## Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assessments of projected appropriate monetary policy, December 2018

Percent

| Variable | Median[1] | | | | | Central tendency[2] | | | | | Range[3] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2018 | 2019 | 2020 | 2021 | Longer run | 2018 | 2019 | 2020 | 2021 | Longer run | 2018 | 2019 | 2020 | 2021 | Longer run |
| Change in real GDP | 3.0 | 2.3 | 2.0 | 1.8 | 1.9 | 3.0 – 3.1 | 2.3 – 2.5 | 1.8 – 2.0 | 1.5 – 2.0 | 1.8 – 2.0 | 3.0 – 3.1 | 2.0 – 2.7 | 1.5 – 2.2 | 1.4 – 2.1 | 1.7 – 2.2 |
| September projection | 3.1 | 2.5 | 2.0 | 1.8 | 1.8 | 3.0 – 3.2 | 2.4 – 2.7 | 1.8 – 2.1 | 1.6 – 2.0 | 1.8 – 2.0 | 2.9 – 3.2 | 2.1 – 2.8 | 1.7 – 2.4 | 1.5 – 2.1 | 1.7 – 2.1 |
| Unemployment rate | 3.7 | 3.5 | 3.6 | 3.8 | 4.4 | 3.7 | 3.5 – 3.7 | 3.5 – 3.8 | 3.6 – 3.9 | 4.2 – 4.5 | 3.7 | 3.4 – 4.0 | 3.4 – 4.3 | 3.4 – 4.2 | 4.0 – 4.6 |
| September projection | 3.7 | 3.5 | 3.5 | 3.7 | 4.5 | 3.7 | 3.4 – 3.6 | 3.4 – 3.8 | 3.5 – 4.0 | 4.3 – 4.6 | 3.7 – 3.8 | 3.4 – 3.8 | 3.3 – 4.0 | 3.4 – 4.2 | 4.0 – 4.6 |
| PCE inflation | 1.9 | 1.9 | 2.1 | 2.1 | 2.0 | 1.8 – 1.9 | 1.8 – 2.1 | 2.0 – 2.1 | 2.0 – 2.1 | 2.0 | 1.8 – 1.9 | 1.8 – 2.2 | 2.0 – 2.2 | 2.0 – 2.3 | 2.0 |
| September projection | 2.1 | 2.0 | 2.1 | 2.1 | 2.0 | 2.0 – 2.1 | 2.0 – 2.1 | 2.1 – 2.2 | 2.0 – 2.2 | 2.0 | 1.9 – 2.2 | 2.0 – 2.3 | 2.0 – 2.2 | 2.0 – 2.3 | 2.0 |
| Core PCE inflation[4] | 1.9 | 2.0 | 2.0 | 2.0 | | 1.8 – 1.9 | 2.0 – 2.1 | 2.0 – 2.1 | 2.0 – 2.1 | | 1.8 – 1.9 | 1.9 – 2.2 | 2.0 – 2.2 | 2.0 – 2.3 | |
| September projection | 2.0 | 2.1 | 2.1 | 2.1 | | 1.9 – 2.0 | 2.0 – 2.1 | 2.1 – 2.2 | 2.0 – 2.2 | | 1.9 – 2.0 | 2.0 – 2.3 | 2.0 – 2.2 | 2.0 – 2.3 | |
| Memo: Projected appropriate policy path | | | | | | | | | | | | | | | |
| Federal funds rate | 2.4 | 2.9 | 3.1 | 3.1 | 2.8 | 2.4 | 2.6 – 3.1 | 2.9 – 3.4 | 2.6 – 3.1 | 2.5 – 3.0 | 2.1 – 2.4 | 2.4 – 3.1 | 2.4 – 3.6 | 2.4 – 3.6 | 2.5 – 3.5 |
| September projection | 2.4 | 3.1 | 3.4 | 3.4 | 3.0 | 2.1 – 2.4 | 2.9 – 3.4 | 3.1 – 3.6 | 2.9 – 3.6 | 2.8 – 3.0 | 2.1 – 2.4 | 2.1 – 3.6 | 2.1 – 3.9 | 2.1 – 4.1 | 2.5 – 3.5 |

NOTE: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant's projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The September projections were made in conjunction with the meeting of the Federal Open Market Committee on September 25–26, 2018. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the September 25–26, 2018, meeting, and one participant did not submit such projections in conjunction with the December 18–19, 2018, meeting.

1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.
2. The central tendency excludes the three highest and three lowest projections for each variable in each year.
3. The range for a variable in a given year includes all participants' projections, from lowest to highest, for that variable in that year.
4. Longer-run projections for core PCE inflation are not collected.

# Table 1.A. Economic projections for the first half of 2018*
# (in percent)

**Medians, central tendencies, and ranges**

| | Median | Central tendency | Range |
|---|---|---|---|
| Change in real GDP | 3.2 | 3.2 | 3.2 |
| September projection | 3.3 | 3.2 – 3.4 | 3.2 – 3.4 |
| PCE inflation | 2.2 | 2.2 | 2.2 |
| September projection | 2.2 | 2.2 | 2.2 |
| Core PCE inflation | 2.1 | 2.1 | 2.1 |
| September projection | 2.1 | 2.1 | 2.1 |

**Participants' projections**

| Projection | Change in real GDP | PCE inflation | Core PCE inflation |
|---|---|---|---|
| 1 | 3.2 | 2.2 | 2.1 |
| 2 | 3.2 | 2.2 | 2.1 |
| 3 | 3.2 | 2.2 | 2.1 |
| 4 | 3.2 | 2.2 | 2.1 |
| 5 | 3.2 | 2.2 | 2.1 |
| 6 | 3.2 | 2.2 | 2.1 |
| 7 | 3.2 | 2.2 | 2.1 |
| 8 | 3.2 | 2.2 | 2.1 |
| 9 | 3.2 | 2.2 | 2.1 |
| 10 | 3.2 | 2.2 | 2.1 |
| 11 | 3.2 | 2.2 | 2.1 |
| 12 | 3.2 | 2.2 | 2.1 |
| 13 | 3.2 | 2.2 | 2.1 |
| 14 | 3.2 | 2.2 | 2.1 |
| 15 | 3.2 | 2.2 | 2.1 |
| 16 | 3.2 | 2.2 | 2.1 |
| 17 | 3.2 | 2.2 | 2.1 |

* Growth and inflation are reported at annualized rates.

# Table 1.B. Economic projections for the second half of 2018*
# (in percent)

**Medians, central tendencies, and ranges**

| | Median | Central tendency | Range |
|---|---|---|---|
| Change in real GDP | 2.8 | 2.8 – 3.0 | 2.8 – 3.0 |
| September projection | 2.8 | 2.8 – 3.0 | 2.4 – 3.2 |
| PCE inflation | 1.6 | 1.4 – 1.6 | 1.4 – 1.6 |
| September projection | 1.9 | 1.8 – 2.0 | 1.6 – 2.2 |
| Core PCE inflation | 1.7 | 1.5 – 1.7 | 1.5 – 1.7 |
| September projection | 1.8 | 1.7 – 1.9 | 1.7 – 1.9 |

**Participants' projections**

| Projection | Change in real GDP | PCE inflation | Core PCE inflation |
|---|---|---|---|
| 1 | 3.0 | 1.6 | 1.7 |
| 2 | 2.8 | 1.4 | 1.7 |
| 3 | 3.0 | 1.6 | 1.7 |
| 4 | 3.0 | 1.4 | 1.7 |
| 5 | 3.0 | 1.6 | 1.5 |
| 6 | 2.8 | 1.4 | 1.5 |
| 7 | 2.8 | 1.6 | 1.7 |
| 8 | 3.0 | 1.6 | 1.7 |
| 9 | 2.8 | 1.6 | 1.7 |
| 10 | 2.8 | 1.6 | 1.5 |
| 11 | 2.8 | 1.4 | 1.5 |
| 12 | 3.0 | 1.6 | 1.7 |
| 13 | 2.8 | 1.4 | 1.5 |
| 14 | 2.8 | 1.4 | 1.7 |
| 15 | 2.8 | 1.6 | 1.7 |
| 16 | 3.0 | 1.6 | 1.7 |
| 17 | 3.0 | 1.4 | 1.7 |

* Projections for the second half of 2018 implied by participants' December projections for the first half of 2018 and for 2018 as a whole. Growth and inflation are reported at annualized rates.

**Table 2. December economic projections, 2018–21 and over the longer run (in percent)**

| Projection | Year | Change in real GDP | Unemployment rate | PCE inflation | Core PCE inflation | Federal funds rate |
|---|---|---|---|---|---|---|
| 1 | 2018 | 3.1 | 3.7 | 1.9 | 1.9 | 2.13 |
| 2 | 2018 | 3.0 | 3.7 | 1.8 | 1.9 | 2.38 |
| 3 | 2018 | 3.1 | 3.7 | 1.9 | 1.9 | 2.38 |
| 4 | 2018 | 3.1 | 3.7 | 1.8 | 1.9 | 2.38 |
| 5 | 2018 | 3.1 | 3.7 | 1.9 | 1.8 | 2.38 |
| 6 | 2018 | 3.0 | 3.7 | 1.8 | 1.8 | 2.38 |
| 7 | 2018 | 3.0 | 3.7 | 1.9 | 1.9 | 2.38 |
| 8 | 2018 | 3.1 | 3.7 | 1.9 | 1.9 | 2.38 |
| 9 | 2018 | 3.0 | 3.7 | 1.9 | 1.9 | 2.38 |
| 10 | 2018 | 3.0 | 3.7 | 1.9 | 1.8 | 2.38 |
| 11 | 2018 | 3.0 | 3.7 | 1.8 | 1.8 | 2.38 |
| 12 | 2018 | 3.1 | 3.7 | 1.9 | 1.9 | 2.38 |
| 13 | 2018 | 3.0 | 3.7 | 1.8 | 1.8 | 2.38 |
| 14 | 2018 | 3.0 | 3.7 | 1.8 | 1.9 | 2.38 |
| 15 | 2018 | 3.0 | 3.7 | 1.9 | 1.9 | 2.13 |
| 16 | 2018 | 3.1 | 3.7 | 1.9 | 1.9 | 2.38 |
| 17 | 2018 | 3.1 | 3.7 | 1.8 | 1.9 | 2.38 |
| 1 | 2019 | 2.5 | 3.4 | 1.9 | 1.9 | 2.38 |
| 2 | 2019 | 2.4 | 3.4 | 1.9 | 2.0 | 3.13 |
| 3 | 2019 | 2.3 | 3.5 | 1.9 | 2.0 | 3.13 |
| 4 | 2019 | 2.3 | 4.0 | 2.1 | 2.1 | 2.88 |
| 5 | 2019 | 2.5 | 3.7 | 1.9 | 1.9 | 2.38 |
| 6 | 2019 | 2.3 | 3.7 | 2.0 | 2.0 | 3.13 |
| 7 | 2019 | 2.2 | 3.4 | 1.8 | 2.0 | 2.88 |
| 8 | 2019 | 2.6 | 3.6 | 2.1 | 2.0 | 2.63 |
| 9 | 2019 | 2.2 | 3.5 | 2.1 | 2.1 | 2.63 |
| 10 | 2019 | 2.4 | 3.5 | 1.8 | 2.0 | 2.88 |
| 11 | 2019 | 2.7 | 3.7 | 1.8 | 2.0 | 2.88 |
| 12 | 2019 | 2.3 | 3.5 | 1.8 | 2.0 | 2.88 |
| 13 | 2019 | 2.0 | 3.5 | 2.0 | 2.1 | 3.13 |
| 14 | 2019 | 2.4 | 3.5 | 2.0 | 2.0 | 3.13 |
| 15 | 2019 | 2.4 | 3.5 | 2.2 | 2.2 | 2.63 |
| 16 | 2019 | 2.3 | 3.5 | 1.8 | 2.0 | 3.13 |
| 17 | 2019 | 2.3 | 3.5 | 2.0 | 2.1 | 2.63 |

