATION BETWEEN FORWARD GUIDANCE AND BOND MARKET REACTIONS

Most analysts and economic policy-makers have welcomed forward guidance as a new communication instrument of central banks in the crisis. The interpretations discussed above hold that the main objective for a central bank that has approached the zero nominal lower interest rate bound is to reduce the expected real interest rates by *raising inflation expectations to near the target* and thus stimulate the economy through the expectations channel. Another approach holds that *the expected real interest rate cannot be lowered and current expenditure thus stimulated by raising inflation expectations*; forward guidance can, however, keep rises in long-term nominal yields under control and prevent real interest rates from suddenly rising and bond markets from reacting excessively through normalisation. This approach highlights the role of forward guidance in mitigating bond market uncertainties linked to the beginning of the tightening cycle and in preventing the panic-driven selling of bonds. The current problem facing central banks is highlighted by the global bond market crisis triggered in 1994 by the Federal Reserve's tightening cycle,[5] when interest rates were held level for five years and then in February 1994 the Fed raised the policy rate by 25 basis points to 3.25 per cent. There was a frantic response on bond markets, including in countries whose central banks had not raised the interest rate, which surprised market analysts and the Fed alike.[6]

Having learnt from the trauma of the 1994 bond market crisis, the Fed reassured bondholders right at the start of a similar rate hike cycle in 2004–2006 that it would implement the hike in small incremental steps and take care to minimise the losses of holders of bond portfolios financed by credit. The Taylor rule comprising purely macroeconomic indices (GDP and inflation) would have suggested a faster hike of interest rates, but bond market considerations and the need to keep long-term yields stable made the Fed's decision-makers cautious. Accordingly, forward guidance was used, with the FOMC[7] declaring that monetary policy accommodation might be maintained "*for a considerable period*". The Fed's transparent and credible communication successfully calmed deflationary risks and alleviated bond market tensions; nevertheless, the persistence of easy monetary policy may have contributed to the build-up of imbalances ultimately leading to the onset of the 2008 financial crisis.

In the current situation, the Fed and similar leading central banks want to avoid bond market crises similar to those in the past, triggered by an insufficiently prepared tightening cycle. Several factors today indicate that potential bond market losses could exceed those of the 1994 crisis:

- The stock of bonds at present is many times greater than the stock in 1994.
- The stock is more sensitive to interest rates as the current stocks were accumulated at interest rate levels that were

[5] See Turner (2013) for a detailed description.

[6] According to the BIS report for the year, the fundamentals and the inflationary pressure did not substantiate such a rise in yields at all. The Fed finally managed to control the inflation expectations and yields started to fall in 1995. However, stabilising the yields took much longer than expected. According to estimates at the time, the rate hike cycle caused a loss of USD 1.5 trillion (thousand billion) on the global bond markets, equal to almost 10 per cent of OECD GDP at the time.

[7] Federal Open Market Committee, the chief decision-making body at the Federal Reserve.

low for extended periods. In its 2013 annual report,[8] the BIS estimated that holders of US Treasury securities (excluding the quantity held by the Federal Reserve) would lose more than USD 1 trillion if yields were to rise by 300 basis points across the maturity spectrum of the yield curve. This amounts to 8 per cent of US GDP. A similar calculation reveals that holders of French, Italian, Japanese and UK government securities would face losses equal to 15 to 35 per cent of their GDP (Chart 1).

