Monetary Economics

# Chapter 4: Forward Guidance

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# Goal of the chapter

- A bad enough economic situation (i.e. low enough inflation rate and output gap) may call for a negative short-term nominal interest rate.

- However, the interest rate is constrained to be higher than its **zero lower bound** (ZLB) or **effective lower bound** (ELB), because private agents always have the alternative option of holding (zero-interest-paying) cash.

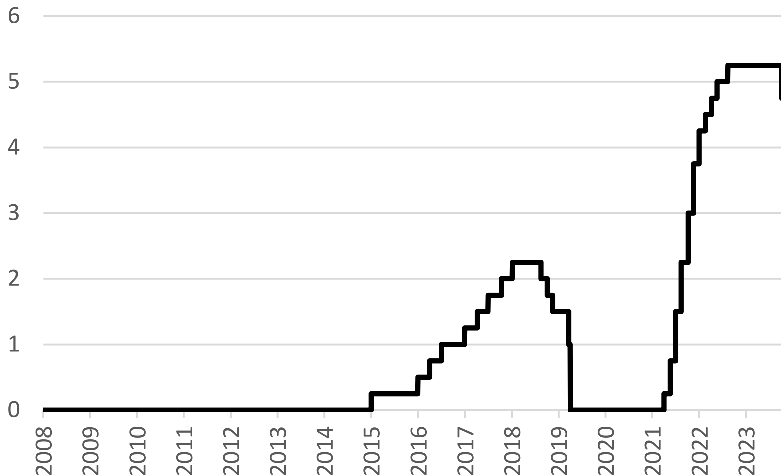
- On those occasions, CB has to resort to **unconventional MP measures**.

- One of them is **forward guidance**, i.e. communication about future short-term nominal interest rates.

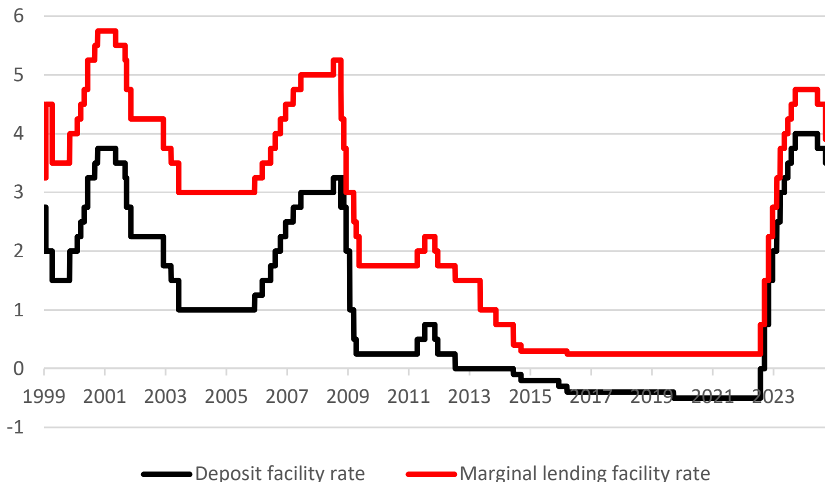
- This chapter
  - analyzes the role of forward guidance in the basic NK model,
  - illustrates this role with various real-world examples.

# Federal Funds target rate (2000-2008)

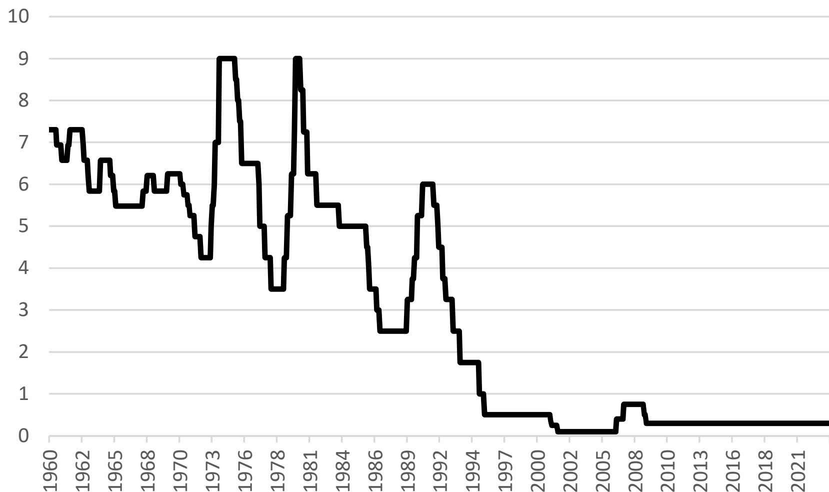
# Lower limit of Federal Funds target range (2008-2024)



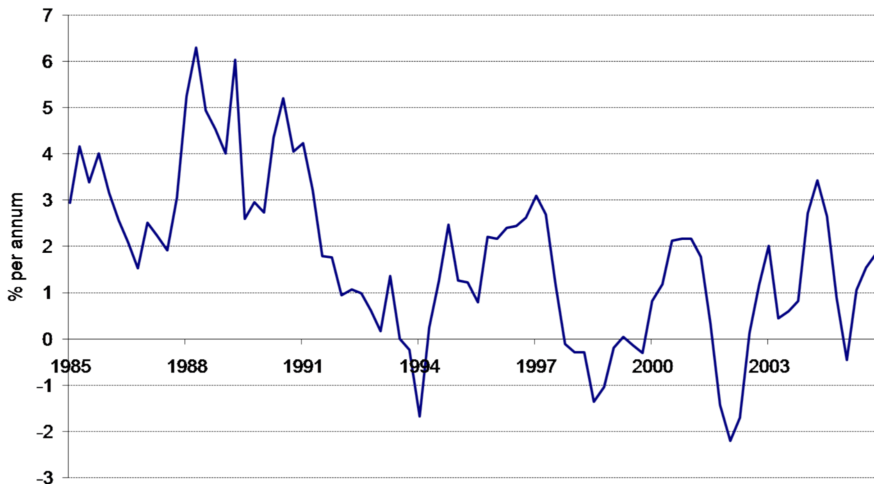
# Key ECB policy rates (1999-2024)



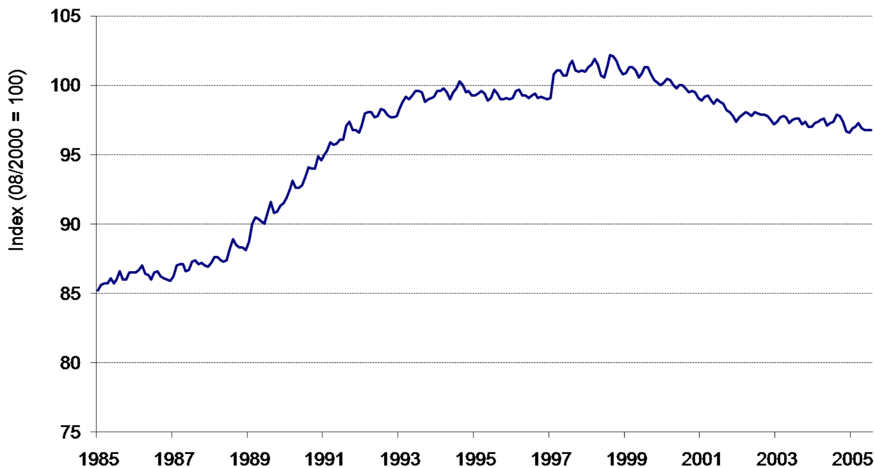
# Bank of Japan's policy rate (1960-2023)



# Real GDP growth in Japan (1985-2005)



# Consumer price index in Japan (1985-2005)



# Outline of the chapter

1. Forward guidance in the basic NK model
2. Illustrations:
   - Bank of Japan, 1999-2003,
   - Federal Reserve, 2003-2004,
   - Federal Reserve, 2008-2016,
   - Bank of Canada, 2009,
   - European Central Bank, 2013-2014,
   - European Central Bank, 2016-2024,
   - Federal Reserve, 2020-2024.