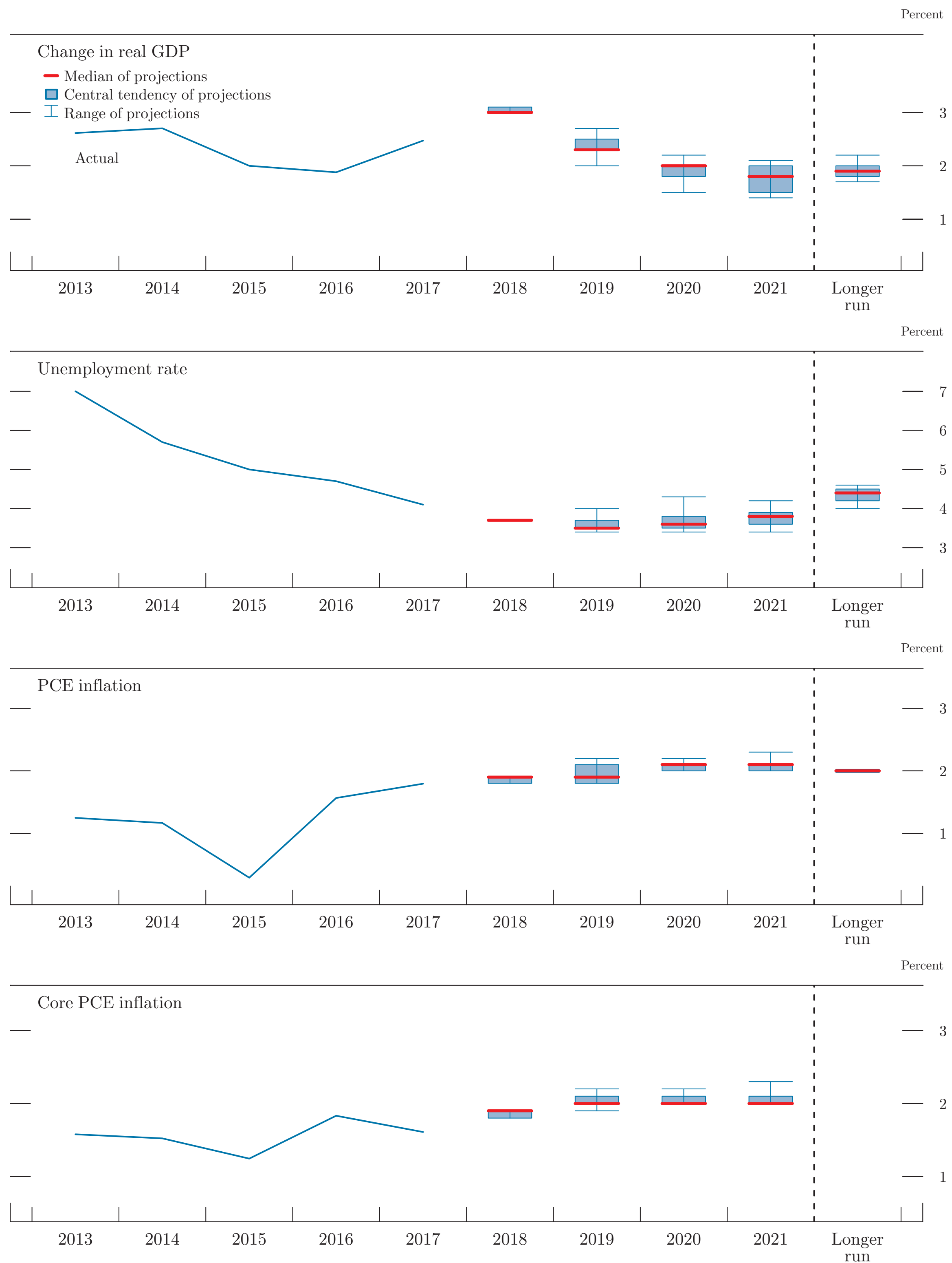
**Table 2.** ***(continued)***

| Projection | Year | Change in real GDP | Unemployment rate | PCE inflation | Core PCE inflation | Federal funds rate |
|---|---|---|---|---|---|---|
| 1 | 2020 | 2.0 | 3.4 | 2.1 | 2.0 | 2.63 |
| 2 | 2020 | 1.7 | 3.4 | 2.1 | 2.1 | 3.38 |
| 3 | 2020 | 1.9 | 3.5 | 2.1 | 2.1 | 3.13 |
| 4 | 2020 | 1.8 | 4.3 | 2.1 | 2.0 | 2.88 |
| 5 | 2020 | 2.0 | 4.0 | 2.0 | 2.0 | 2.38 |
| 6 | 2020 | 2.0 | 3.8 | 2.1 | 2.0 | 3.38 |
| 7 | 2020 | 1.8 | 3.5 | 2.1 | 2.1 | 3.13 |
| 8 | 2020 | 2.0 | 4.0 | 2.1 | 2.0 | 2.88 |
| 9 | 2020 | 1.7 | 3.6 | 2.2 | 2.2 | 2.88 |
| 10 | 2020 | 2.0 | 3.4 | 2.0 | 2.0 | 2.88 |
| 11 | 2020 | 2.2 | 3.7 | 2.1 | 2.1 | 3.63 |
| 12 | 2020 | 2.0 | 3.5 | 2.0 | 2.0 | 3.13 |
| 13 | 2020 | 1.5 | 3.6 | 2.2 | 2.2 | 3.63 |
| 14 | 2020 | 2.2 | 3.5 | 2.0 | 2.0 | 3.38 |
| 15 | 2020 | 2.0 | 3.7 | 2.1 | 2.1 | 2.88 |
| 16 | 2020 | 1.9 | 3.6 | 2.1 | 2.1 | 3.13 |
| 17 | 2020 | 1.8 | 3.7 | 2.0 | 2.0 | 2.88 |
| 1 | 2021 | 1.9 | 3.4 | 2.1 | 2.1 | 2.63 |
| 2 | 2021 | 1.5 | 3.6 | 2.1 | 2.1 | 3.13 |
| 3 | 2021 | 1.6 | 3.7 | 2.1 | 2.1 | 3.13 |
| 4 | 2021 | 2.0 | 4.1 | 2.1 | 2.0 | 2.63 |
| 5 | 2021 | 2.0 | 4.2 | 2.0 | 2.0 | 2.38 |
| 6 | 2021 | 1.9 | 3.9 | 2.1 | 2.0 | 3.38 |
| 7 | 2021 | 1.5 | 3.7 | 2.1 | 2.1 | 3.13 |
| 8 | 2021 | 1.9 | 4.0 | 2.1 | 2.0 | 2.63 |
| 9 | 2021 | 1.5 | 3.8 | 2.2 | 2.2 | 2.88 |
| 10 | 2021 | 1.8 | 3.4 | 2.0 | 2.0 | 2.88 |
| 11 | 2021 | 2.1 | 3.8 | 2.1 | 2.1 | 3.63 |
| 12 | 2021 | 1.8 | 3.6 | 2.0 | 2.0 | 3.13 |
| 13 | 2021 | 1.4 | 3.7 | 2.3 | 2.3 | 3.63 |
| 14 | 2021 | 2.0 | 3.7 | 2.0 | 2.0 | 3.13 |
| 15 | 2021 | 2.0 | 3.9 | 2.0 | 2.0 | 2.88 |
| 16 | 2021 | 1.6 | 3.8 | 2.2 | 2.2 | 3.13 |
| 17 | 2021 | 1.8 | 3.9 | 2.0 | 2.0 | 2.88 |

**Table 2. *(continued)***

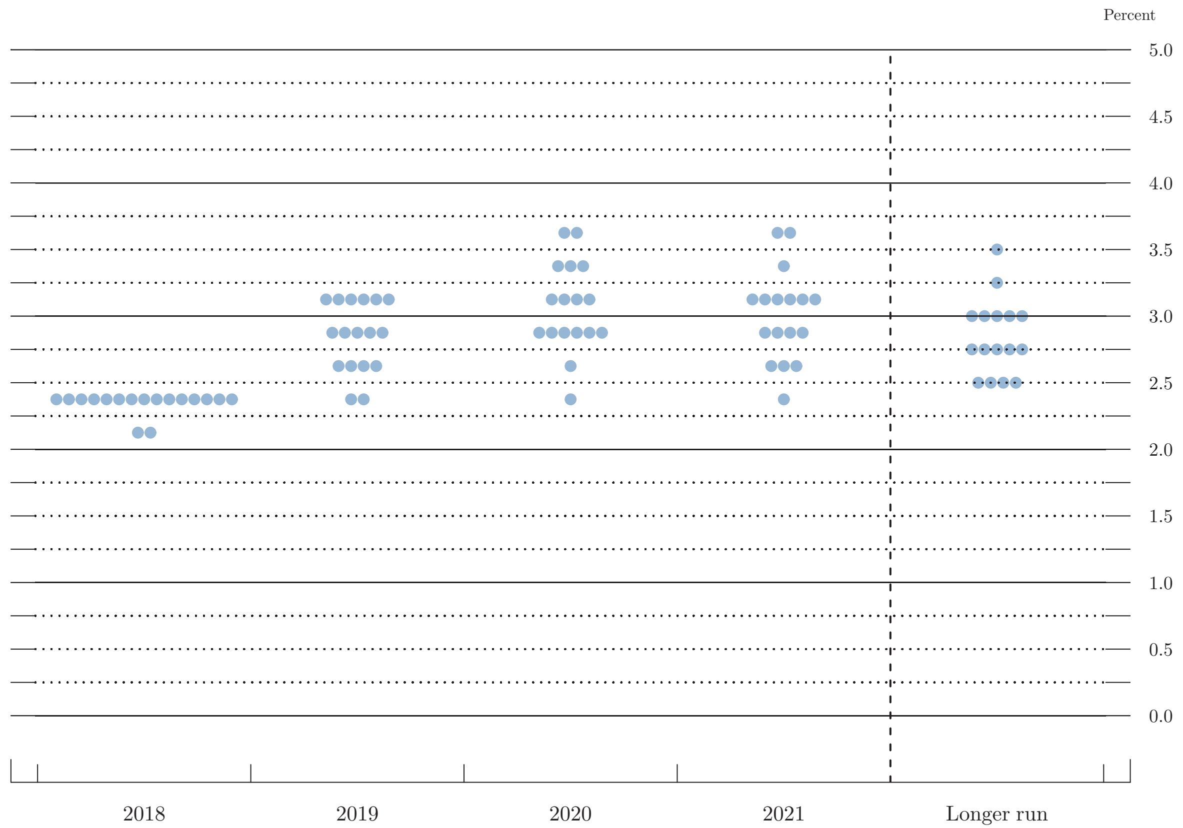
| Projection | Year | Change in real GDP | Unemployment rate | PCE inflation | Core PCE inflation | Federal funds rate |
|---|---|---|---|---|---|---|
| 1 | LR | 1.7 | 4.0 | 2.0 | | 2.50 |
| 2 | LR | 1.9 | 4.3 | 2.0 | | 3.00 |
| 3 | LR | 1.8 | 4.5 | 2.0 | | 2.50 |
| 4 | LR | 2.2 | 4.1 | 2.0 | | 2.50 |
| 5 | LR | | | 2.0 | | |
| 6 | LR | 2.0 | 4.5 | 2.0 | | 3.50 |
| 7 | LR | 1.7 | 4.5 | 2.0 | | 2.75 |
| 8 | LR | 2.1 | 4.0 | 2.0 | | 2.50 |
| 9 | LR | 1.8 | 4.6 | 2.0 | | 2.75 |
| 10 | LR | 1.8 | 4.4 | 2.0 | | 3.00 |
| 11 | LR | 2.1 | 4.3 | 2.0 | | 3.25 |
| 12 | LR | 2.0 | 4.2 | 2.0 | | 3.00 |
| 13 | LR | 1.7 | 4.6 | 2.0 | | 2.75 |
| 14 | LR | 2.0 | 4.5 | 2.0 | | 3.00 |
| 15 | LR | 2.0 | 4.5 | 2.0 | | 2.75 |
| 16 | LR | 1.8 | 4.3 | 2.0 | | 2.75 |
| 17 | LR | 1.8 | 4.2 | 2.0 | | 3.00 |