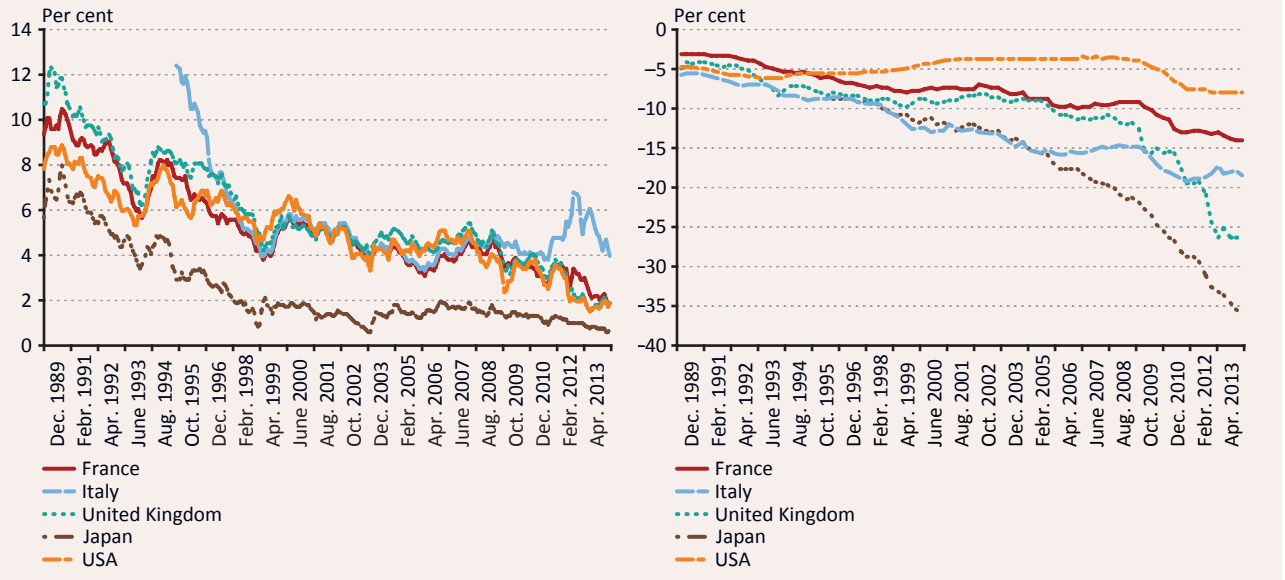
- The available information suggests that ownership is fairly concentrated, clustering primarily in the financial sector. Furthermore, in the US alone the stocks of bonds other than central bank bills that market participants hold are many times greater today than the stocks during the 1994 crisis.
- Growth was sufficiently robust at the time of the 1994 bond market crisis to help the economy out of the impasse; today, however, it is questionable whether growth is resilient enough.

Taken together, these factors mean that investors could potentially react far more sensitively to even a smaller interest rate hike. Box 1 contains a numerical example to illustrate the sensitivity of bonds to interest rates.

The risks could be aggravated if other shocks due to an absence of substantive recovery in the economy (e.g. supply-side shock, rising inflation expectations) nevertheless forced a rate hike. Forward guidance seeks to mitigate the probability and spread over time the occurrence of the prevailing larger risks, making it easier for economic agents to tolerate them. If a rate hike cycle is timed well and starts only when the recovery is sufficiently robust, the participants exposed to the risk will be able to offset their losses in other lines of business (e.g. shares, loans, etc.). If, moreover, forward guidance successfully delays the adjustment, market participants will have further leeway to absorb their losses without causing a major macroeconomic shock.

In view of all of the above, decision-makers face a dilemma concerning the period of normalisation after the current highly accommodating monetary policy. In the recent long period of low yields, investors have increased the ratio of longer-term and higher-yield bonds which are however exposed to interest rate risk, and generated demand for such new issues. Most of them have borrowed considerable sums at low interest rates to assume the positions, which is another strong transmission channel between changes in short-term interest rates and long-term yields. For instance, when, at the start of a rate hike cycle, they expect short-term interest rates to rise, they will sell their longer-term securities to minimise their capital losses on bonds. In extreme cases of mass sell-offs, this may lead to default by institutional

Chart 1
Bond yields and interest rate risk
10-year government bond yields* Changes in government securities portfolio values following yield increases, as a percentage of GDP**



** Monthly average.*
*** For each country, the estimated change in the value of government securities as a percentage of GDP following a hypothetical rise by 300 basis points.*
Source: BIS calculations.

[8] BIS (2013), p. 8.

Box 1

The interest rate sensitivity of bonds

Modified duration (MD) is used to express the change in the market price of bonds and other fixed-interest securities in response to a change in market interest rates. The market price of a bond is in fact the discounted present value of the cash flows generated from it. This present value changes each time market interest rates change, which is used in the discounting. The size of the change, however, will not affect every bond in the same way: the same change in market interest rates will have a larger impact on longer-term bonds and on bonds that pay lower interest.

Take for instance the US Treasury bond ISIN US912828B667, maturing on 15 February 2024 and having a nominal value of USD 100,000,000, which pays 2.75 per cent coupon twice a year and has a modified duration (MD) of 8.4. This means that if market interest rates were to increase from the 2.48 per cent prevailing on 20 May 2014 to 3.48 per cent, the bond price would fall by 8.4 per cent. In Table 1, we present the impact of bond features on sensitivity to interest rates by altering the parameters of a bond similar to the above. In normal times, interest rates rise less on the longer than on the shorter maturities of the yield curve in an interest hike cycle, which mitigates the loss in value of the bond portfolio; the example of 1994 illustrates, however, that a parallel shift of the yield curve, representing all the maturities, is not impossible under certain circumstances.