# Assumptions

- Consider again the **basic New Keynesian model**.
- Assume, following Eggertsson and Woodford (2003), that
  - there is no steady-state inefficiency ($x^* = 0$),
  - there are no cost-push shocks ($u_t = 0$),
  - the economy is at the steady state until date $-1$ included,
  - there exist $s \in (0, \infty)$ and $q \in (0, 1)$ such that $r_0^n = -s$ and, $\forall t \geq 1$:
    - if $r_{t-1}^n = -s$, then $\Pr(r_t^n = -s) = q$ and $\Pr(r_t^n = r) = 1 - q$,
    - if $r_{t-1}^n = r$, then $\Pr(r_t^n = r) = 1$

    (so the average duration of the shock is $1/(1-q)$ periods),
  - the approximations around the steady state remain nonetheless valid.

# Resulting reduced form

- The **structural equations** and **welfare-loss function** are:
  - IS equation: $\widetilde{y}_t = \mathbb{E}_t\left\{\widetilde{y}_{t+1}\right\} - \frac{1}{\sigma}\left(i_t - \mathbb{E}_t\left\{\pi_{t+1}\right\} - r_t^n\right)$,
  - Phillips curve: $\pi_t = \beta\mathbb{E}_t\left\{\pi_{t+1}\right\} + \kappa\widetilde{y}_t$,
  - welfare-loss function: $L_t = \mathbb{E}_t\left\{\sum_{k=0}^{+\infty}\beta^k\left[\pi_{t+k}^2 + \lambda\widetilde{y}_{t+k}^2\right]\right\}$.
- Given the **zero lower bound** for the interest rate ($i_t \geq 0$), the double objective $(\widetilde{y}_t, \pi_t) = (0, 0)$ can no longer be achieved.
- As in Chapter 2, we proceed as if CB, at each date $t$,
  - directly controlled not only $i_t$, but also $\widetilde{y}_t$ and $\pi_t$,
  - observed the history of the exogenous shock $\left(r_{t-k}^n\right)_{k\geq 0}$.

# Optimal monetary policy under discretion

- Under **discretion**, at each date $t \geq 0$, CB chooses $i_t$, $\widetilde{y}_t$, and $\pi_t$ to minimize $L_t$ subject to the IS equation, the Phillips curve, and the ZLB constraint.

- Equivalently, at each date $t \geq 0$, it chooses $\widetilde{y}_t$ and $\pi_t$ to minimize $L_t$ subject to

$$\begin{aligned}\widetilde{y}_t &\leq \mathbb{E}_t\left\{\widetilde{y}_{t+1}\right\} + \frac{1}{\sigma}\left(\mathbb{E}_t\left\{\pi_{t+1}\right\} + r_t^n\right), \\ \pi_t &= \beta\mathbb{E}_t\left\{\pi_{t+1}\right\} + \kappa\widetilde{y}_t.\end{aligned}$$

- One then gets
  - $i_t = 0$ as long as the shock lasts,
  - $i_t = r$ as soon as the shock ends.

# Optimal monetary policy under commitment

- Under **commitment**, at date 0, CB chooses the state-contingent path $(i_t, \widetilde{y}_t, \pi_t)_{t \geq 0}$ to minimize $L_0$ subject to the IS equation, the Phillips curve, and the ZLB constraint.

- Equivalently, at date 0, it chooses $(\widetilde{y}_t, \pi_t)$ for all $t \geq 0$, as a function of $(r^n_{t-k})_{k \geq 0}$, to minimize $L_0$ subject to

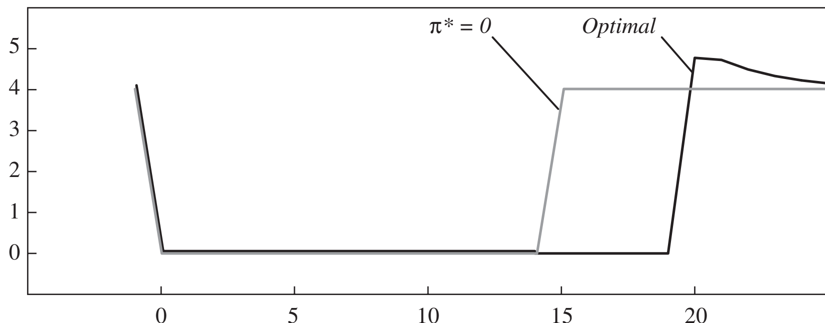
$$\begin{aligned} \widetilde{y}_t &\leq \mathbb{E}_t \{\widetilde{y}_{t+1}\} + \frac{1}{\sigma} \left( \mathbb{E}_t \{\pi_{t+1}\} + r^n_t \right), \\ \pi_t &= \beta \mathbb{E}_t \{\pi_{t+1}\} + \kappa \widetilde{y}_t, \end{aligned}$$

  for all $t \geq 0$.

- One then gets $i_t = 0$ for longer than the duration of the shock.

# Interest-rate response under optimal MP

Response of $i_t$ to a fall in $r_t^n$ below zero for a period of fifteen quarters

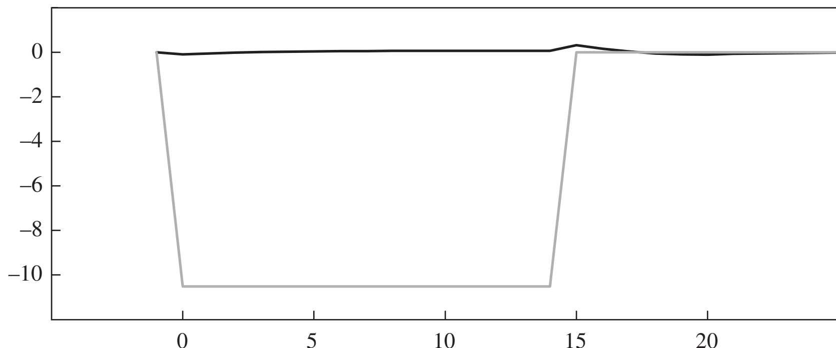



"$\pi^* = 0$" refers to optimal MP under discretion, "Optimal" to optimal MP under commitment.

Calibration: $\beta = 0.99$, $\sigma = 2$, $\kappa = 0.02$, and $q = 0.9$. Source: Eggertsson and Woodford (2003).

# Inflation response under optimal MP

Response of $\pi_t$ to a fall in $r_t^n$ below zero for a period of fifteen quarters

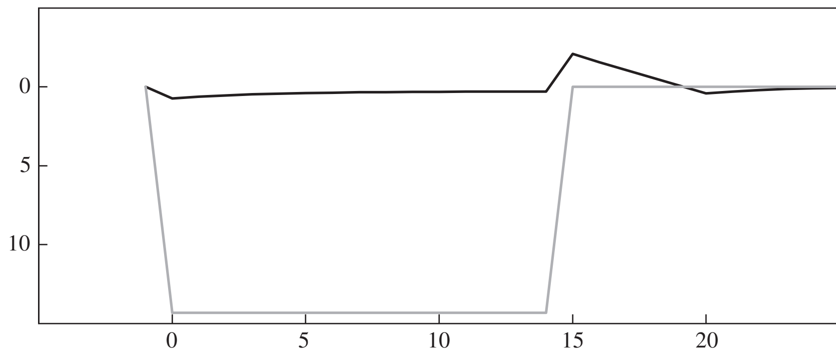



Grey line: optimal MP under discretion. Black line: optimal MP under commitment.