Figure 1. Medians, central tendencies, and ranges of economic projections, 2018–21 and over the longer run



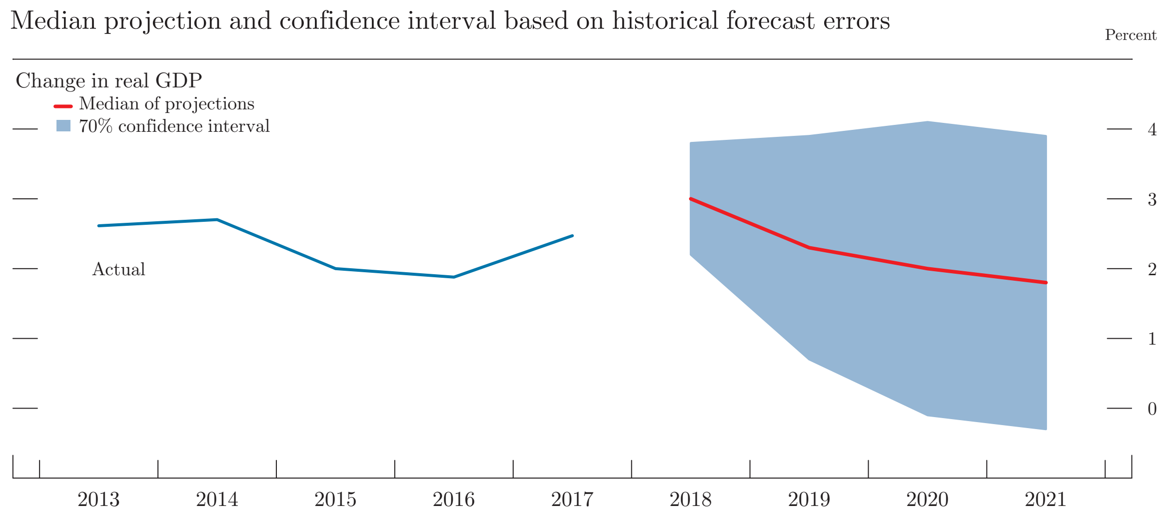

Note: Definitions of variables and other explanations are in the notes to table 1. The data for the actual values of the variables are annual.

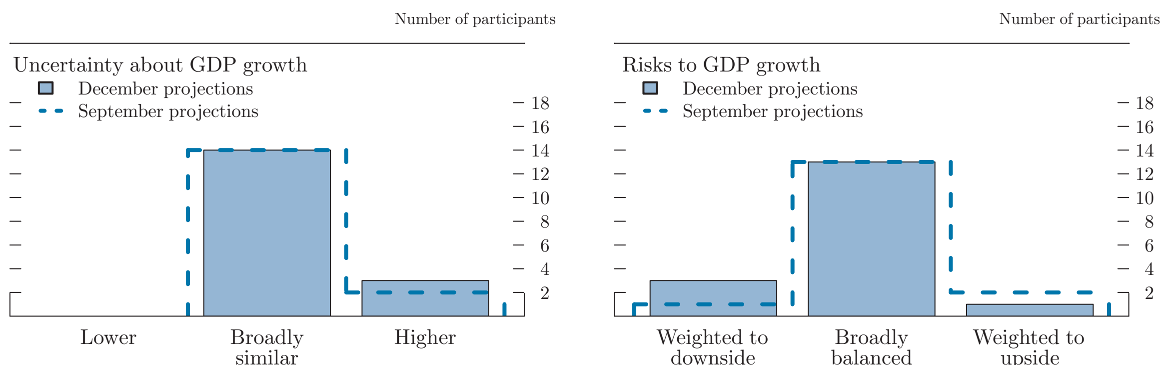
Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate




NOTE: Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. One participant did not submit longer-run projections for the federal funds rate.

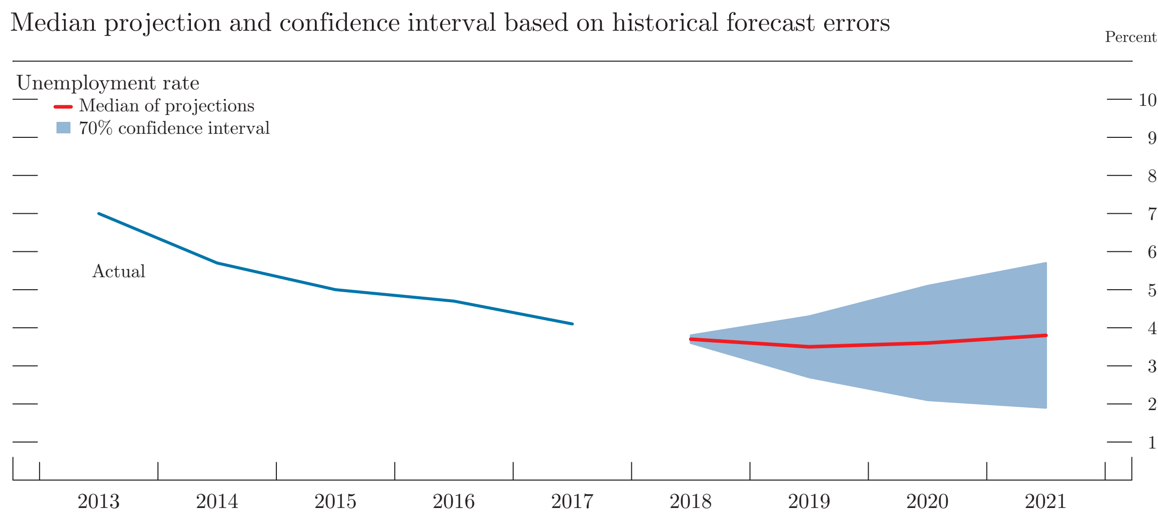
Figure 4.A. Uncertainty and risks in projections of GDP growth

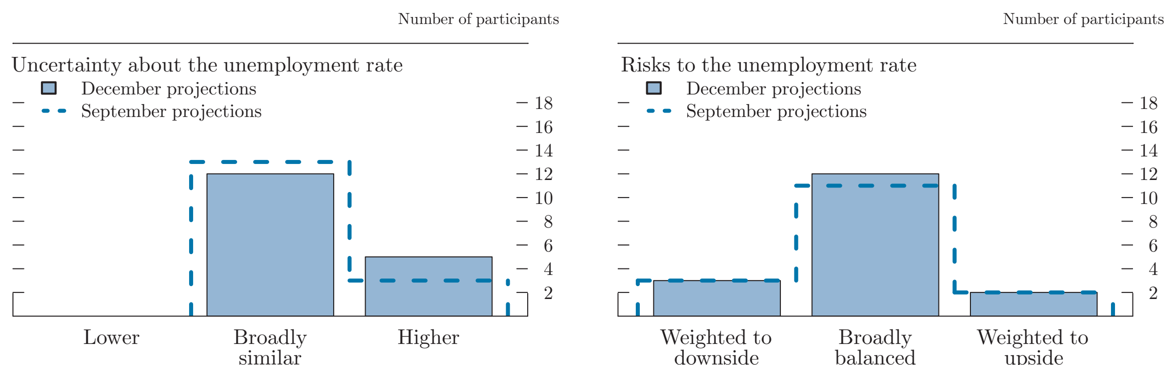



Note: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

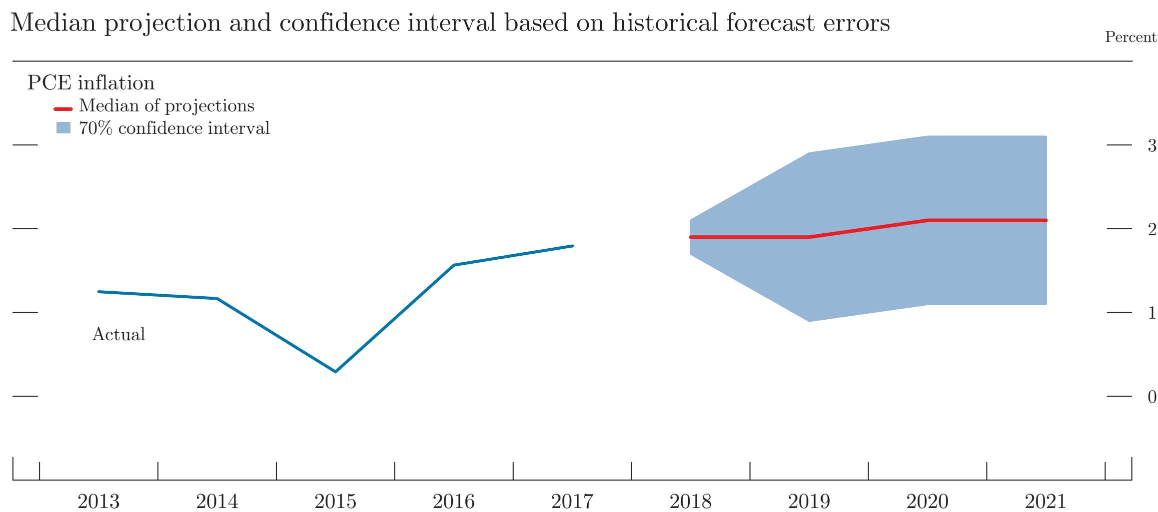
Figure 4.B. Uncertainty and risks in projections of the unemployment rate