Table 1
The sensitivity of a hypothetical bond to interest rates

Bond	Maturity (years outstanding)	Coupon (twice a year)	Modified duration (MD)*	The market value of a bond of USD 100 market value if the interest rate rises by 100 basis points
1.	10	2.75	-8.7	91.3
2.	10	5.0	-8.1	91.9
3.	10	10.0	-7.3	92.7
4.	20	2.75	-15.4	84.6
5.	30	2.75	-18.4	81.6

**Modified duration expresses the percentage change in bond price in the event of a 1-percent (100-bp) rise in interest rate triggering an equivalent parallel shift of the yield curve.*

The modified duration formula: $MD = -\frac{D}{1+\frac{r}{f}}$; where *D* is the duration, *r* is the market yield and *f* is the number of interest payments per year. The duration in the formula, known as Maculay duration, is the discounted present value of the bond's cash flows (interests and final principal repayment), weighted by the times at which individual cash flows are due. The formula: $D = \sum_{i}^{n} t_i \cdot \frac{PV_i}{V}$, where *n* is the total number of cash flows, *i* is the sequence number of individual cash flows, *t* is the number of years outstanding until individual cash flows, *PV* is the present value of the individual cash flows and *V* is the sum of the present values of cash flows (which is the market price). We use *r*, the market yield, as the discount rate to calculate the present value. The present value of a coupon for amount *c*, payable in one year is $PV = \frac{c}{1+r'}$ if the annual interest is *r;* the present value of the coupon due in two years is $PV = \frac{c}{(1+r)^2}$, if the market interest rate remains *r* in the second year as well, etc.

Note: For the sake of simplicity, we disregarded the fact that duration provides only an approximate estimate as it offers only a linear approximation of the non-linear correlation between market interest rate and bond price. In practice, convexity will modify the exact value of sensitivity, but for illustration purposes this difference is negligible.

capital market participants, intensifying the tensions on the bond market and ultimately leading to a potential halting of macroeconomic recovery.[9]

Under this approach, the role and the mechanism of forward guidance differs from what is presented in the section above: expected real interest rates cannot be decreased by

[9] This approach has failed to gain wider currency so far because the models used to date have disregarded the possibility of default by bond market participants (and have often failed to incorporate even financial variables or a financial intermediary system). Recently, however, Feroli et al. have designed a model in which a bond market participant may default, similarly to a commercial bank, even if it had not relied on credit to finance its portfolio.

elevating inflation expectations to central bank's target, as rising inflation expectations would dampen the expected real yields of existing bonds and push the long-term yields of newly issued ones upward on bond markets, which could trigger a wave of sell-offs of existing bonds.[10] Especially in the economies based on capital markets such as the United States or the United Kingdom, a rise in yields would make recovery very difficult due to the rise in borrowing costs for corporations and could, in an extreme scenario, even prevent a recovery.[11] This view thus posits that the goal of Federal Reserve and Bank of England decision-makers with forward guidance is not to raise inflation expectations and thus reduce real yields, but rather to curb the rise in long-term nominal yields and thus prevent excessive bond market reactions in the course of the normalisation of interest rates.

FORWARD GUIDANCE PRESENTED THROUGH THE PRACTICE OF THE FEDERAL RESERVE

Similarly to the best practice inflation targeting central banks (e.g. the central banks of Sweden and New Zealand), the globally dominant Federal Reserve had already been making efforts to achieve transparent operations and credible communications a number years before the financial crisis. Accordingly, it has published statements following its decisions since 1994. In addition, three weeks after each meeting, it publishes the minutes of the meeting, which record the FOMC's decisions and present in detail the underlying considerations. Since 2007, FOMC members have provided quarterly projections of the key economic indicators. These are instruments of communication forming part of the **general clarity and transparency of the central bank**.

Forward-looking communication by central banks took on even greater importance following the onset of the global financial crisis.[12] In the case of the Federal Reserve, this is attributable to the fact that it had reduced the base rate to the 0–0.25 per cent band in December 2008, and, having thus reached the effective lower bound, it did not have the opportunity to carry out further cuts. At this point, it tried to implement further monetary easing by implementing unconventional tools, **reinforce forward guidance and** make a shift towards **commitment-based forward guidance**.

From then on, the FOMC used **time-contingent forward guidance**; accordingly, it first communicated that the interest rate band near zero would be maintained '*for some time*'. Then, from March 2009 onwards, it projected this exceptionally low interest rate "*for an extended period*". In August 2011, it **specified the former open-ended time-contingent forward guidance**, replacing the expression "*for an extended period*" in its statement and declaring that it would maintain the interest rate at this level "*at least through mid-2013*". Subsequently, in January 2012 it extended its commitment to near-zero interest rates "*at least through late 2014*" and then in September 2012 "*at least through mid-2015*". In the meantime, the Fed also decided in January 2012 that it would publish the conditional interest rate projections of the decision-makers in order to efficiently manage expectations.