Calibration: $\beta = 0.99$, $\sigma = 2$, $\kappa = 0.02$, and $q = 0.9$. Source: Eggertsson and Woodford (2003).

# Output-gap response under optimal MP

Response of $\widetilde{y}_t$ to a fall in $r_t^n$ below zero for a period of fifteen quarters




Grey line: optimal MP under discretion. Black line: optimal MP under commitment.

Calibration: $\beta = 0.99$, $\sigma = 2$, $\kappa = 0.02$, and $q = 0.9$. Source: Eggertsson and Woodford (2003).

# Discretion vs. commitment

- The optimal MP under **discretion**, which consists in maintaining $i_t$ at zero only as long as $r_t^n = -s$, does not prevent a strong deflation and a deep recession during that time.

- The optimal MP under **commitment**, which consists in committing to maintaining $i_t$ at zero even after $r_t^n$ has come back to $r$, prevents a strong deflation and a deep recession, by
    - decreasing the current long-term nominal interest rate,
    - increasing current expectations of the future inflation rate,

  both of which decrease the current long-term real interest rate.

- Since the latter MP differs from the former, it is **time inconsistent**: while it is ex ante optimal, as long as the shock lasts, it is no longer optimal ex post, when the shock ends, since it is then inflationary.

# The role of forward guidance I

- When the current short-term nominal interest rate is close or equal to zero, MP can be further loosened by a (supposedly credible) **forward guidance** decreasing expected future short-term nominal interest rates.

- In Bernanke's (2002) words: "*So what then might the Fed do if its target interest rate, the overnight federal funds rate, fell to zero? One relatively straightforward extension of current procedures would be to try to stimulate spending by lowering rates further out along the Treasury term structure – that is, rates on government bonds of longer maturities. (...) One approach, similar to an action taken in the past couple of years by the Bank of Japan, would be for the Fed to commit to holding the overnight rate at zero for some specified period. Because long-term interest rates represent averages of current and expected future short-term rates, plus a term premium, a commitment to keep short-term rates at zero for some time – if it were credible – would induce a decline in longer-term rates.*"

# The role of forward guidance II

- In Bernanke's (2004c) words: "*my coauthors and I investigated alternative monetary policies that might be used when the short-term interest rate is close to zero. As the attending members of the Japan Society well know, Japan has been in that difficult situation for more than six years. Although effective communication by the central bank is always important, it becomes especially important when the rates are near zero. Indeed, when the proximity of the zero bound prevents further rate cuts to stimulate the economy, talking about future policy actions may be one of the few tools at the central bank's disposal by which to influence conditions in financial markets. (...)*

  *[T]o the extent that central bank talk provides useful guidance to markets about the likely future path of short-term interest rates, policymakers will exert greater influence over the longer-term interest rates that most matter for spending decisions.*"

# Role for a price-level-stabilization objective

- As noted in Chapter 2, when the ZLB is not binding and in the presence of cost-push shocks, a CB acting under **discretion** and aiming at stabilizing the price level (rather than the inflation rate) achieves exactly the same path as a CB acting under **commitment** and maximizing welfare.

- As noted by Eggertsson and Woodford (2003), when the ZLB is binding and in the absence of cost-push shocks, a CB acting under **discretion** and aiming at stabilizing the price level achieves a path close to the path achieved by a CB acting under **commitment** and maximizing welfare.

- Such a price-level-stabilization objective may, however, not be **credible** because of the time inconsistency of the associated MP (which offsets past deviations of inflation from its mean by current deviations of the opposite sign).

# In Bernanke's (2003b) words I

- In Bernanke's (2003b) words:

  "*As you may know, I have advocated explicit inflation targets, or at least a quantitative definition of price stability, for other leading central banks, including the Federal Reserve. (...) For Japan, given the recent history of costly deflation, however, an inflation target may not go far enough. A better strategy for Japanese monetary policy might be a publicly announced, gradually rising price-level target.*

  *What I have in mind is that the Bank of Japan would announce its intention to restore the price level (as measured by some standard index of prices, such as the consumer price index excluding fresh food) to the value it would have reached if, instead of the deflation of the past five years, a moderate inflation of, say, 1 percent per year had occurred. (...)*

# In Bernanke's (2003b) words II

*Because deflation implies falling prices while the target price-level rises, the failure to end deflation in a given year has the effect of increasing what I have called the price-level gap (...). The price-level gap is the difference between the actual price level and the price level that would have obtained if deflation had been avoided and the price stability objective achieved in the first place.*

*A successful effort to eliminate the price-level gap would proceed, roughly, in two stages. During the first stage, the inflation rate would exceed the long-term desired inflation rate, as the price-level gap was eliminated and the effects of previous deflation undone. Call this the reflationary phase of policy. Second, once the price-level target was reached, or nearly so, the objective for policy would become a conventional inflation target or a price-level target that increases over time at the average desired rate of inflation."*

# The Fed's average-inflation-stabilization objective I

- Most CBs have been assigned a non-specified "price-stability objective", so that they could decide themselves to specify it as a **price-level-stabilization objective** (i.e., an institutional delegation of MP is not needed).

- On August 27$^{\text{th}}$, 2020, the Fed announced, in a statement, the adoption of an average-inflation-stabilization objective, which is close in spirit to a price-level-stabilization objective:

  "*The Committee judges that longer-term inflation expectations that are well anchored at 2 percent foster price stability and moderate long-term interest rates and enhance the Committee's ability to promote maximum employment in the face of significant economic disturbances. In order to anchor longer-term inflation expectations at this level, the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time.*"

# The Fed's average-inflation-stabilization objective II

- As the Fed explained in an accompanying document, its motivation for adopting an average-inflation-stabilization objective had to do with the ZLB constraint and private agents' expectations of future inflation (in a way that is closely related to the rationale for forward-guidance policy at the ZLB):

  "*One important change is that the general level of interest rates has fallen, both here in the United States and around the world. This decline has profound implications for monetary policy. With interest rates generally running closer to their effective lower bound even in good times, the FOMC has less room to cut the policy interest rate when needed to support the economy. It also means that the federal funds rate is likely to be constrained by the effective lower bound more frequently than in the past. (...)*

# The Fed's average-inflation-stabilization objective III

*The Federal Reserve's longer-run inflation objective remains 2 percent. The revised Statement on Longer-Run Goals and Monetary Policy Strategy reflects the view that this objective can best be met by seeking to achieve inflation that averages 2 percent over time. If inflation runs below 2 percent following economic downturns but never moves above 2 percent even when the economy is strong, then over time inflation will average less than 2 percent. Inflation averaging less than 2 percent over time can lead to an unwelcome fall in longer-term inflation expectations, which in turn can pull actual inflation lower, resulting in an adverse cycle of lower inflation and inflation expectations. With lower expected inflation, the nominal level of interest rates will be lower too, leaving less room for the FOMC to cut interest rates when needed to support the economy in a downturn. By seeking inflation that averages 2 percent over time this will help ensure longer-run inflation expectations do not drift down and remain well anchored at 2 percent. For these reasons, following periods when inflation has been running below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."*

# Illustration No. 1: Japan, 1999-2003

- The Bank of Japan announced in April 1999 that it would maintain the short-term nominal interest rate at zero "until deflationary concerns are dispelled."

- The goal was to stimulate the economy through a decrease in the long-term nominal interest rate (Bernanke, 2004c), and it seems to have been achieved (Bernanke, Reinhart and Sack, 2004).

- The Bank of Japan (Fukui, 2003) explicitly contemplated two options for the date of the first interest-rate hike:
    1. when deflation ends (as the optimal monetary policy under discretion),
    2. after deflation has ended (as the optimal monetary policy under com.).

- It decided to publicly commit, on October 10, 2003, to maintaining the short-term nominal interest rate at zero at least until the inflation rate is positive during several months.