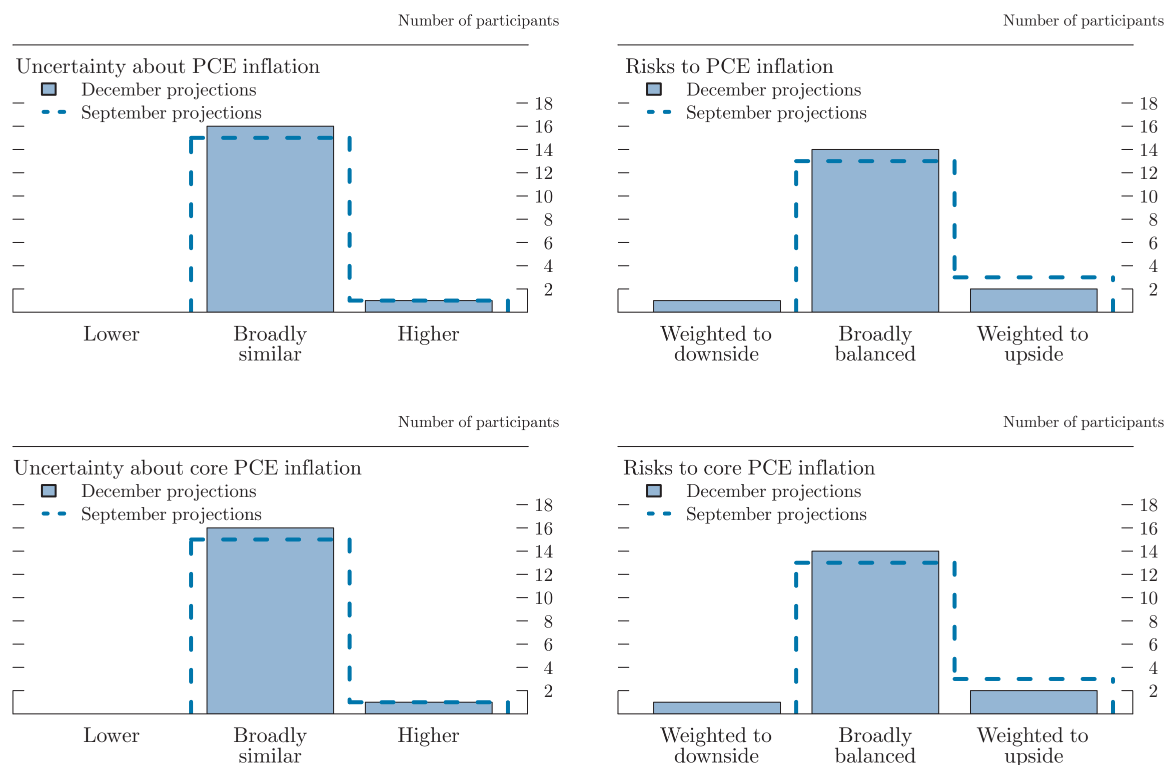



NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 4.C. Uncertainty and risks in projections of PCE inflation




Note: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in the price index for personal consumption expenditures (PCE) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

## Table 3. Uncertainty and risks

### Question 2(a): Please indicate your judgment of the uncertainty attached to your projections relative to levels of uncertainty over the past 20 years.

**Individual responses**

| Respondent | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Change in real GDP | B | B | B | B | B | B | B | B | A | B | B | B | A | B | A | B | B |
| Unemployment rate | B | B | B | A | B | B | B | A | A | B | B | B | A | B | A | B | B |
| PCE Inflation | B | B | B | B | B | B | B | B | B | B | B | B | A | B | B | B | B |
| Core PCE Inflation | B | B | B | B | B | B | B | B | B | B | B | B | A | B | B | B | B |

A = Higher  B = Broadly similar  C = Lower

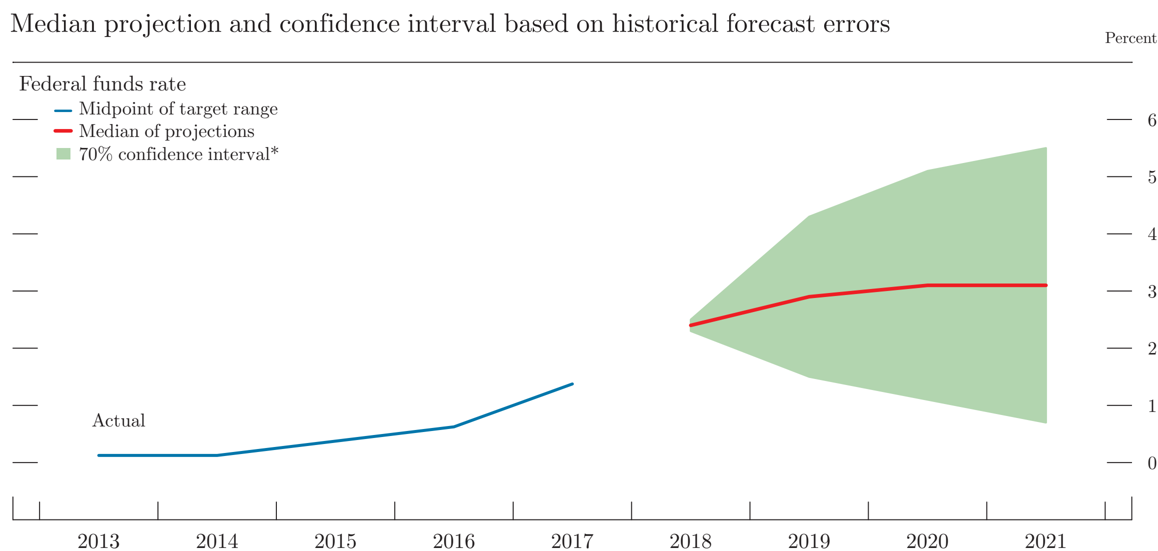
### Question 2(b): Please indicate your judgment of the risk weighting around your projections.

**Individual responses**

| Respondent | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Change in real GDP | B | C | B | B | A | B | B | B | C | B | B | B | B | B | C | B | B |
| Unemployment rate | B | A | B | C | B | B | B | B | B | B | C | B | C | B | A | B | B |
| PCE Inflation | B | B | B | B | A | B | B | B | B | B | B | B | A | B | C | B | B |
| Core PCE Inflation | B | B | B | B | A | B | B | B | B | B | B | B | A | B | C | B | B |

A = Weighted to upside  B = Broadly balanced  C = Weighted to downside

Figure 5. Uncertainty in projections of the federal funds rate




NOTE: The blue and red lines are based on actual values and median projected values, respectively, of the Committee's target for the federal funds rate at the end of the year indicated. The actual values are the midpoint of the target range; the median projected values are based on either the midpoint of the target range or the target level. The confidence interval around the median projected values is based on root mean squared errors of various private and government forecasts made over the previous 20 years. The confidence interval is not strictly consistent with the projections for the federal funds rate, primarily because these projections are not forecasts of the likeliest outcomes for the federal funds rate, but rather projections of participants' individual assessments of appropriate monetary policy. Still, historical forecast errors provide a broad sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that may be appropriate to offset the effects of shocks to the economy.

The confidence interval is assumed to be symmetric except when it is truncated at zero—the bottom of the lowest target range for the federal funds rate that has been adopted in the past by the Committee. This truncation would not be intended to indicate the likelihood of the use of negative interest rates to provide additional monetary policy accommodation if doing so was judged appropriate. In such situations, the Committee could also employ other tools, including forward guidance and large-scale asset purchases, to provide additional accommodation. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections.

* The confidence interval is derived from forecasts of the average level of short-term interest rates in the fourth quarter of the year indicated; more information about these data is available in table 2. The shaded area encompasses less than a 70 percent confidence interval if the confidence interval has been truncated at zero.

# Longer-run Projections

## Question 1(c). If you anticipate that the convergence process will take SHORTER OR LONGER than about five or six years, please indicate below your best estimate of the duration of the convergence process. You may also include below any other explanatory comments that you think would be helpful.

**Respondent 1:** N/A

**Respondent 2:** N/A

**Respondent 3:** Developments since the September SEP, including the productivity data, indicate that the U.S. economy still appears to be experiencing low trend productivity growth. Therefore, I have not changed my estimate of 1 3/4 percent for longer-run real GDP growth. The evidence also points to no change in my estimate for the longer-run normal rate of unemployment of around 4 1/2 percent.

I assume that long-term inflation expectations will remain anchored at levels consistent with the FOMC's longer-run objective. Under those conditions, the monetary policy stance will be consistent with a small overshooting of inflation and an undershooting of the longer-run normal unemployment rate for the next several years. I expect these variables to return to their longer-run levels by the mid-2020s.

**Respondent 4:** N/A

**Respondent 5:** We expect values of headline and core inflation to be on or very close to target in 2018 and beyond, but GDP growth and unemployment are expected to deviate from their long-run values conditional on the current regime. This regime, characterized by low productivity growth and a low real interest on short-term government debt, features GDP growth of 2.0 percent, and unemployment rate of 4.5 percent, and inflation of 2.0 percent. The projected deviations, due in part to federal stimulus, are expected to be temporary. We project that the overshooting of GDP will end in 2020 and the undershooting of unemployment will end in 2022. Because there are multiple potential medium term outcomes, we cannot provide a single set of projections for GDP growth and unemployment. Calculating an average of these variables based on the outcomes in multiple regimes is potentially misleading. We do provide a 2.0 percent longer-run inflation projection that is independent of the regime.

**Respondent 6:** N/A

**Respondent 7:** Our policy goals have effectively been reached. However, it will take some time to achieve sustained convergence to longer-run levels. The fiscal stimulus and past accommodative monetary policy will keep the unemployment rate well below the natural rate for several years before it returns back a longer-run sustainable level. This overshooting of full employment is accompanied by a very modest overshooting of the inflation target.

**Respondent 8:** N/A

**Respondent 9:** We are at our inflation target but past full employment. We believe that growth will slow in 2019 and 2020 and this should at least stabilize the employment gap. If growth slows as we expect, it is possible that we will be more vulnerable to adverse shocks and policy missteps.

**Respondent 10:** I expect the convergence process will take shorter than five years. Real GDP growth will likely decelerate to its longer-run level in the next few years. PCE inflation will likely decline in the near term reflecting lower energy prices, but I expect inflation to return to two percent over the next year. Whether the unemployment rate will eventually converge toward my estimate of its longer-run level is uncertain. Although I see the unemployment rate remaining below my estimate of its longer-run level over the forecast horizon, there is substantial uncertainty around estimates of the longer-run unemployment rate. Should the unemployment rate stabilize at a low level without signs of building inflationary pressures, that would suggest that such a level may

be consistent with sustainable growth over the medium term. Taking into account the uncertainty about the longer-run unemployment rate, and looking through an energy-related decline in inflation, we have in my view essentially achieved our objectives for inflation and unemployment.

I reduced my estimate of the longer-run unemployment rate, in light of the downward surprise to core PCE inflation since June 2018, when I last revised this estimate. A declining longer-run unemployment rate is consistent with ongoing demographic changes, such as the aging of the workforce.