In December 2012, the time-contingent forward guidance was replaced with (an also specified) **state-contingent forward guidance**, which stipulated that an interest rate level near 0 would be maintained, subject to reaching certain explicit macroeconomic thresholds. According to the forward guidance, this exceptionally accommodative monetary policy would be maintained at least as long as the unemployment rate remained above 6.5 per cent, inflation did not exceed 2.5 per cent and long-term inflation expectations continued to be well-anchored (Evans rule). The 6.5 per cent threshold would not, however, inevitably trigger an interest rate rise: if allowed by the inflation expectations or outlook, the accommodative monetary policy may be maintained further. While the guidance contingent on the unemployment threshold is in line with the Fed's dual mandate, the quantified inflation condition suggests a willingness on the part of the Federal Reserve to deviate from its previously customary strategy of targeting 2 per cent inflation.[13] At the same time, specifying the anchoring of inflation expectations as a condition communicates the

[10] This argument was elaborated by Jan A. Kregel against Krugman's view, who had similarly recommended that the Bank of Japan should raise inflation expectations to escape the liquidity trap (Kregel, 2000). Currently a number of economists (Stein, 2013; Feroli et al., 2014) are working on building models that contain fewer simplifying assumptions than the earlier macroeconomic models and are able to explain the seemingly excessive response of the bond markets to even minor increases in interest rates. In these models, bond market prices are highly influenced by the expectations regarding future growth: news impacting these expectations triggers the repricing of all the bonds already on the market, and new issues are then adjusted to the prices of the large stock of bonds already on the market.

[11] There are two types of risks related to this (Bernanke, 2013): if central banks keep base rates low for too long, then additional financial risks may build up, as yield-hungry investors buy even more long-term bonds exposed to interest rate risks (based on research by Jeremy C. Stein). The other risk concerns the start of yields rising, as an early increase in yields prevents recovery. The latter may be avoided by employing, among other things, the instrument of forward guidance.

[12] The Fed had used the instrument of forward guidance before the 2008 financial crisis, specifically when it started the rate hike cycle in 2004; see the preceding section.

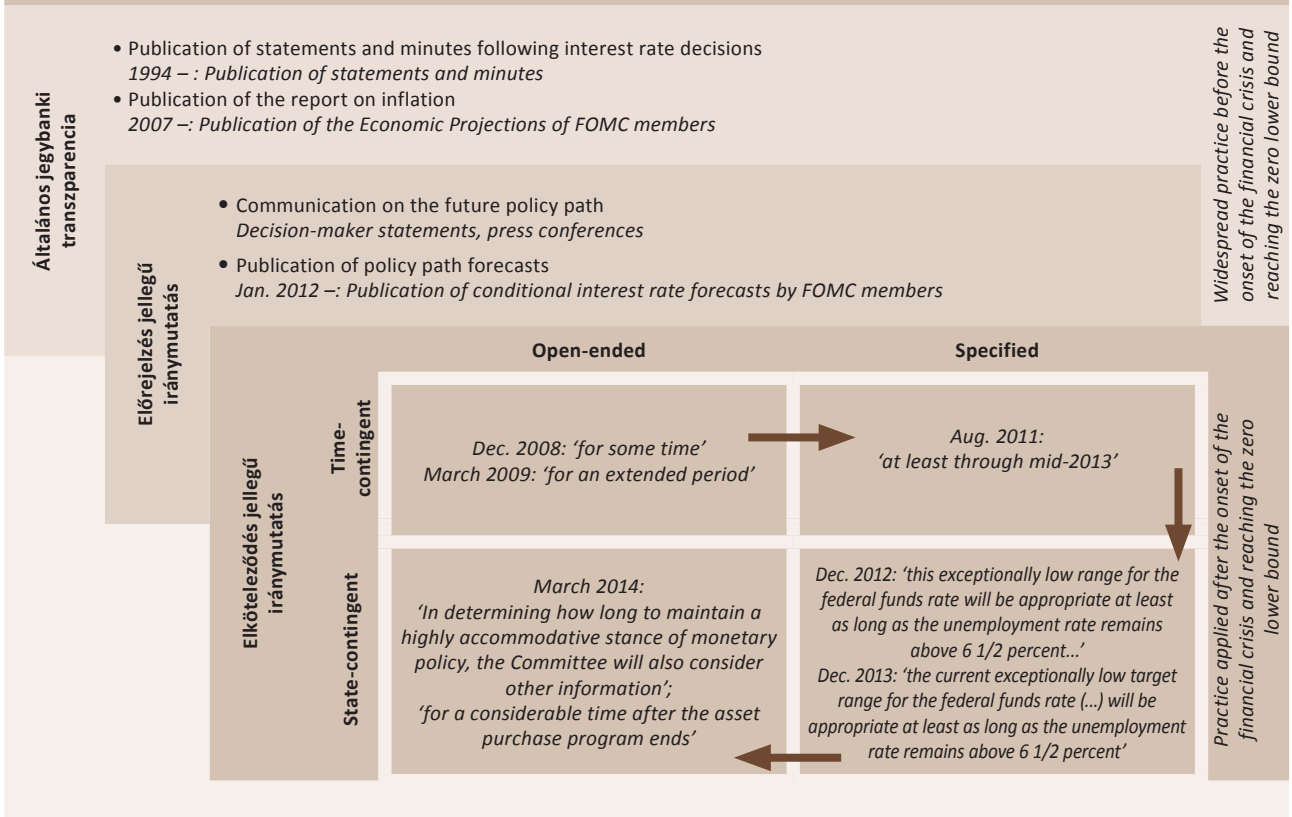
[13] In January 2012, the Board of Governors of the Federal Reserve announced an explicit inflation target of 2 per cent. The statement released at the time confirmed that the Fed continued to consider fulfilling its dual mandate, i.e. achieving price stability and full employment, as its main goals.