# Illustration No. 2: US, 2003-2004 I

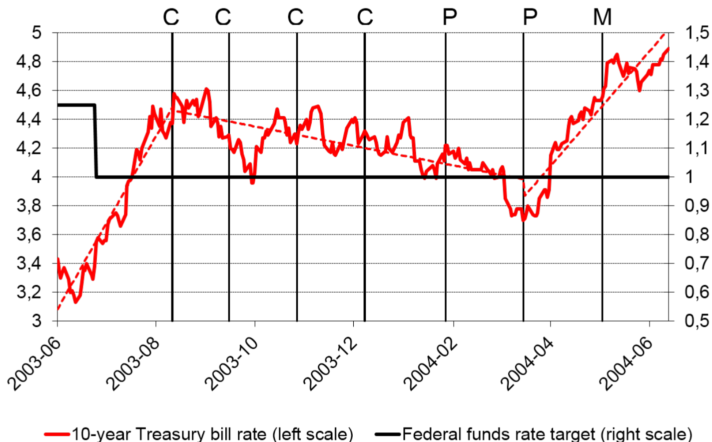
- The Fed announced, in statements published at the end of the meetings of the Federal Open Market Committee (FOMC) from August to December 2003, that the accommodative monetary-policy stance could be maintained during a "considerable period."

- The goal of these announcements was to stimulate the economy by a decrease in the long-term nominal interest rate (Bernanke, 2004c).

- These announcements apparently stopped and even partially reversed the more than 100-bp rise in the long-term nominal interest rate observed from end June to early August 2003, which was thwarting the Fed's efforts to avoid deflation.

- Bernanke, Reinhart and Sack (2004) show that these announcements do indeed seem to have had the desired effect (Bernanke, 2004c).

# Illustration No. 2: US, 2003-2004 II




*"the Committee believes that..."* (C) *"...policy accommodation can be maintained for a considerable period"* (P) *"...it can be patient in removing its policy accommodation."* (M) *"...policy accommodation can be removed at a pace that is likely to be measured"*.

# Illustration No. 3: US, 2008-2016 I

Excerpts from the statements published at the end of FOMC meetings (my emphasis in bold):

- On December 16, 2008: "*the Committee anticipates that weak economic conditions are likely to warrant exceptionally low levels of the federal funds rate* ***for some time****.*"
- On January 28, 2009: "*the Committee continues to anticipate that economic conditions are likely to warrant exceptionally low levels of the federal funds rate* ***for some time****.*"
- From March 18, 2009, to April 29, 2010: "*the Committee (...) anticipates that economic conditions are likely to warrant exceptionally low levels of the federal funds rate* ***for an extended period****.*"
- From June 24, 2010, to June 22, 2011: "*the Committee (...) continues to anticipate that economic conditions (...) are likely to warrant exceptionally low levels for the federal funds rate* ***for an extended period****.*"

# Illustration No. 3: US, 2008-2016 II

- From August 9, 2011, to December 13, 2011: "*the Committee (...) currently anticipates that economic conditions (...) are likely to warrant exceptionally low levels for the federal funds rate* ***at least through mid-2013***."

- From January 25, 2012, to August 1, 2012: "*the Committee (...) currently anticipates that economic conditions (...) are likely to warrant exceptionally low levels for the federal funds rate* ***at least through late 2014***."

- From September 13, 2012, to October 24, 2012: "*the Committee expects that a highly accommodative stance of monetary policy will remain appropriate* ***for a considerable time after*** *the economic recovery strengthens. In particular, the Committee (...) currently anticipates that exceptionally low levels for the federal funds rate are likely to be warranted* ***at least through mid-2015***."

# Illustration No. 3: US, 2008-2016 III

- On December 12, 2012: "*the Committee expects that a highly accommodative stance of monetary policy will remain appropriate **for a considerable time after** the asset purchase program ends and the economic recovery strengthens. In particular, the Committee (...) 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 percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. The Committee views these thresholds as consistent with its earlier date-based guidance.*"

# Illustration No. 3: US, 2008-2016 IV

- From January 30, 2013, to June 29, 2013: "*the Committee expects that a highly accommodative stance of monetary policy will remain appropriate* ***for a considerable time after*** *the asset purchase program ends and the economic recovery strengthens. In particular, the Committee (...) 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 percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored.*"

- From July 31, 2013, to October 30, 2013: same wording as above, except that "*the Committee expects that a highly accommodative stance*" is replaced by "*the Committee today reaffirmed its view that a highly accommodative stance.*"

# Illustration No. 3: US, 2008-2016 V

- On December 18, 2013: "*the Committee today reaffirmed its view that a highly accommodative stance of monetary policy will remain appropriate* ***for a considerable time after*** *the asset purchase program ends and the economic recovery strengthens. The Committee also reaffirmed its expectation that the current exceptionally low target range for the federal funds rate of 0 to 1/4 percent will be appropriate* ***at least as long as*** *the unemployment rate remains above 6-1/2 percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. (...) The Committee now anticipates, based on its assessment of these factors, that it likely will be appropriate to maintain the current target range for the federal funds rate* ***well past the time that*** *the unemployment rate declines below 6-1/2 percent, especially if projected inflation continues to run below the Committee's 2 percent longer-run goal.*"
- On January 29, 2014: same wording as above, except that "*now anticipates*" is replaced by "*continues to anticipate.*"

# Illustration No. 3: US, 2008-2016 VI

- On March 19, 2014: "*In determining how long to maintain the current 0 to 1/4 percent target range for the federal funds rate, the Committee will assess progress – both realized and expected – toward its objectives of maximum employment and 2 percent inflation. (...) The Committee continues to anticipate, based on its assessment of these factors, that it likely will be appropriate to maintain the current target range for the federal funds rate* ***for a considerable time after*** *the asset purchase program ends, especially if projected inflation continues to run below the Committee's 2 percent longer-run goal, and provided that longer-term inflation expectations remain well anchored. (...) The Committee currently anticipates that,* ***even after*** *employment and inflation are near mandate-consistent levels, economic conditions may,* ***for some time****, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run. With the unemployment rate nearing 6-1/2 percent, the Committee has updated its forward guidance. The change in the Committee's guidance does not indicate any change in the Committee's policy intentions as set forth in its recent statements.*"

# Illustration No. 3: US, 2008-2016 VII

- From April 30, 2014, to September 17, 2014: "*In determining how long to maintain the current 0 to 1/4 percent target range for the federal funds rate, the Committee will assess progress – both realized and expected – toward its objectives of maximum employment and 2 percent inflation. (...) The Committee continues to anticipate, based on its assessment of these factors, that it likely will be appropriate to maintain the current target range for the federal funds rate* ***for a considerable time after*** *the asset purchase program ends, especially if projected inflation continues to run below the Committee's 2 percent longer-run goal, and provided that longer-term inflation expectations remain well anchored. (...) The Committee currently anticipates that,* ***even after*** *employment and inflation are near mandate-consistent levels, economic conditions may,* ***for some time****, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.*"

# Illustration No. 3: US, 2008-2016 VIII

- On October 29, 2014: "*In determining how long to maintain this target range, the Committee will assess progress – both realized and expected – toward its objectives of maximum employment and 2 percent inflation. (...) The Committee anticipates, based on its current assessment, that it likely will be appropriate to maintain the 0 to 1/4 percent target range for the federal funds rate* ***for a considerable time following*** *the end of its asset purchase program this month, especially if projected inflation continues to run below the Committee's 2 percent longer-run goal, and provided that longer-term inflation expectations remain well anchored. However, if incoming information indicates faster progress toward the Committee's employment and inflation objectives than the Committee now expects, then increases in the target range for the federal funds rate are likely to occur sooner than currently anticipated. Conversely, if progress proves slower than expected, then increases in the target range are likely to occur later than currently anticipated. (...) The Committee currently anticipates that,* ***even after*** *employment and inflation are near mandate-consistent levels, economic conditions may,* ***for some time****, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.*"