**Respondent 11:** N/A

**Respondent 12:** N/A

**Respondent 13:** The forecast has the unemployment rate declining through next year, remaining steady in 2020 as growth slows, and then rising starting in 2021 as growth edges down further below potential. Thereafter, a prolonged "growth recession" is needed for the unemployment rate to return to its equilibrium level. Assuming that the federal funds rate does not rise much above its 2021 level, a model driven forecast would say that it will likely take 5 or 6 additional years for the unemployment rate to converge to its long-run rate from below. In practice, the likelihood of achieving this type of soft landing, over such a long period, is small. Indeed, the historical record places a high probability on a recession occurring once growth starts to slow below potential.

**Respondent 14:** N/A

**Respondent 15:** I anticipate that the economy will converge to my longer-run projection within 5 years.

**Respondent 16:** N/A

**Respondent 17:** N/A

# Uncertainty and Risks

## Question 2(a). (Optional) If you have any explanatory comments regarding your judgment of the uncertainty attached to your projections relative to levels of uncertainty over the past 20 years, you may enter them below.

**Respondent 1:** The current level of uncertainty lies somewhere between the low levels experienced during the Great Moderation and the high levels experienced during the financial crisis and its immediate aftermath. Changes in trade policy and other financial and international developments have increased the uncertainty around my forecasts, but not significantly.

**Respondent 2:** N/A

**Respondent 3:** Uncertainty around my projections for economic activity and inflation may be a little higher than in September, but it is still roughly similar to their respective average levels over the past 20 years (the SEP standard). Continued trade tensions, the turbulence in financial markets, the impact of slower global growth on the U.S. economy, escalated political tensions in Europe, and the future path of fiscal policy are sources of greater uncertainty. However, economic developments since the September SEP have been largely consistent with my outlook, which offsets some of that uncertainty.

**Respondent 4:** Elevated uncertainty about u*. Another strong year for employment, hours (and productivity at least in business sector), and Core PCE is running at 1.8 and nominal wages up 3.1 in line with productivity and inflation. This is the lowest unemployment rate in 50 years but I'm looking at the data to learn about where u* is today .

**Respondent 5:** N/A

**Respondent 6:** My contacts in the business community appear to be more uncertain about the growth outlook than they were in September. That said, uncertainty does not appear to be materially greater than it has averaged for the last 20 years.

**Respondent 7:** Uncertainty about my projection for economic activity and inflation is similar to its average level over the past 20 years. Inflation remains anchored by stable longer-run inflation expectations at the FOMC's stated goal of 2 percent.

**Respondent 8:** N/A

**Respondent 9:** An awareness that real growth is slowing and is likely to slow further has begun to sink in. With that new awareness has come an increased recognition of the economy's vulnerability to adverse shocks and policy missteps, and an increased sense of unease. Political-economy risks in the U.S. and abroad have multiplied. These political economy risks are likely to spill over into company results, and then spill over into economic results. We believe this is already beginning to happen. The list of risks includes–but is by no means limited to–trade and tariff disputes, concerns about debt sustainability in Italy, the possibility of a hard Brexit, new leadership in Mexico, domestic and trade decisions by China, OPEC decisions regarding production levels, and the threat of a U.S. government shutdown.

**Respondent 10:** N/A

**Respondent 11:** N/A

**Respondent 12:** N/A

**Respondent 13:** While the forecasting exercise under current conditions may not be as uncertain as during the Great Recession, we have little experience forecasting inflation dynamics at very low unemployment rates, as well as guiding the economy through a protracted growth recession. More directly related to our current outlook, we assume very limited effects from the change in tariffs, but it is possible that the disruption in global trade will be broad-based enough to affect the economy in ways not captured by our models. The tariffs could also feed through to domestic prices more than anticipated. There could also be spillovers from the recent increase in financial market volatility that are not well captured by our models, and there are potential financial stability concerns associated with keeping interest rates relatively low given an economy that is forecasted to be significantly above full employment for an extended period of time.

**Respondent 14:** N/A

**Respondent 15:** Uncertainty surrounding output growth and unemployment remains elevated by heightened uncertainty about the effects of fiscal stimulus and the future course of both trade and fiscal policy. The impact on inflation uncertainty is less pronounced given how flat the Phillips curve seems to be.

**Respondent 16:** Fiscal and trade policy continue to be a key source of uncertainty to the outlook. In addition, the extent to which recent changes in financial conditions might impact consumer and business sentiment and spending is unclear. We also see the range of outcomes for world growth, especially those of our major trading partners, as somewhat wider than in the recent past. Finally, the recent data on inflation and inflation expectations have modestly increased the uncertainty around our inflation forecast. Nevertheless, we do not think that these changes have risen to a degree that would alter our characterization of uncertainty as broadly similar to historical levels.

**Respondent 17:** N/A

# Uncertainty and Risks (continued)

## Question 2(b). (Optional) If you have any explanatory comments regarding your judgment of the risk weighting around your projections, you may enter them below.

**Respondent 1:** Although downside risks have increased some, risks are roughly balanced.

**Respondent 2:** The risks to the foreign outlook are mounting.

**Respondent 3:** The risks to real economic activity appear to be broadly balanced over the forecast horizon. The primary downside risks come from the possibility that trade tensions, political events in Europe, and slower global growth could further impact financial markets, eventually leading to significantly tighter financial conditions and slower growth for the U.S. economy. Another downside risk is that fiscal policy could become more restrictive than anticipated, which is somewhat more likely following the mid-term elections. One notable upside risk is that fiscal stimulus could have more positive demand- and/or supply-side effects than I anticipate. Possible stronger momentum associated with robust household and business confidence is another upside risk.

The risks to inflation also appear to be broadly balanced. A major upside risk is that aggregate demand pressures as well as the effects of higher tariffs and trade tensions could begin to put more upward pressure on inflation than has been apparent so far. A significant downside risk is that slower global growth, declines in oil prices, a stronger-than-anticipated foreign exchange value of the US dollar and subdued inflation in many advanced economies may weaken domestic inflationary pressures more than I have judged.

**Respondent 4:** N/A

**Respondent 5:** With respect to GDP growth, the current productivity regime is one of low growth. A higher productivity growth regime is possible, but we see no compelling reason to predict a switch at this time. Recent increases in productivity still leave productivity in its low regime. However, as changes in fiscal and regulatory policy continue to affect the economy, we see the possibility of more rapid GDP growth. On the other hand, we see US trade policy as generating some downward risk for growth. An additional factor is the possibility of yield-curve inversion. Further upward movements in the federal funds rate have typically been associated with recessions; however, we anticipate a lag of more than a year between yield-curve inversion and the onset of recession. Thus we, we view the risks on this variable as weighted to the upside.

Concerning unemployment, the current rate is at the low end for an economic expansion. If a recession were to occur, the unemployment rate would rise substantially and quickly. We have no compelling reason to predict a recession during the forecast horizon. The interaction between US and foreign trade policies raises the possibility of trade disruptions that might increase unemployment. On the other hand, we also see the possibility of further declines in the unemployment rate if GDP growth surprises on the upside. Federal stimulus associated with tax and spending changes might produce such a surprise. Overall, we see the risks as balanced.

For core PCE inflation, we place negligible weight on the prospects of Phillips Curve effects. However, there is a risk that Phillips Curve effects reassert themselves and inflation moves higher as the unemployment rate falls. It is also possible that inflation expectations drift higher and become unanchored. In addition, federal stimulus associated with recent tax and spending changes could push prices higher. Trade policy changes might also put some upward pressure on import prices. Anecdotal reports are consistent with increasing price pressures. Thus we, we view the risks on this variable as weighted to the upside.

For PCE inflation, the risks are the same as for core PCE inflation. In addition, the variable depends on the behavior of energy prices, whose recent declines are incorporated in our projections. While an upward energy-price shock is a possibility, a case can be made for some further downward drift in energy prices. Overall, we view the risks for PCE inflation as weighted to the upside.

**Respondent 6:** Of the three choices, I feel that "broadly balanced" best captures my view. However, I do lean in the direction of putting the risk of overheating higher than the risk of excessive monetary restraint.

**Respondent 7:** Risks to projected economic activity appear broadly balanced. On the upside, the economy continues to show higher than expected momentum. On the downside, the effects of a higher federal funds rate may be more powerful than expected, as suggested by the tightening of financial market conditions and cooling of the housing market this year. Further downside risk arises from a greater escalation of the tariff war and much weaker growth abroad.

**Respondent 8:** N/A

**Respondent 9:** Our internal models have shown a sequence of downgrades to the 2019:H1 GDP growth outlook, and any of a variety of global political-economy risks, if realized, would adversely affect U.S. GDP growth in 2019. Symptoms of this slowing are already manifesting themselves in corporate results and forward guidance regarding earnings.

**Respondent 10:** N/A

**Respondent 11:** N/A

**Respondent 12:** N/A

**Respondent 13:** With the economy growing above potential, labor markets are expected to tighten further. In recent quarters, the additional demand for labor has been accompanied by improvements in the cyclical position of labor force participation. There is a risk that the additional demand will not be met by increased participation and the labor force participation rate will decline consistent with its demographically-driven downward trend. This scenario would lead to a more pronounced decline in the unemployment rate than we anticipate and place more upward pressure on wages and prices.

**Respondent 14:** Downside risks to output growth have increased since my last SEP submission. But incoming data, including weak investment spending, have led me to revise down my path for GDP growth, and I see risks around this now somewhat lower path as broadly balanced. Similarly, I see risks as broadly balanced around my slightly higher unemployment rate path. I have made little change to my inflation path and continue to see risks to inflation as broadly balanced.

The U.S. economy remains in a healthy position, with output and employment growing above trend, the unemployment rate below estimates of its longer-run natural rate, and inflation near 2 percent. Nevertheless, sentiment about the global economic outlook has deteriorated, uncertainties over trade policy remain unresolved, financial market volatility has increased, stock prices have fallen, and corporate credit spreads have increased. Downside risks include slower than anticipated growth in China and in Europe, the possibility of a hard Brexit, increasing uncertainty around trade policy and higher tariffs, losses on high levels of leveraged lending to weaker borrowers, the possibility that the moves in financial markets are signaling weaker underlying fundamentals, further deterioration in sentiment, and further pull-back in risk-taking. On the other hand, there are some upside risks, too, since these situations could turn out to be better than what is built into forecasts. For example, the resolution of uncertainty over the trade situation is an upside risk to the forecast. In addition, fiscal stimulus (tax cuts and increased government spending) added to growth in 2018; I expect the stimulative effects to wane over the forecast but there are two-sided risks around that expectation. Tax refunds next year could turn out to be higher than anticipated as households may not have completely adjusted withholding rates. Thus, higher refunds could boost household spending in the first half of next year, with this effect fading in the second half.

I continue to see inflation risks as roughly balanced. Inflation rates are currently near 2 percent. Looking through the temporary downturn in headline inflation that will result from recent declines in energy prices, I expect that inflation rates will be near 2 percent over the medium run. However, with labor markets tight or if nonlinear Phillips curve dynamics begin to kick in, inflation could move higher than I anticipate. Tariffs present firms with an opportunity to raise prices. To the extent that these are one-o changes, they should not raise the inflation rate. However, a continued roll-out of tariffs over time could lead to continued one-o changes in inflation; this could push up inflation expectations and lead to higher inflation rates over time.