message that the deviation must not be more than temporary. One year later, in December 2013, with the unemployment threshold stated in the forward guidance approaching, Federal Reserve chairman Ben Bernanke declared that the current Fed interest rate target of near zero (0–0.25 per cent) will probably remain in effect *well* after the unemployment rate falls below 6.5 per cent, especially if the expected inflation rate remains below 2 per cent on the longer term. This did not represent a substantial change in the future monetary policy stance.

Under the chairmanship of Janet Yellen, appointed to this post as of 1 February 2014, the Fed changed its forward guidance again in March, although it emphasised that this did not reflect a change in the FOMC's assessment of the situation. The forward guidance was modified: the policy rate would remain at the current low level even after the asset purchases[14] have been phased out. The Federal Reserve will decide potential future interest rises on the basis of the changes in a number of determinants and will take into account, above and beyond the labour market conditions, inflationary pressures and inflation expectations, as well as the financial processes: its **state-contingent commitment has thus become open-ended**.

We have seen therefore that the Fed used several different types of forward guidance, which also highlights the practical challenges inherent in providing guidance. During its use of time-contingent forward guidance, the Fed was criticised repeatedly on the grounds that the frequent modifications of the guidance reveal the deterioration in FOMC members' assessment of the economic situation, which may in turn motivate economic agents to increase their savings rather than bring their spending forward, as they see the continued challenges. The use of state-contingent commitment was intended as a remedy to this problem, but it also provided guidance concerning only a specific value of a selected variable. Firstly, selecting the right indicator (GDP growth, unemployment rate, different labour market indicators) proved to be a challenge and, secondly, even after selecting the indicator, the Fed faced the problem that the selected variable did not adequately reflect capacity utilisation in the economy. Many, including Fed decision-makers, pointed out that the changes in the unemployment rate underestimated the unutilised capacities in the economy, because its fall was attributable largely to the decline in the activity rate, even as new job creation and other employment indicators continued to remain below levels considered to be favourable. And

Chart 2
Various forms of central bank communication and forward guidance presented through the Fed's practice



[14] In December 2013, the Fed started reducing the monthly amount of its asset purchases. It cut the monthly budget for this programme from USD 85 billion to USD 45 billion in the period between December 2013 and May 2014.

finally, state-contingent forward guidance also fails to declare how the policy rate will change once the thresholds are reached; communicating this has been one of the greatest recent challenges for the Fed.

FORWARD GUIDANCE USED BY THE EUROPEAN CENTRAL BANK

The Governing Council of the European Central Bank has published forward guidance since July 2013 regarding the future path of policy rates based on the inflation outlook. The introduction of forward guidance to the ECB's communication represents a substantial change, as it is no longer concerned solely with the economic outlook and risks but also signals the future direction of economic policy on basis of such. The trigger for this announcement was the significant increase in financial market volatility from late May in the wake of the Fed's communication of tapering, as a result of which the slope and the long end of the yield curve increased considerably. This increased financial market volatility signalled that future expectations for ECB policy rates have become overly sensitive to shocks not dependent on European economic conditions but financial market developments and the associated uncertainties. All of this pointed towards a tightening of monetary policy in spite of the ECB's cut in the policy rate in May 2013.