# Illustration No. 3: US, 2008-2016 IX

- On December 17, 2014: "*In determining how long to maintain this target range, the Committee will assess progress – both realized and expected – toward its objectives of maximum employment and 2 percent inflation. (...) Based on its current assessment, the Committee judges that it can be* ***patient*** *in beginning to normalize the stance of monetary policy. The Committee sees this guidance as consistent with its previous statement that it likely will be appropriate to maintain the 0 to 1/4 percent target range for the federal funds rate* ***for a considerable time following*** *the end of its asset purchase program in October, especially if projected inflation continues to run below the Committee's 2 percent longer-run goal, and provided that longer-term inflation expectations remain well anchored. However, if incoming information indicates faster progress toward the Committee's employment and inflation objectives than the Committee now expects, then increases in the target range for the federal funds rate are likely to occur sooner than currently anticipated. Conversely, if progress proves slower than expected, then increases in the target range are likely to occur later than currently anticipated. (...) The Committee currently anticipates that, ...*

# Illustration No. 3: US, 2008-2016 X

*...**even after** employment and inflation are near mandate-consistent levels, economic conditions may, **for some time**, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.*"

- On January 28, 2015: "*In determining how long to maintain this target range, the Committee will assess progress – both realized and expected – toward its objectives of maximum employment and 2 percent inflation. (...) Based on its current assessment, the Committee judges that it can be **patient** in beginning to normalize the stance of monetary policy. However, if incoming information indicates faster progress toward the Committee's employment and inflation objectives than the Committee now expects, then increases in the target range for the federal funds rate are likely to occur sooner than currently anticipated. Conversely, if progress proves slower than expected, then increases in the target range are likely to occur later than currently anticipated. (...) The Committee currently anticipates that, **even after** employment and inflation are near mandate-consistent levels, economic conditions may, **for some time**, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.*"

# Illustration No. 3: US, 2008-2016 XI

- On March 18, 2015: "*In determining how long to maintain this target range, the Committee will assess progress – both realized and expected – toward its objectives of maximum employment and 2 percent inflation. (...) Consistent with its previous statement, the Committee judges that an increase in the target range for the federal funds rate remains* ***unlikely at the April FOMC meeting****. The Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term. This change in the forward guidance does not indicate that the Committee has decided on the timing of the initial increase in the target range. (...) The Committee currently anticipates that,* ***even after*** *employment and inflation are near mandate-consistent levels, economic conditions may,* ***for some time****, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.*"

# Illustration No. 3: US, 2008-2016 XII

- From April 29, 2015, to June 17, 2015: "*In determining how long to maintain this target range, the Committee will assess progress – both realized and expected – toward its objectives of maximum employment and 2 percent inflation. (...) The Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term. (...) The Committee currently anticipates that, **even after** employment and inflation are near mandate-consistent levels, economic conditions may, **for some time**, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.*"

- From July 29, 2015, to September 17, 2015: same wording as above, except that "*when it has seen further improvement*" is replaced by "*when it has seen some further improvement.*"

# Illustration No. 3: US, 2008-2016 XIII

- On October 28, 2015: "*In determining whether it will be appropriate to raise the target range at its next meeting, the Committee will assess progress – both realized and expected – toward its objectives of maximum employment and 2 percent inflation. (...) The Committee anticipates that it will be appropriate to raise the target range for the federal funds rate when it has seen some further improvement in the labor market and is reasonably confident that inflation will move back to its 2 percent objective over the medium term. (...) The Committee currently anticipates that,* ***even after*** *employment and inflation are near mandate-consistent levels, economic conditions may,* ***for some time****, warrant keeping the target federal funds rate below levels the Committee views as normal in the longer run.*"

# Illustration No. 3: US, 2008-2016 XIV

- From December 16, 2015, to December 14, 2016: "*In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation. (...) The Committee expects that economic conditions will evolve in a manner that will warrant* ***only gradual increases*** *in the federal funds rate; the federal funds rate is likely to remain,* ***for some time****, below levels that are expected to prevail in the longer run. However, the actual path of the federal funds rate will depend on the economic outlook as informed by incoming data.*"

# Illustration No. 3: US, 2008-2016 XV

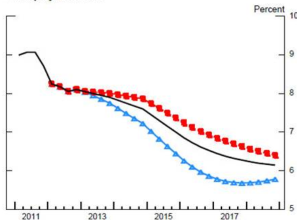
- In Yellen's (2012) words:

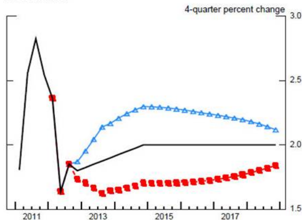
  "*The solid black line in the bottom panel of the figure shows the median of dealers' expectations for the path of the federal funds rate through the end of 2015. The dealers assumed it would remain near zero through the first half of 2015, consistent with the guidance the Committee subsequently provided. Beyond 2015, the federal funds rate is assumed to gradually rise to 4 percent, the long-run value expected by most dealers as well as most FOMC participants. I have assumed in the baseline that this process is largely completed within four years.*

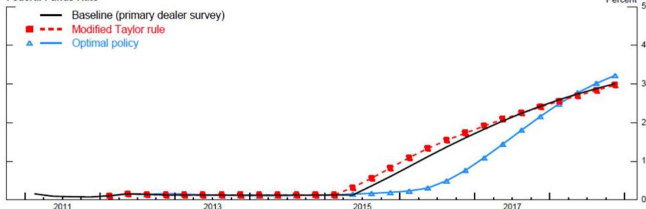
  *The question I now want to address is whether this illustrative baseline path for the federal funds rate is one that reflects a balanced approach to attaining our longer-run objectives (...). To answer this question I need to rely, as I noted, on a specific macroeconomic model, and, for this purpose, ...*

# Illustration No. 3: US, 2008-2016 XVI

Three Policy Paths: An Illustrative Exercise




Source: Federal Reserve Bank of New York, Survey of Primary Dealers, September 2012.
(The charts have been revised since their original release.)

# Illustration No. 3: US, 2008-2016 XVII

*...I will employ the FRB/US model, one of the economic models commonly used at the Board. The model lets us analyze every possible policy path to see which one yields the best feasible outcome for the paths of unemployment and inflation. Although the exact numerical results of the exercises I am about to report depend on the specific model, the qualitative points that I'll highlight are fairly general.*

*To derive a path for the federal funds rate consistent with the Committee's enunciated longer-run goals and balanced approach, I assume that monetary policy aims to minimize the deviations of inflation from 2 percent and the deviations of the unemployment rate from 6 percent, with equal weight on both objectives. In computing the best, or 'optimal policy,' path for the federal funds rate to achieve these objectives, I will assume that the public fully anticipates that the FOMC will follow this optimal plan and is able to assess its effect on the economy.*

# Illustration No. 3: US, 2008-2016 XVIII

*The blue lines with triangles labeled 'Optimal policy' show the resulting paths. The optimal policy to implement this 'balanced approach' to minimizing deviations from the inflation and unemployment goals involves keeping the federal funds rate close to zero until early 2016, about two quarters longer than in the illustrative baseline, and keeping the federal funds rate below the baseline path through 2018. This highly accommodative policy path generates a faster reduction in unemployment than in the baseline, while inflation slightly overshoots the Committee's 2 percent objective for several years.*

*This path illustrates one of the key features of optimal policy under a balanced approach to the dual mandate. Provided that long-term inflation expectations are firmly anchored, the federal funds rate is set to balance the benefits from a faster reduction of the unemployment rate against the losses from a temporary and modest increase of inflation above 2 percent. (...)*