The value of the dollar has been rising since the spring. I expect somewhat further appreciation given the relative strength of the U.S. economy and prospects for tighter monetary policy compared to abroad. But the risks

around the path of the dollar are two-sided. A considerably stronger-than-expected appreciation in the dollar poses a downside risk to the inflation forecast.

Risks to financial stability appear elevated – leverage lending is at high levels and underwriting standards on this debt have deteriorated; commercial real estate valuations continue to be lofty. Financial vulnerabilities could amplify an economic slowdown.

**Respondent 15:** Recent volatility in asset markets, declines in inflation compensation measures, falling oil prices, and indications of slowing growth abroad have shifted my perception of the risk surrounding my forecast. As well, I remain uncertain about the extent to which fiscal stimulus may be masking underlying growth and inflation. I remain concerned about the potential magnitude of adverse effects on the economy from international trade conflicts.

**Respondent 16:** We see the risks to the outlook for both growth and inflation as broadly balanced.

We still see the odds as roughly equal that fiscal policy will result in a bit more, or a bit less, stimulus than we built into our projection. International developments pose a downside risk; growth abroad is somewhat softer than expected and trade war scenarios have yet to abate. In addition, changes in financial conditions could weigh more heavily on business and household sentiment and spending than in our forecast. We do not want to overstate these risks, however. To date, measures of aggregate financial market conditions and foreign growth prospects have not deteriorated that much (for example, by much less than in 2015 and 2016). And it is unclear how much of recent financial market movements are largely noise (as the Tealbook assumes) or simply reflect more market participants taking on board a slowing in activity along the lines in our baseline projection. In sum, while downside risks may have increased some, we do not think it is by enough to move the overall balance of risks into the downside bucket.

The recent softening in core inflation and lack of a firming in inflation expectations suggest that underlying inflation trends may not be rising to the degree we assume in our baseline forecast. In addition, some of the international risks noted above could lead to appreciation of the dollar and lower U.S. inflation. In contrast, the anecdotes from our business contacts about intensifying costs with pass-through to customer prices point to building inflationary pressures. Furthermore, our concern about the recent low readings on inflation may be an overreaction to noisy data. There also is a risk that tariffs could show through more visibly to consumer prices.

**Respondent 17:** N/A

# Key Factors Informing Your Judgments regarding the Appropriate Path of the Federal Funds Rate

**Question 3(b). Please describe the key factors informing your judgments regarding the appropriate path of the federal funds rate. If, in your projections for any year in the projection period, the unemployment rate for that year is close to or below your projection for its longer-run normal level and inflation for that year is close to or above 2 percent, and your assessment of the appropriate level of the federal funds rate for that year is still significantly below your assessment of its longer-run normal value, please describe the factor or factors that you anticipate will make the lower-than-normal funds rate appropriate. If you have revised your estimate of the longer-run normal value of the federal funds rate since the previous SEP, please indicate the factor or factors accounting for the change. You may include any other comments on appropriate monetary policy as well.**

**Respondent 1:** After running below our 2 percent target for quite some time, inflation had essentially returned to target earlier in the year. However, recent inflation readings have been on the soft side. While job gains remain strong and the unemployment rate is below 4 percent, it is not clear that we have reached maximum employment as the labor force participation rate and employment-population ratio for prime age persons remain well below their pre-recession levels, and wage growth remains subdued. Given the persistent undershooting of our inflation target, I believe that appropriate monetary policy implies a very gradual path of increases for the federal funds rate.

**Respondent 2:** My funds rate path continues on a gradual tightening path next year. Despite the recent tightening in financial conditions, indicators of the real economy suggest that above-trend growth is continuing. I have therefore adjusted my rate path only slightly. With inflation close to our objective, it will be desirable to stabilize growth around its longer-run sustainable pace sometime soon, a key reason that gradual tightening remains appropriate. One factor that works to offset in part the impact of tighter financial conditions on my funds rate path is my assumption of a larger terminal value of reserves; see question 4b for further details.

**Respondent 3:** The principal factors behind my assessment of the appropriate path for monetary policy are my estimate of the natural real rate of interest, my economic outlook, and the balance of risks around that outlook.

Most estimates for the natural rate have changed little since the September SEP, and so I have maintained my estimate of 1/2 percent. I will continue to monitor future data and estimates to determine if an adjustment to my assumption is necessary.

With a slight downgrade of my 2019 growth projection, a smaller projected overshoot of inflation, and somewhat tighter financial conditions than I previously anticipated, my assessment of the appropriate federal funds rate path is shallower than in September. In particular, I see the target federal funds rate range at the end of 2018 at 2 1/4 – 2 1/2 percent, the same as in my September SEP submission. However, I anticipate that the target range at the end of 2019, 2020 and 2021 will be 3 – 3 1/4 percent in each year: The end-2020 and end-2021 assessments are 50 basis points below those in my September submission. I still envision that the policy rate modestly overshoots its longer-run level in 2019 – 2021, as policy acts to unwind the small overshooting of inflation and tight labor market conditions. This path is flatter than some simple policy rules suggest, reflecting that inflation has been rising only gradually toward the FOMC's longer-run objective.

**Respondent 4:** If as I expect we decide to hike at this meeting, the upper bound of the range for the policy rate will coincide with the estimate of long run r* submitted by several members of the committee including me We have the luxury with core PCE running at 1.8 , with no cost push wage pressure evident, with headline inflation set to fall below target, and with several measures of expected PCE inflation remaining below 2 percent to be truly

data dependent as we assess both the pace and ultimate destination for the Federal funds rate. The forecasts from FRB/US and EDO reported on page 92 of the Teal book indicate that with a Fed Funds path similar to what I write down above, we can expect as of today for price stability to be maintained and for unemployment to return to r* in two years.

**Respondent 5:** A target of 2.38 percent for the forecast horizon is consistent with our assessment of current economic conditions and for the convergence of GDP growth and unemployment to their values in a regime characterized by low productivity growth and a low real interest rate on short-term government debt. A target of 2.38 is also consistent with the Fed's inflation target. We view additional increases in the federal funds rate as too aggressive given our projections. In the event of a regime change, such as a shift from low to high productivity growth, our target federal funds rate will change.

**Respondent 6:** The real federal funds rate will be about a half percent after our meeting, and it difficult for me to believe that this low rate will remain appropriate over time. Real growth in this submission is above trend next year, and labor markets are tight. Inflation is running near 2 percent and expectations appear well anchored. Under these conditions I believe that the funds rate needs to increase. I would note that although my submission projects 3 rate increases next year, I am open to the possibility of having fewer increases in 2019. I also believe that our balance sheet normalization should remain on autopilot.

**Respondent 7:** The labor market has exceeded full employment according to various measures and I expect it to continue to tighten with the unemployment rate bottoming out at 3.4 percent by the end of next year. The recent inflation numbers were a bit soft, but with the economy above potential, I anticipate inflation will be on target next year and then modestly overshoot beginning in 2020.

My assessment of appropriate policy is generally informed by looking at simple rules that assume a low natural rate of interest of 3/4 percent. My fed funds rate path is flatter than some simple rules would suggest. This reflects an inflation rate that has been rising only gradually toward our objective from below. Beyond the near term, I envision a path for the fed funds rate that modestly overshoots its longer-run level beginning in late 2019 through 2021 to keep the economy on a sustainable growth path and limit the modest overshooting of the inflation target.

**Respondent 8:** N/A

**Respondent 9:** I believe recent weakening in the outlook, coupled with our vulnerability to further weakening, make it unlikely that we will need to raise the funds rate above its longer-run neutral level. I would note that inflation is sufficiently tame and other imbalances sufficiently limited that the Federal Reserve has the ability to be patient in removing accommodation. I believe that the level of long-term interest rates–especially long-forward interest rates–conveys useful information about the longer-run neutral short-term interest rate, and I believe that a yield-curve inversion of any size or duration would signal that we've likely moved too far in our monetary policy decisions. My own view is that it is just as likely that long-term interest rates will move lower, rather than higher, over the next few years. As a result, my funds-rate path is fairly shallow.

**Respondent 10:** My judgment regarding the appropriate path of the federal funds rate is predicated on promoting sustainable economic growth and price stability. I anticipate it will be appropriate for the federal funds rate to rise in 2019 to near my estimate of its longer-run level, and to stay near that level over the remainder of the forecast horizon, for three main reasons. First, the economy is operating at or above full capacity, yet inflation remains moderate. While strong labor market conditions may eventually put more upward pressure on prices, structural and global factors appear to be disinflationary. With these offsetting pressures on inflation, I view a gradual path of the federal funds rate as important to collect more evidence that inflation will remain stable. Second, estimates of the equilibrium real interest rate and the longer-run unemployment rate are uncertain. The closer unemployment and inflation are to our objectives, the more this uncertainty favors a data dependent approach to monetary policy. Third, in this environment, a patient approach to monetary policy normalization will allow for the assessment of economic effects of past interest rate rises.

**Respondent 11:** N/A

**Respondent 12:** N/A

**Respondent 13:** With the economy running already beyond full employment and a policy stance that is still accommodative, it is difficult to determine an appropriate path for policy. A number of models and optimal control exercises call for a rapid tightening of policy in the near-term to get the unemployment rate back to equilibrium. However, such a swift tightening of policy would likely increase the probability of a recession in ways that our linear models are unable to capture. Our projected path for the federal funds rate tries to balance this concern against the concern that running an economy above full employment for an extended period of time may also create distortions that, too, could increase the probability of a future downturn. Given the underlying momentum in real activity, we believe it is appropriate to somewhat front load the policy increases next year and then tighten policy twice more in 2020 before stopping any rate hikes at least through 2021. Such a strategy would reduce the likelihood of further declines in the unemployment rate after next year, while providing policymakers time to assess how the economy responds to a contractionary policy stance. This path for policy also achieves the goal of turning the unemployment rate around before the end of the forecast horizon, rather than moving further from full employment, which would occur with a slightly more gradual policy path.

**Respondent 14:** Over 2017 and 2018, the policy rate has been moving toward the range of estimates of the neutral rate. There has been a compelling case to move the policy rate up given the economy's strength – characterized by above-trend growth and tight labor markets – and the fact that inflation has moved up to 2 percent. We are now getting closer to a new phase in which to determine appropriate policy settings the Committee needs to be even more attentive to the evolution of economic conditions and their implications for the medium run outlook and the risks around the outlook.

My modal outlook is for the economy and labor markets to remain strong over the forecast horizon. I project that growth will be slowing to trend over the forecast horizon and that the unemployment rate will remain well below my 4.5 percent estimate of its longer-run level. I anticipate that tight labor market conditions will translate into some continued firming in the labor compensation measures, in line with anecdotal reports of increasing wage pressures across a range of skill groups. However, given slow productivity growth, I expect wages to rise at a slower pace than in past expansions.

Inflation rates are near our 2 percent target. The recent decline in energy prices will temporarily weigh on headline inflation into 2019. Inflation expectations are fairly well-anchored, firms have reported some increase in their ability to raise prices for their customers, and the economy is expected to remain in a sound position. Thus, I expect inflation to remain near 2 percent through the forecast horizon.