To respond to these trends by increasing the effectiveness of its monetary policy, the ECB first provided forward guidance in July 2013, stating that the key policy rate would '*remain at present or lower levels for an extended period of time*'. In November 2013, the guidance was maintained and the policy rate reduced; in January and February 2014, the earlier guidance was confirmed. After its March meeting, the ECB highlighted certain variables that might play a role in determining the future direction of monetary policy (e.g. unutilised capacities). Accordingly, applying the earlier categorisation we find that the ECB guidance was first open-ended time-contingent and subsequently open-ended state-contingent.

The ECB's forward guidance has a number of objectives. First, after reaching the zero nominal lower bound it sought to ease monetary conditions by committing to keeping the policy rate permanently low. The ECB committed itself to keeping the policy rate low for longer than could have been expected from its past behaviour (response function). In doing so, it wanted to reduce long-term interest rates via the expectations channel. In addition, the policy rate forward guidance may help reduce financial market volatility and thus increase the efficiency of monetary policy.

The ECB's forward guidance, however, was subject to numerous criticisms, which may have contributed to the limited effectiveness of this tool. By giving open-ended time-contingent guidance the ECB had given itself sufficient flexibility to deviate from its announced strategy, but it disclosed too little information regarding the extent of its commitment, which may have significantly weakened the efficiency of this communication tool and limited its ability to deliver the intended impact. It encountered similar obstacles with the guidance it employed subsequently: even though it was (open-ended) state-contingent, this guidance did not offer additional information on the change in the monetary policy reaction function, i.e. the variables analysed, the threshold values and the determinants triggering future changes in the direction of monetary policy.

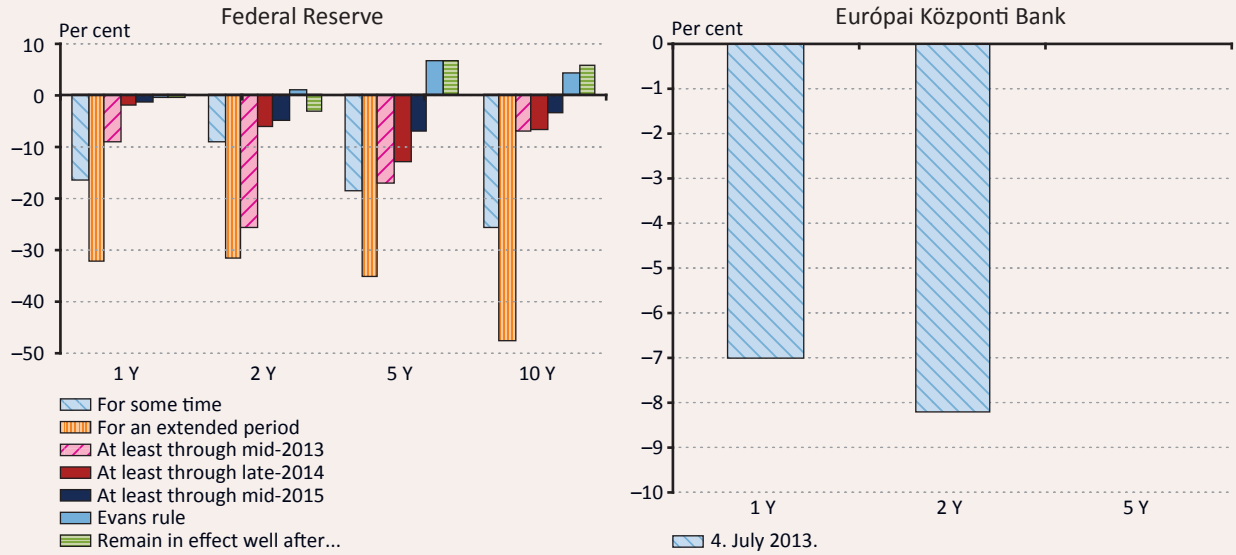
EXPERIENCES FROM FORWARD GUIDANCE

One key subject in the March 2014 BIS Quarterly Review (Filardo–Hofman, 2014) was the analysis of the efficiency of forward guidance as used in the recent period by the ECB, the Bank of England, the Bank of Japan and the Federal Reserve. Forward guidance of the key policy rate path can influence financial markets and economic processes through three channels.