# Illustration No. 3: US, 2008-2016 XIX

*The red lines with squares labeled 'Modified Taylor rule' show the economic outcomes that would be expected if the federal funds rate were set according to the prescriptions of a rule that is similar to the original Taylor rule, with the only difference being that it responds equally to deviations of unemployment and inflation from their respective longer-run values.*

*The figure shows that this rule would raise the federal funds rate substantially earlier than the optimal path and thereby leads to more protracted deviations of the unemployment rate above its longer-run normal level without any measurable gains in keeping inflation closer to the 2 percent target. In contrast, the optimal policy results in better economic outcomes. In effect, it compensates for the period of economic weakness induced by both the zero lower bound and the unusual persistence and severity of the headwinds now buffeting the economy by holding the federal funds rate lower for longer than the modified Taylor rule, thereby maintaining greater accommodation as the economic recovery takes hold. (...)*

# Illustration No. 3: US, 2008-2016 XX

*The challenge facing the FOMC now is to devise ways to communicate its policy intentions during a period in which policy will most likely be constrained by the zero bound on short-term rates (...). I think the existing FOMC postmeeting statement already goes some way in this direction. (...)*

*[I]t offers a date—mid-2015—as the earliest time at which the Committee currently anticipates that liftoff might be warranted. As the simulations illustrate, this date is later than the modified Taylor rule would predict and closer to the predictions of the optimal policy simulation. This later liftoff date is consistent with the Committee's statement that 'a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens.' Moreover, the simulations also suggest that, once liftoff from the zero lower bound occurs, it would be optimal for the federal funds rate to remain for some time below the prescriptions from a rule, such as the modified Taylor rule, that might in the past have provided a good guide to the Committee's action."*

# Illustration No. 3: US, 2008-2016 XXI

- In Yellen's (2013) words:

  "*Last December, the Committee replaced its calendar guidance for the federal funds rate with quantitative measures of economic conditions that would warrant continuing that rate at its current very low level. (...) I consider these thresholds for possible action a major improvement in forward guidance. They provide much more information than before about the conditions that are likely to prevail when the FOMC decides to raise the federal funds rate. As for the date at which tightening of monetary policy is likely to occur, market participants, armed with this new information about the Committee's 'reaction function,' can form their own judgment and alter their expectations on timing as new information accrues over time.*

# Illustration No. 3: US, 2008-2016 XXII

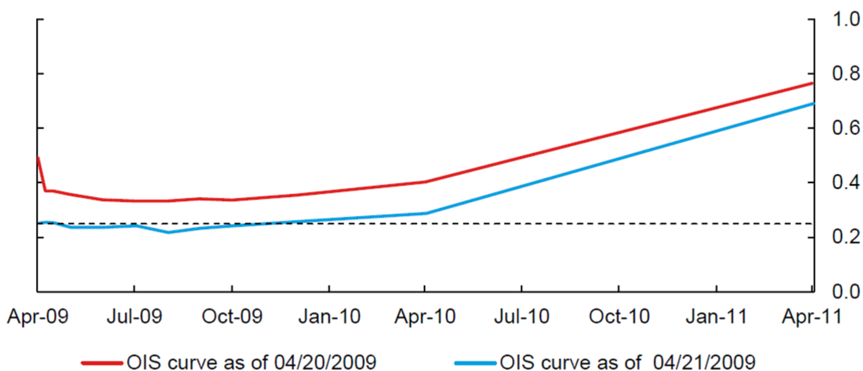
*These thresholds will, as a consequence, allow private-sector expectations of the federal funds rate to fulfill an important 'automatic stabilizer' function for the economy. If the recovery is stronger than expected, the public should anticipate that one or both of the threshold values will be crossed sooner and, hence, that the federal funds rate could be raised earlier. Conversely, if the outlook for the economy unexpectedly worsens, the public should expect a later 'liftoff' in rates—an expectation that would reduce longer-term interest rates and thereby provide more-accommodative financial conditions.*"

# Illustration No. 4: Canada, 2009 I

- In Carney's (2012) words:

  "*The Bank of Canada used extraordinary forward guidance in April 2009, when the policy interest rate was at its lowest possible level and additional stimulus was needed. At the time, we committed to holding the policy rate at that level through the second quarter of 2010, conditional on the outlook for inflation. In effect, we substituted duration and greater certainty regarding the interest rate outlook for the negative interest rate setting that would have been warranted but could not be achieved. The Bank's conditional commitment succeeded in changing market expectations of the future path of interest rates, providing the desired stimulus and thereby underpinning a rebound in growth and inflation in Canada (Chart 3). When the inflation outlook – the explicit condition – changed, the path of interest rates changed accordingly.*

# Illustration No. 4: Canada, 2009 II



# Illustration No. 4: Canada, 2009 III

*(...) [T]o achieve a better path for the economy over time, a central bank may need to commit credibly to maintaining highly accommodative policy even after the economy and, potentially, inflation picks up. Market participants may doubt the willingness of an inflation-targeting central bank to respect this commitment if inflation goes temporarily above target. These doubts reduce the effective stimulus of the commitment and delay the recovery.*

*To 'tie its hands,' a central bank could publicly announce precise numerical thresholds for inflation and unemployment that must be met before reducing stimulus. This could reinforce the central bank's commitment to stimulative policy in the future and thus enhance the stimulative impact of its policies in the present, helping the economy escape from the liquidity trap."*

# Illustration No. 5: Euro area, 2013-2014 I

Excerpts from the statements published at the end of Governing-Council meetings:

- On July 4, 2013: "*The Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time.*"
- From August 1, 2013, to October 2, 2013: same wording as on July 4, except that "*expects*" is replaced by "*confirms that it expects*".
- On November 7, 2013: same wording as on July 4, except that "*expects*" is replaced by "*reviewed the forward guidance provided in July and confirmed that it continues to expect*".
- On December 5, 2013: same wording as on July 4, except that "*expects*" is replaced by "*confirmed its forward guidance that it continues to expect*".

# Illustration No. 5: Euro area, 2013-2014 II

- On January 9, 2014: "*we firmly reiterate our forward guidance that we continue to expect the key ECB interest rates to remain at present or lower levels for an extended period of time.*"
- From February 6, 2014, to March 6, 2014: "*We firmly reiterate our forward guidance. We continue to expect the key ECB interest rates to remain at present or lower levels for an extended period of time.*"
- From April 3, 2014, to May 8, 2014: "*we firmly reiterate that we continue to expect the key ECB interest rates to remain at present or lower levels for an extended period of time.*"
- From June 5, 2014, to August 7, 2014: "*Concerning our forward guidance, the key ECB interest rates will remain at present levels for an extended period of time in view of the current outlook for inflation.*"

# Illustration No. 6: Euro area, 2016-2024 I

Excerpts from the statements published at the end of Governing-Council meetings (my emphasis in bold):

- From July 21, 2016, to April 27, 2017: "*The Governing Council continues to expect the key ECB interest rates to* ***remain at present or lower levels for an extended period of time****, and well past the horizon of the net asset purchases.*"
- From June 8, 2017, to April 26, 2018: "*The Governing Council expects [or continues to expect] the key ECB interest rates to* ***remain at their present levels for an extended period of time****, and well past the horizon of the net asset purchases.*"
- On June 14, 2018: "*The Governing Council expects the key ECB interest rates to* ***remain at their present levels at least through the summer of 2019*** *and in any case for as long as necessary to ensure that the evolution of inflation remains aligned with the current expectations of a sustained adjustment path.*"

# Illustration No. 6: Euro area, 2016-2024 II

- From July 26, 2018, to January 24, 2019: "*The Governing Council expects the key ECB interest rates to* ***remain at their present levels at least through the summer of 2019****, and in any case for as long as necessary to ensure the continued sustained convergence of inflation to levels that are below, but close to, 2% over the medium term.*"