With a somewhat slower growth trajectory and somewhat higher unemployment path compared to by previous SEP submission, I have revised down the fed funds rate path associated with my projections. This reduction in my path also takes on board the fact that the labor market tightness we have seen to-date has not translated into significantly higher inflation. My modal projection sees some further increases in the funds rate next year and only slightly tighter policy in 2020, with the rate moving down to slightly above my longer-run 3 percent estimate by the end of 2021. I view this path as prudently balancing the risks to the outlook for both parts of our mandate. However, as we near estimates of the neutral rate, with the uncertainties around that rate, and with the uncertainties around the forecast, I am well aware there is uncertainty around my policy path and I'll be attentive to the incoming data and what they imply about the medium run outlook and the risks. I note that the position of the economy at this point, with strong labor markets and inflation near 2 percent, gives us the opportunity to make this assessment and calibrate policy to achieve and maintain our dual mandate goals.

**Respondent 15:** My projection for the appropriate path of the federal funds rate over the next three years is slightly lower compared to my September forecast. In response to the continued lack of significant acceleration in inflation, even with tight labor markets, I have lowered my estimate of the longer-run funds rate by 25 basis points and have revised down my assessment of the degree to which monetary policy is accommodative. I now anticipate two rate hikes through the end of 2019 and one more in 2020.

**Respondent 16:** We assume that a funds rate in the 3 to 3-1/4 percent range would be restrictive enough to bring about a soft landing. And we continue to think it's appropriate to move policy into this position by the end of 2019. Accordingly, after a federal funds rate increase this round, we have three rate hikes in 2019 and thereafter hold the funds rate steady through 2021. We assume balance sheet normalization proceeds according to the announced plan and, like the Tealbook, we now assume a $1 trillion long-run level of reserves.

Our policy rationale is the same as it has been for some time. A very gradual pace of funds rate increases is necessary to firm inflation expectations symmetrically about 2 percent and ensure that inflation achieves our objective on a sustainable basis. But, eventually, policy will have to take a modestly restrictive stance to return output and the unemployment rate to their long-run normal rates in a measured fashion. We believe a funds rate at 3 to 3 1/4 percent – when compared with our 2 3/4 percent assumption for the long-run neutral rate – will achieve this goal. The recent changes in financial conditions have not altered our view that r* is currently slightly above its longer-run level but will move down as fiscal stimulus wanes. Our policy trajectory is consistent with some modest overshooting of our 2 percent inflation objective in 2020 and 2021, which we see as a virtue that will help to firm inflation expectations symmetrically around the 2 percent target.

**Respondent 17:** In my view, appropriate monetary policy calls for an attenuated removal of accommodation until we've achieved a neutral stance.

# Forecast Narratives

## Question 4(a). Please describe the key factors, potentially including your assumptions about changes to government policies, shaping your central economic outlook and the uncertainty and risks around that outlook.

**Respondent 1:** Core inflation is close to target and the economy continues to add jobs with only modest increases in wage growth. This reinforces my assessment that there may be some slack left in the economy.

**Respondent 2:** Fiscal policy is a key factor shaping my outlook, continuing to provide a boost to growth next year and, to a lesser extent, in 2020 as well.

**Respondent 3:** The recent data generally indicate that the economy remains strong, and I project that real GDP growth for this year will be about 3 percent, similar to my September projection. However, I assess that the economy has a little less momentum at this time and financial conditions are tighter than I had anticipated in September, so I project that growth in 2019 will be about 2 1/4 percent, compared to 2 1/2 percent in my September submission.

A number of factors contribute to this moderation of growth. First, the housing market has weakened more than I anticipated, and I have marked down my forecast for residential construction. Analysis by my sta has found that the combination of higher mortgage rates and smaller tax subsidies to housing from the TCJA have had a more significant effect on the housing market than anticipated and probably will continue to do so in 2019. These factors should also reduce home price appreciation, leading to somewhat lower household wealth. Second, I have dampened my projection for business investment because of the tightening of financial conditions and the decline in my projected path for oil prices. Third, the appreciation of the dollar and slightly slower global growth combine to lower U.S. aggregate demand modestly.

Even with this moderation, real GDP growth in 2019 will be at a pace above its potential rate. I thus expect the unemployment rate to fall to about 3 1/2 percent by the end of next year and core PCE inflation to reach 2 percent.

The basic contours of my projection over the rest of the forecast horizon are similar to those in my September projection. The combination of a gradually tighter monetary policy stance and the fading of fiscal stimulus leads to a slowdown of growth to just above potential in 2020 and modestly below potential in 2021. With slower growth, the unemployment rate begins to rise gradually, but it remains well below its longer-run normal rate at the end of 2021. With resource utilization remaining tight, inflation rises and is slightly above the FOMC objective in 2020 and 2021. A still-moderately tight monetary policy and little impetus from fiscal policy contribute to bring inflation, growth, and unemployment back to their longer-run normal levels by the middle of the next decade.

**Respondent 4:** The cost of credit - through higher Treasury yields, wider spreads, and 9 increases in the Fed funds rate - and "financial conditions = risk appetite" have tightened materially. Global growth outlook has been marked down. Treasury supply is exploding and we are shrinking our balance sheet . Term premia likely to rise and if they do't - it will be because global growth and risk appetite falls further. Dollar is stronger. Fed is not the only game in town.

**Respondent 5:** Our forecast continues to use a regime-based conception of outcomes for the US economy. In our conception, there are multiple regimes and we appear to have nearly converged to one of them. The current regime is viewed as persistent, and we see no reason to forecast a switch from the current regime over the forecast horizon. However, we are paying close attention to many factors, such as the effects of regulatory and tax policy changes, which might move the economy to a high productivity state. Monetary policy is regime-dependent and can be viewed as optimal given the current regime. Longer term, the economy may visit other regimes, such as ones associated with higher productivity growth, a higher return to short-term government debt, or recession. If the economy transitions to any of these states, all variable may be affected and, in particular, the optimal regime-dependent policy may require adjustment. However, predicting when these transitions may occur is challenging, so we forecast that the economy will remain in the current regime over the forecast horizon.

**Respondent 6:** I believe that fiscal stimulus temporarily boosted real GDP growth, but that boost is now wearing o . Strong consumer and business sentiment suggest that GDP growth will stay above trend for some time. However, the signals on sentiment are becoming more mixed.

**Respondent 7:** The economy continues to expand at a strong pace relative to trend, which has pushed the unemployment rate lower. My forecast factors in a sizable effect of the fiscal stimulus to the economic outlook. Ongoing strength in household disposable income coupled with past gains in household wealth and high consumer confidence should support continued consumption growth. The outlook for fixed business investment appears healthy given the corporate tax changes. However, uncertainty regarding possible further retaliatory tariffs from U.S. trading partners, the declining prospects for global growth, and the recent rise in financial market volatility may induce more cautious spending behavior. Furthermore, my contacts in the business community have recently shown a noticeable decline in optimism. These factors have caused me to slightly lower my estimate for real GDP growth in 2019.

Despite these recent developments, I expect the economic expansion to proceed at a pace that is above potential. With fiscal stimulus and likely some monetary accommodation still in place, I expect the output and unemployment gaps to overshoot for the next few years, leading to some pickup in inflation. I continue to expect core inflation to reach our 2 percent target on a sustained basis by 2019, followed by a slight overshooting that continues through 2021. Normalization of monetary policy and a tightening of fiscal policy will help bring inflation, growth, and unemployment back to their long-run sustainable levels in the following years.

**Respondent 8:** N/A

**Respondent 9:** In the background, the economic outlook continues to be shaped by adverse demographic trends, technology enabled disruption (which is increasing the need for improved education and skill levels), education and skill levels that are not keeping pace with business needs and are contributing to sluggish productivity growth, and the likely unsustainable path of U.S. government debt. Weak trend U.S. growth, weakening growth prospects abroad, and strong global demand for safe assets continue to hold down the equilibrium level of interest rates and the appropriate path for policy. Cyclical pressures on wage inflation are building, but appear more likely to squeeze margins than put upward pressure on price inflation. Brinksmanship in trade and other government policies, here and abroad, contributes to business uncertainty as well as uncertainty about the economic outlook, greatly complicates the conduct of monetary policy, and limits the practical usefulness of forward guidance on the path of short-term interest rates.

**Respondent 10:** Central economic outlook: My forecast for real GDP growth is characterized by above-trend growth from 2018 to 2020, where supportive financial conditions and expansionary fiscal policy are the main factors boosting growth temporarily above trend. Real GDP growth will likely decelerate as financial conditions become less accommodative and the effects of the fiscal stimulus wane. I expect PCE inflation to be modestly below 2 percent early in 2019, reflecting the recent drop in energy prices, but to return to 2 percent during the year.

Uncertainty and risks: I view uncertainty surrounding my projections as broadly similar to levels of uncertainty over the past 20 years, considering the magnitude of historical forecast errors and current economic and policy uncertainty at home and abroad. The risks to economic growth, unemployment, and inflation appear broadly balanced, although downside risks appear to have increased. Threats of more restrictive trade and immigration policies, signals of slowing global demand, and rising geopolitical uncertainty pose downside risk to economic growth and inflation. Upside risks to my forecast stem from greater-than-expected momentum in the economy and the possibility that deregulation and elevated business confidence translate into sustained increases in investment and productivity.

**Respondent 11:** I believe that the economy still has considerable underlying momentum, notwithstanding recent volatility in financial markets. Strong growth will push down the unemployment rate, but by a fairly modest amount as workers are drawn into the workforce, increasing labor force participation. The buffering effect of higher potential growth, both in response to policy changes as well as increased investment and labor force participation, will limit the spillover of growth into inflation.

**Respondent 12:** N/A

**Respondent 13:** Incoming data since the September projections have been a touch weaker than expected on net, although data on consumer spending has remained strong. Economic growth remains far enough above potential to have resulted in further declines in the unemployment rate if not for a continued cyclical rebound in labor force participation. Turbulence in the financial markets has yet to have a noticeable impact on consumer sentiment, but equity valuations are less supportive of growth going forward than they were in September. At the same time, the outlook for real household income has improved due to tight labor markets and falling oil prices. In addition, the outlook for residential investment has become more negative and net exports, which provided a boost to the economy earlier in the year, are now a drag on growth. Taken together, we believe the underlying momentum of the economy remains reasonably strong–helped in part by ongoing fiscal stimulus–and that growth will continue to outstrip potential in the second half of this year, but by a little less than we expected in September. Economic momentum carries forward into next year, but growth moderates as interest rates continue to increase. By 2020, growth falls a bit below potential and moves lower in 2021. As a result, the unemployment rate begins to rise, but remains nearly a percentage point below full employment by the end of 2021.

Our forecast is conditioned on further increases in the federal funds rate that result in a moderately restrictive stance of monetary policy by the end of the forecast horizon. The pace of tightening is very cautious relative to historical standards given that the unemployment rate is already well below its assumed equilibrium level. Our path for policy strikes a balance between the need to raise rates enough to prevent the unemployment rate from falling further below its equilibrium level, and the risk that raising rates too quickly may increase the likelihood that the economy falls into a recession. In striking this balance, we have revised down the level of the federal funds rate over the forecast horizon relative to our projection in September. Given a slightly weaker outlook for growth in those years, this lower policy path has the unemployment rate moving up slightly over the medium term while somewhat reducing the probability of higher rates pushing the economy toward a recession.