In the first channel, theoretical considerations suggest that forward guidance may influence the future expected short-term interest rates as well as long-term bond yields. The results showed that while guidance did in fact have some impact on the expectations of the future path of short-term interest rates and long-term bond yields (interest path expectation component), the impact varied for each central bank over time and depending on the guidance method employed (Chart 3). In the case of the United States, for instance, short-term and long-term expected yields tended to decline on most announcement days. The Fed's announcements of qualitative[15] forward guidance triggered the most intense reactions; it is important to note, however, that these reactions may have also reflected the announcements of actual policy rate cuts as well as asset purchases. The market effects of commitment-based, time-contingent forward guidance decreased over time. Announcements of state-contingent guidance had no measurable impact; on the contrary, their impact on longer yields was undeniably

[15] According to the categorisation in the study, forward guidance is qualitative if it does not provide detailed quantitative information about the future path or the time horizon of the policy rate (e.g. 'the base rate will remain at its current level for an extended period'). In our categorisation, this classifies as open-ended guidance.

Chart 3
The impact of forward guidance announcements on three-month interbank and government bond yields



Note: The values presented are calculated as the end-of-day value on the announcement date minus the end-of-day value on the day before the announcement. For the Federal Reserve, the three-month eurodollar yields and the 10-year nominal bond yields, for the ECB, the three-month Euribor futures yields are plotted.
Source: Bloomberg, BIS calculations.

unfavourable. Underlying this may be the fact that the Fed's state-contingent commitments meant a change in the central bank reaction function, which may have an unfavourable impact on predictability over the longer term or jeopardise the anchoring of expectations (see Box 2). Nevertheless, the parallel impacts of announcements of asset purchases must be taken into account in these instances as well. According to the BIS study, the announcement of the European Central Bank's forward guidance in July 2013 was able to reduce one-year and two-year futures rates by approximately 7 and 8 basis points, respectively. According to an ECB study (ECB, 2014), however, longer-term interest rates continued to rise temporarily in the period after the guidance was announced, but as the announcements of the Fed's quantitative easing came to an end, the long-term interest rates started to fall once more and five-year yields were eventually reduced to their level of early May 2013.

Overall, forward guidance had an immediate impact on expected futures yields, but the impact varied over time. There are a number of factors, however, that case studies of this kind do not take into consideration: for instance, the decreasing impact over time can be attributed to the fact that the behaviour of the central banks became increasingly predictable for market participants. Furthermore, they did not incorporate a control for events that may have had an impact on futures rates (e.g. the announcement of asset purchases), therefore major conclusions should not be drawn from these.

In the second channel, forward guidance should reduce the volatility of expectations for the future base rate path, since this is a tool that provides additional information on this subject. The results indicate a decrease in the volatility of short-term expectations, but only a slight contraction in the volatility of longer-term ones. This suggests that markets interpret the base rate forward guidance of certain central banks as a commitment for a limited period. The ECB's own calculations suggest, however, that its July guidance successfully reduced the market uncertainty surrounding futures rates.

Finally, the impact of forward guidance on the sensitivity of financial variables to diverse economic news is also a valuable subject for research. Experience from the United States suggests that the financial markets respond differently to information concerning the indicators in a state-contingent commitment if guidance is provided. In the case of intuitively efficient state-contingent guidance, the market interest rates should not respond (too) sensitively to news that is less relevant for the objective of the central bank or even confirm the central bank's assessment of the situation. In the case of the Fed, it was found that one-year futures yields responded less sensitively to certain labour market news. The relation, however, changes over time, and the volatility of the interest futures will grow as the indicator approaches the threshold value in the guidance. The ECB's experience demonstrates that the use of forward guidance has helped