- From March 7, 2019, to April 10, 2019: "*The Governing Council [now] expects the key ECB interest rates to* ***remain at their present levels at least through the end of 2019****, and in any case for as long as necessary to ensure the continued sustained convergence of inflation to levels that are below, but close to, 2% over the medium term.*"

- On June 6, 2019: "*The Governing Council now expects the key ECB interest rates to* ***remain at their present levels at least through the first half of 2020****, and in any case for as long as necessary to ensure the continued sustained convergence of inflation to levels that are below, but close to, 2% over the medium term.*"

# Illustration No. 6: Euro area, 2016-2024 III

- On July 25, 2019: "*The Governing Council expects the key ECB interest rates to* ***remain at their present or lower levels at least through the first half of 2020****, and in any case for as long as necessary to ensure the continued sustained convergence of inflation to its aim over the medium term.*"

- From September 12, 2019, to June 10, 2021: "*The Governing Council [now] expects the key ECB interest rates to* ***remain at their present or lower levels until it has seen the inflation outlook robustly converge to a level sufficiently close to, but below, 2% within its projection horizon, and such convergence has been consistently reflected in underlying inflation dynamics****.*"

# Illustration No. 6: Euro area, 2016-2024 IV

- On July 22, 2021: "*The key ECB interest rates have been close to their lower bound for some time and the medium-term outlook for inflation is still well below the Governing Council's target. In these conditions, the Governing Council today revised its forward guidance on interest rates. It did so to underline its commitment to maintain a persistently accommodative monetary policy stance to meet its inflation target.*

  *In support of its symmetric two per cent inflation target and in line with its monetary policy strategy, the Governing Council expects the key ECB interest rates to* ***remain at their present or lower levels until it sees inflation reaching two per cent well ahead of the end of its projection horizon and durably for the rest of the projection horizon, and it judges that realised progress in underlying inflation is sufficiently advanced to be consistent with inflation stabilising at 2% over the medium term****. This may also imply a* ***transitory period in which inflation is moderately above target****.*"

# Illustration No. 6: Euro area, 2016-2024 V

- From September 9, 2021, to February 3, 2022: "*In support of its symmetric 2% inflation target and in line with its monetary policy strategy, the Governing Council expects the key ECB interest rates to* ***remain at their present or lower levels until it sees inflation reaching 2% well ahead of the end of its projection horizon and durably for the rest of the projection horizon, and it judges that realised progress in underlying inflation is sufficiently advanced to be consistent with inflation stabilising at 2% over the medium term****. This may also imply a* ***transitory period in which inflation is moderately above target****.*"

- From March 10, 2022, to April 14, 2022: "*the Governing Council expects the key ECB interest rates to* ***remain at their present levels until it sees inflation reaching 2% well ahead of the end of its projection horizon and durably for the rest of the projection horizon, and it judges that realised progress in underlying inflation is sufficiently advanced to be consistent with inflation stabilising at 2% over the medium term****.*"

# Illustration No. 6: Euro area, 2016-2024 VI

- On June 9, 2022: "*The Governing Council undertook a careful review of the conditions which, according to its forward guidance, should be satisfied before it starts raising the key ECB interest rates. As a result of this assessment, the Governing Council concluded that* ***those conditions have been satisfied****. Accordingly, and in line with the Governing Council's policy sequencing, the Governing Council intends to* ***raise the key ECB interest rates by 25 basis points at its July monetary policy meeting****. (...) Looking further ahead, the Governing Council expects to* ***raise the key ECB interest rates again in September****. The calibration of this rate increase will depend on the updated medium-term inflation outlook. If the medium-term inflation outlook persists or deteriorates, a larger increment will be appropriate at the September meeting. Beyond September, based on its current assessment, the Governing Council anticipates that* ***a gradual but sustained path of further increases in interest rates will be appropriate****.*"

# Illustration No. 6: Euro area, 2016-2024 VII

- On July 21, 2022: "*The Governing Council decided to raise the three key ECB interest rates by 50 basis points. (...) At the Governing Council's upcoming meetings,* ***further normalisation of interest rates will be appropriate****. The frontloading today of the exit from negative interest rates allows the Governing Council to make a transition to a meeting-by-meeting approach to interest rate decisions. The Governing Council's future policy rate path will continue to be data-dependent and will help to deliver on its 2% inflation target over the medium term.*"

- On September 8, 2022: "*The Governing Council today decided to raise the three key ECB interest rates by 75 basis points. (...) Based on its current assessment,* ***over the next several meetings*** *the Governing Council expects to* ***raise interest rates further*** *to dampen demand and guard against the risk of a persistent upward shift in inflation expectations. (...) The Governing Council's future policy rate decisions will continue to be data-dependent and follow a meeting-by-meeting approach.*"

# Illustration No. 6: Euro area, 2016-2024 VIII

- On October 27, 2022: "*The Governing Council today decided to raise the three key ECB interest rates by 75 basis points. (...) The Governing Council took today's decision, and* ***expects to raise interest rates further****, to ensure the timely return of inflation to its 2% medium-term inflation target. The Governing Council will base the future policy rate path on the evolving outlook for inflation and the economy, following its meeting-by-meeting approach.*"

- On December 15, 2022: "*The Governing Council today decided to raise the three key ECB interest rates by 50 basis points and, based on the substantial upward revision to the inflation outlook,* ***expects to raise them further****. In particular, the Governing Council* ***judges that interest rates will still have to rise significantly at a steady pace*** *to reach levels that are sufficiently restrictive to ensure a timely return of inflation to the 2% medium-term target. (...) The Governing Council decided to raise interest rates today, and* ***expects to raise them significantly further****, because inflation remains far too high and is projected to stay above the target for too long.*"

# Illustration No. 6: Euro area, 2016-2024 IX

- On February 2, 2023: "*The Governing Council* ***will stay the course in raising interest rates significantly at a steady pace and in keeping them at levels that are sufficiently restrictive*** *to ensure a timely return of inflation to its 2% medium-term target. Accordingly, the Governing Council today decided to raise the three key ECB interest rates by 50 basis points and it* ***expects to raise them further****. In view of the underlying inflation pressures, the Governing Council* ***intends to raise interest rates by another 50 basis points at its next monetary policy meeting in March*** *and it will then evaluate the subsequent path of its monetary policy.*"

- From May 4, 2023, to June 15, 2023: "*[T]he Governing Council (...) today decided to raise the three key ECB interest rates by 25 basis points. (...) The Governing Council's future decisions will ensure that the (...) rates will be brought to levels sufficiently restrictive to achieve a timely return of inflation to the 2% medium-term target and* ***will be kept at those levels for as long as necessary***."