Box 2

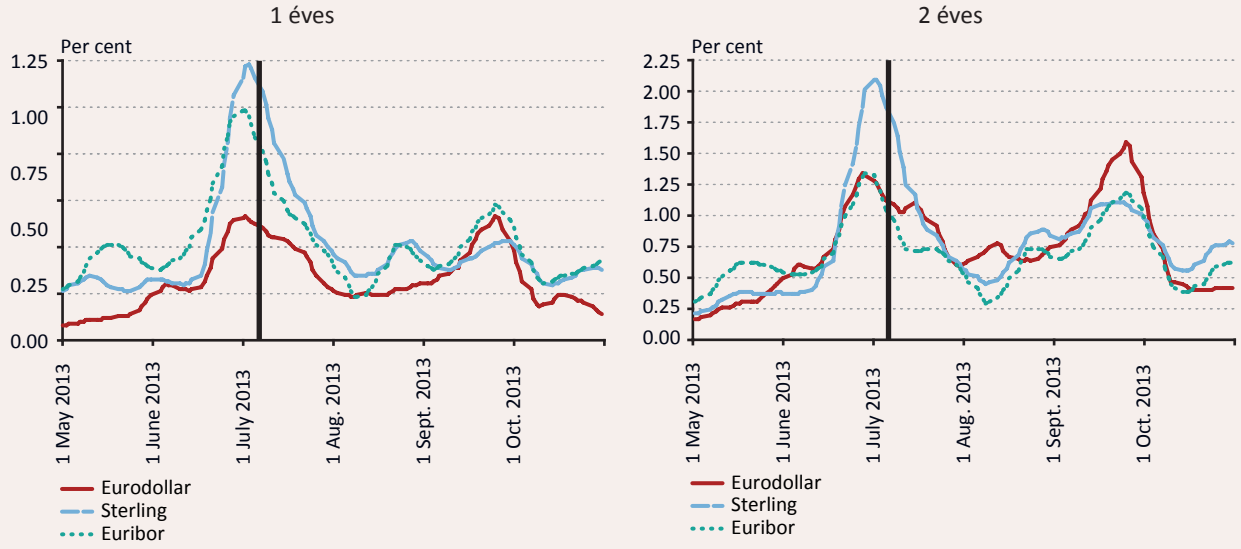
The relation between forward guidance and the various yield curve components

Regarding the first channel, one must remember that financial market (long) yields are of key importance from a central bank and economic policy point of view as indicators of market expectations, risk perceptions and monetary conditions. According to finance literature, two factors determine a market's yield level: the market's expectation of the interest path and the term premium. Forward guidance may impact the changes in both these determinants. Forward guidance can influence the expected yield level via the channel of providing information on the central bank's expected interest policy, the determinants of the same (its assessment of the macroeconomic situation) and the responses given (central bank reaction function). The term premium can also be subdivided into two sets of factors: a component linked to the uncertainty of yield expectations, and the liquidity and structural factors. In terms of the two, forward guidance plays a role in reducing the uncertainty of yield expectations, since transparent communication by the central bank may, in addition to its direct influence on the expected yield, reduce the term premium by increasing the predictability of the central bank reaction function.

The importance of this function rose following the onset of the financial crisis, as central bank reactions to news of economic developments have become harder to predict, leading to an increase in term premiums. It is this type of uncertainty that forward guidance, besides influencing the central projection in the most probable scenario, is intended to reduce and thus to increase predictability (Horváth et al., 2014).

The impact of forward guidance may differ depending on the type of uncertainty it is to reduce. If the communication is intended to reduce uncertainty regarding the reaction function and the future expected interest rate path, then the term premium component will decrease and cause primarily the short-term yields to fall, while longer-term yields may also, although to a lesser extent, shift downwards – in which case the impact is less marked. If the forward guidance provides information about a change in the central bank's reaction function, then market expectations for the interest rate path will change and yields will shift downward accordingly. This too will lead primarily to reduced shorter yields, but an increase in long-term yields is more likely here, due to the uncertainty surrounding the frequent modification of the reaction function or the damage to the anchoring of inflation expectations.

Chart 4
Three-month inter-bank interest rate volatility in 2013



Note: The vertical line designates 4 July 2013, when the ECB gave open-ended state-contingent guidance.
Source: Bloomberg, BIS calculations.

decouple European financial market developments from the Fed's communication of tapering. This is clear from the following: when the Fed started its communication of cutting back its asset purchases ('tapering talk'), the ECB was not using forward guidance and the volatility of European interbank interest rates grew considerably together with the US rates. At the end of the summer, however, when the ECB was already providing its forward guidance, the volatility of European interbank interest rates grew only moderately while US interbank interest volatility returned (the same is true for the increase in UK interbank interest rates) (Figure 4). Furthermore, the ECB's own calculations also reveal that the sensitivity of financial market yields to the incoming data and the information less tied to the outlook in the euro area was lower after the announcement of forward guidance.

CONCLUSIONS

As the recovery continues, one of the questions for the period following the crisis will be whether forward guidance is to remain part of the regular monetary policy toolkit. Some experts posit that increasing transparency is merely a continuation of the trend that began prior to the crisis, which has recently gained momentum and garnered more attention. Under a different approach, the forms of forward guidance applied in the recent past are part of the unconventional monetary policy toolkit used during the crisis and their implementation will not be needed under normal economic circumstances. International experience and our research reveal that forward guidance was widely adopted as a communication tool during the crisis and has become an integral part of the monetary policy toolkit. Although the strategic importance of this communication tool may decrease following the crisis and a loss of relevance of the zero lower bound, the experience of past years shows that the tool has improved the efficiency of monetary policy and is therefore likely to remain part of the monetary policy toolkit.

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