# Illustration No. 6: Euro area, 2016-2024 X

- From May 4, 2023, to June 15, 2023: "*[T]he Governing Council (...) today decided to raise the three key ECB interest rates by 25 basis points. (...) The Governing Council's future decisions will ensure that the (...) rates will be brought to levels sufficiently restrictive to achieve a timely return of inflation to the 2% medium-term target and* ***will be kept at those levels for as long as necessary****.*"

- On July 27, 2023: "*The Governing Council (...) today decided to raise the three key ECB interest rates by 25 basis points. (...) The Governing Council's future decisions will ensure that the key ECB interest rates will be set at sufficiently restrictive levels* ***for as long as necessary*** *to achieve a timely return of inflation to the 2% medium-term target.*"

# Illustration No. 6: Euro area, 2016-2024 XI

- On September 14, 2023: "*[T]he Governing Council today decided to raise the three key ECB interest rates by 25 basis points. (...) Based on its current assessment, the Governing Council considers that the key ECB interest rates have reached levels that,* ***maintained for a sufficiently long duration****, will make a substantial contribution to the timely return of inflation to the target. The Governing Council's future decisions will ensure that the key ECB interest rates will be set at sufficiently restrictive levels* ***for as long as necessary****.*"

- From October 26, 2023, to March 7, 2024: "*The Governing Council today decided to keep the three key ECB interest rates unchanged. (...) Based on its current assessment, the Governing Council considers that the key ECB interest rates are at levels that,* ***maintained for a sufficiently long duration****, will make a substantial contribution to this goal. The Governing Council's future decisions will ensure that its policy rates will be set at sufficiently restrictive levels* ***for as long as necessary****.*"

# Illustration No. 6: Euro area, 2016-2024 XII

- On April 11, 2024: "*The Governing Council today decided to keep the three key ECB interest rates unchanged. (...) The Governing Council's future decisions will ensure that its policy rates will stay sufficiently restrictive* ***for as long as necessary****. (...) [T]he Governing Council will continue to follow a data-dependent and meeting-by-meeting approach to determining the appropriate level and duration of restriction, and it is* ***not pre-committing to a particular rate path****.*"

# Illustration No. 6: Euro area, 2016-2024 XIII

- From June 6, 2024, to October 17, 2024: "*The Governing Council today decided to [...]. (...) The Governing Council (...) will keep policy rates sufficiently restrictive* ***for as long as necessary*** *to achieve this aim. The Governing Council will continue to follow a data-dependent and meeting-by-meeting approach to determining the appropriate level and duration of restriction. (...) The Governing Council is* ***not pre-committing to a particular rate path***."

June 6, 2024: *[...]* = *lower the three key ECB interest rates by 25 basis points*.

July 18, 2024: *[...]* = *keep the three key ECB interest rates unchanged*.

September 12, 2024: *[...]* = *lower the deposit facility rate (...) by 25 basis points*.

October 17, 2024: *[...]* = *lower the three key ECB interest rates by 25 basis points*.

# Illustration No. 7: US, 2020-2024 I

Excerpts from the statements published at the end of FOMC meetings (my emphasis in bold):

- From March 15, 2020, to July 29, 2020: "*the Committee decided to lower the target range for the federal funds rate to 0 to 1/4 percent. The Committee expects to maintain this target range until it is confident that the economy has weathered recent events and is on track to achieve its maximum employment and price stability goals.*"

# Illustration No. 7: US, 2020-2024 II

- From September 16, 2020, to April 28, 2021: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. With inflation **running** persistently below this longer-run goal, **the Committee will aim to achieve inflation moderately above 2 percent for some time** so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent. The Committee expects to maintain an accommodative stance of monetary policy **until these outcomes are achieved**. The Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and expects it will be appropriate to maintain this target range **until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time**.*"

# Illustration No. 7: US, 2020-2024 III

- From June 16, 2021, to November 3, 2021: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. With inflation* ***having run*** *persistently below this longer-run goal,* ***the Committee will aim to achieve inflation moderately above 2 percent for some time*** *so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent. The Committee expects to maintain an accommodative stance of monetary policy* ***until these outcomes are achieved****. The Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and expects it will be appropriate to maintain this target range* ***until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time***."

# Illustration No. 7: US, 2020-2024 IV

- On December 15, 2021: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. In support of these goals, the Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent. With inflation* ***having exceeded*** *2 percent for some time, the Committee expects it will be appropriate to maintain this target range* ***until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment****.*"

- On January 26, 2022: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. In support of these goals, the Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent. With inflation well above 2 percent and a strong labor market, the Committee expects it will* ***soon*** *be appropriate to raise the target range for the federal funds rate.*"

# Illustration No. 7: US, 2020-2024 V

- From March 16, 2022, to May 4, 2022: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. With appropriate firming in the stance of monetary policy, the Committee expects inflation to return to its 2 percent objective and the labor market to remain strong. In support of these goals, the Committee decided to raise the target range for the federal funds rate to [...] percent and anticipates that* ***ongoing increases in the target range will be appropriate****.*"

  March 16, 2022: *[...] = 1/4 to 1/2*

  May 4, 2022: *[...] = 3/4 to 1*

# Illustration No. 7: US, 2020-2024 VI

- From June 15, 2022, to September 21, 2022: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. In support of these goals, the Committee decided to raise the target range for the federal funds rate to [...] percent and anticipates that* ***ongoing increases in the target range will be appropriate****. (...) The Committee is strongly committed to returning inflation to its 2 percent objective.*"

  June 15, 2022: *[...] = 1-1/2 to 1-3/4*
  July 27, 2022: *[...] = 2-1/4 to 2-1/2*
  September 21, 2022: *[...] = 3 to 3-1/4*

# Illustration No. 7: US, 2020-2024 VII

- From November 2, 2022, to February 1, 2023: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. In support of these goals, the Committee decided to raise the target range for the federal funds rate to [...]. The Committee anticipates that* ***ongoing increases in the target range will be appropriate*** *in order to attain a stance of monetary policy that is sufficiently restrictive to return inflation to 2 percent over time.* ***In determining the [...] of future increases in the target range, the Committee will take into account the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments.*** *(...) The Committee is strongly committed to returning inflation to its 2 percent objective.* "

November 2, 2022: *[...] = 3-3/4 to 4 percent*; *[...] = pace*

December 14, 2022: *[...] = 4-1/4 to 4-1/2 percent*; *[...] = pace*

February 1, 2024: *[...] = 4-1/2 to 4-3/4 percent*; *[...] = extent*

# Illustration No. 7: US, 2020-2024 VIII

- On March 22, 2023: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. In support of these goals, the Committee decided to raise the target range for the federal funds rate to 4-3/4 to 5 percent. The Committee anticipates that* ***some additional policy firming may be appropriate*** *in order to attain a stance of monetary policy that is sufficiently restrictive to return inflation to 2 percent over time.* ***In determining the extent of future increases in the target range, the Committee will take into account the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments.*** *(...) The Committee is strongly committed to returning inflation to its 2 percent objective.* "

# Illustration No. 7: US, 2020-2024 IX

- On May 3, 2023: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. In support of these goals, the Committee decided to raise the target range for the federal funds rate to 5 to 5-1/4 percent. (...)* ***In determining the extent to which additional policy firming may be appropriate*** *to return inflation to 2 percent over time,* ***the Committee will take into account the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments.*** *(...) The Committee is strongly committed to returning inflation to its 2 percent objective.* "

# Illustration No. 7: US, 2020-2024 X

- From June 14, 2023, to December 13, 2023: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. In support of these goals, the Committee decided to [...] the target range for the federal funds rate [...]. (...)* ***In determining the extent of [...] policy firming that may be appropriate*** *to return inflation to 2 percent over time,* ***the Committee will take into account the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments.*** *(...) The Committee is strongly committed to returning inflation to its 2 percent objective.* "

June 14, 2023: *[...] = maintain*; *[...] = at 5 to 5-1/4 percent*; ***[...]*** *= additional.*

July 26, 2023: *[...] = raise*; *[...] = to 5-1/4 to 5-1/2 percent*; ***[...]*** *= additional.*

From September 20, 2023, to November 1, 2023: *[...] = maintain*; *[...] = at 5-1/4 to 5-1/2 percent*; ***[...]*** *= additional.*

December 13, 2023: *[...] = maintain*; *[...] = at 5-1/4 to 5-1/2 percent*; ***[...]*** *= any additional.*

# Illustration No. 7: US, 2020-2024 XI

- From January 31, 2024, to July 31, 2024: "*The Committee seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run. (...) In support of its goals, the Committee decided to maintain the target range for the federal funds rate at 5-1/4 to 5-1/2 percent. (...)* ***The Committee does not expect it will be appropriate to reduce the target range until it has gained greater confidence that inflation is moving sustainably toward 2 percent****.*"