We view the risks around the GDP growth outlook as roughly balanced in the near term. It is possible that the recent financial market volatility and equity price declines will start weighing on consumer spending more than we currently anticipate. In addition, while our outlook accounts for the recently enacted tariffs, it assumes that any effects are relatively minor whereas in reality they could prove more disruptive to economic growth. At the same time, we maintain a fairly conservative view of the effects of the Tax Cuts and Jobs Act on GDP growth, and it is possible that the tax cuts will stimulate activity by an amount that is cumulatively larger than we have assumed. In the medium term, with the unemployment rate well below equilibrium, the ability to achieve a soft landing remains questionable. A scenario in which the economy eventually falls into a recession as monetary policy tries to move the unemployment rate back to equilibrium has historical precedents. The likelihood of such a situation increases if inflation suddenly reacts more forcefully than anticipated to the tight labor market conditions and policymakers respond by raising interest rates faster. In addition, the unemployment rate would decline more quickly if the ongoing and anticipated increase in payrolls does not continue to be met by cyclical increases in labor force participation. Finally, an unemployment rate below 4 percent for an extended period runs the risk of eliciting a nonlinear response in inflation, even if the equilibrium unemployment rate turns out to be below our current estimate.

**Respondent 14:** The U.S. economy remains in a healthy position, with output and employment growing above trend, the unemployment rate below estimates of its longer-run natural rate, and inflation near 2 percent. Nevertheless, sentiment about the global economic outlook has deteriorated, uncertainties over trade policy remain unresolved, financial market volatility has increased, stock prices have fallen, and corporate credit spreads have increased. One question is whether the moves in financial markets are signaling weaker underlying fundamentals. At this point, I have not changed my view that the fundamentals are healthy. Firms in the district reported a strong 2018 and are optimistic that 2019 will be healthy as well, although likely somewhat weaker than in 2018.

The consumer sector remains healthy. Wages are moving higher and, despite the drop in stock prices, household balance sheets remain healthy. With much of consumer debt at low fixed rates, the sector should be able to handle the anticipated interest rate increases, although mortgage originations are likely to decline.

The business sector remains sound, but the pace of investment has slowed, perhaps due to increased uncertainty around trade policy and the health of the global economy.

Labor market conditions are strong. Firms continue to report tightness in labor markets and difficulties in finding qualified workers. In response they have been increasing wages across a range of skill groups and occupations. The outlook for the global economy has weakened, but accommodative monetary policies are expected to be supportive of continued growth.

After running well above trend in 2018, I project growth will be slowing to trend over the forecast horizon and

that the labor market will remain strong, with the unemployment rate moving down somewhat further next year and remaining below its longer-run rate through 2021.

Inflation rates are near our 2 percent target. The recent decline in energy prices will temporarily weigh on headline inflation into 2019. But with inflation expectations fairly well-anchored, the economy remaining healthy, and a leveling out of energy prices, I expect underlying inflation to remain near 2 percent through the forecast horizon.

I view overall uncertainty as roughly comparable to the historical norms of the last 20 years. As described above, while there are a number of risks to my outlook, I view the risks as broadly balanced for both the real economy and for inflation, contingent on my policy rate path.

**Respondent 15:** My forecast calls for output growth to slow from 3 percent in 2018 to 2 percent in 2021 as fiscal stimulus wanes and the economy returns to trend. The unemployment rate stays below my estimate of the natural rate over the forecast horizon but I do not anticipate this will result in a significant building of inflation pressures due to a relatively flat Phillips curve. As well, the continuing lack of significant acceleration in inflation even with tight labor markets has led me to revise my view on how accommodative monetary policy is. My forecast calls for inflation to remain near the Committee's target with only modest increases in the funds rate going forward. I see more downside risk to the forecast compared to September in response to heightened asset market volatility, a flattening yield curve, and weaker growth prospects abroad. I remain concerned about uncertainty surrounding fiscal and trade policy going forward.

**Respondent 16:** We continue to see the fundamentals underlying private domestic demand as solid. Less accommodative monetary policy and a waning impulse from fiscal policy are expected to result in somewhat slower growth in 2019. Still, we see growth then running somewhat above potential. By 2020 and 2021, higher policy rates and a further decline in fiscal stimulus lowers growth below potential, and the output gap falls by almost a percentage point to 1.4 percent by the end of the forecast period. Slowing foreign growth and a stronger dollar also are expected to contribute to the slowdown.

We project the unemployment rate to move down to 3 1/2 percent in 2019 and then rise to 3.8 percent by the end of 2021, a 1/2 percentage point below our estimate of the natural rate of unemployment.

We expect that tight labor markets will provide a lift to inflation going forward, even with a flat Phillips curve. We also rely on a shallow path for policy normalization and a strongly communicated commitment to a symmetric 2 percent inflation target to firm inflation expectations around 2 percent. A non-accelerationist Phillips curve limits the upside risk to inflation, even with the unemployment rate at 3 1/2 percent. All told, we expect core inflation to be 2.0 percent next year, then to rise gradually to 2.2 percent by 2021.

The key factors shaping uncertainty and the risks to the forecasts were discussed earlier in the risks and uncertainty sections.

**Respondent 17:** Real GDP, in my outlook, steps down from the strong growth we've seen this year, but still grows at an above trend pace next year before settling down to trend by the end of 2020. A stronger profile to consumer spending, owing largely to the recent tax reform, is the primary driver of the moderate overshoot of potential growth.

The risks to my growth outlook are balanced. Household spending could, again, surprise to the upside given solid balance sheets and favorable sentiment levels. However, the recent bout of financial volatility may induce more pessimistic attitudes among households and lead to a growing sense of caution from firms, forestalling further capital expansion and slowing hiring.

Measured inflation appears to be running at or slightly below target. Given the absence of slack in my projection, I see inflation continuing at or very near the FOMC's inflation objective through 2021.

The risks to my inflation outlook are balanced. Given high rates of resource utilization, we could see a more pronounced inflation response than a linear Phillips curve would suggest. Also, additional tariffs could increase the pressure on firms' costs and consumer prices, leading to higher inflation expectations.

However, to date, inflation has remained quiescent despite the strong profile of growth this year and amid what appear to be tightening labor market conditions. This may be a signal that inflation expectations are very well anchored at mandate-consistent levels. Another possibility is that alternative sources of slack that are not a part of my baseline view, such as global resource utilization, are having and will have a greater impact on domestic inflation than I currently anticipate.

# Forecast Narratives (continued)

## Question 4(b). Please describe the key factors, potentially including revisions to your assumptions about changes to government policies, causing your forecasts to change since the previous SEP.

**Respondent 1:** Incoming data, especially the recent slide in oil prices caused me to mark down my inflation forecast. Otherwise, my forecasts are little changed.

**Respondent 2:** GDP growth this year and next is slightly weaker than in my September projection, reflecting incoming data and the effects of somewhat tighter financial conditions.

One key government policy change is an upward revision to the terminal level of the balance sheet: At the time of September SEP, I had assumed that reserves would stabilize around $500 billion, as in the sta baseline assumption. This round, I have raised my estimate of the longer-run level of reserves, along the lines of the upward revision in the sta projection. Other things equal, this larger balance sheet tends to push up my federal funds rate path, helping to offset some of the downward revision to the funds-rate path that the tightening in financial conditions would otherwise suggest.

**Respondent 3:** While most data since September have been in accord with my economic outlook at that time, there were a few developments that have led to some changes in my projections. As noted in my response to question 4(a), weak housing data, tightening financial conditions, dollar appreciation and a softer global growth outlook have led me to reduce modestly the real GDP growth projection for 2019. The lower growth projection also is associated with a slightly higher unemployment projection for that year.

In addition, the inflation data since September were on the softer side, which has been a feature of the U.S. economy through most of this expansion. My sta has analyzed these developments through the lens of several statistical models and found that the preponderance of evidence points to underlying inflation running modestly below 2 percent through this period. Taking this on board, I have lowered the profile of my inflation projections, resulting in a smaller overshoot of inflation in 2020 – 21 than I had projected in September.

Another consequence of my assessment of lower underlying inflation and weaker growth in 2019 is that my path for the policy rate is shallower than it was in my September submission. This shallower path is necessary in my opinion to achieve the dual mandate on a sustainable basis in the current environment.

**Respondent 4:** N/A

**Respondent 5:** Recent data for the US and world economies have led us to decrease our projections for GDP growth for 2019 and 2020.

**Respondent 6:** We have slightly lowered our inflation forecasts in response to recent monthly inflation readings.

**Respondent 7:** My forecast has changed little from the previous projection with only a slightly lower estimate for growth and inflation in 2019.

**Respondent 8:** N/A

**Respondent 9:** I've lowered my projections for GDP growth in response to my concerns regarding deterioration in financial conditions, deterioration in global growth prospects, deteriorating corporate earnings guidance, and the rise in overall business uncertainty. Political-economy risks continue and are contributing to elevated uncertainty which is likely to spill over to the real economy. I've also revised my near-term inflation projections downward in response to potential hints of weakness in our core measures as well as lower prospective energy prices. With a more uncertain and somewhat weaker growth outlook, my funds-rate path is shallower than before–25 b.p. lower in both 2019 and 2020. Given tame inflation and hints of an earlier-than-previously-expected deceleration in real activity, we need to be more patient in assessing the impact of past rate increases and waning fiscal stimulus, and should be disciplined enough to allow time for these uncertainties to resolve themselves—–for better or for worse.

**Respondent 10:** I have revised down my projection for the appropriate path of the federal funds rate. The expansionary fiscal policy enacted late last year in an economy operating at or above full capacity increased upside risk to growth and inflation. However, inflation has remained stable this year, suggesting this upside risk is unlikely to materialize. At the same time, downward revisions to the global growth outlook this year have intensified disinflationary pressures. With these developments, I view a more patient approach to monetary policy normalization as appropriate, as it will allow collecting more evidence that inflation remains stable and unemployment remains near its longer-run level.

**Respondent 11:** My outlook is little changed. I have revised down my outlook for the unemployment rate a touch in response to the recent data. I have also nudged down my inflation outlook in 2018 and 2019, mostly on account of lower oil prices.

**Respondent 12:** N/A

**Respondent 13:** We believe that appropriate policy should aim for at least a modest uptick in the unemployment rate by the end of the SEP forecast horizon, and we set the interest rate path accordingly. Because we see underlying economic growth as somewhat weaker than in our previous SEP submission, the path for interest rates that accomplishes these outcomes is a bit lower than it was in our previous submission. Still, by late 2021, the lower rate path does not fully offset weaker underlying growth, and as a result the unemployment rate ends the forecast horizon a bit higher than in our September outlook.

**Respondent 14:** The U.S. economy remains in a healthy position, with output and employment growing above trend, the unemployment rate below estimates of its longer-run natural rate, and inflation near 2 percent. Nevertheless, sentiment about the global economic outlook has deteriorated, uncertainties over trade policy remain unresolved, financial market volatility has increased, stock prices have fallen, and corporate credit spreads have increased. Incoming data, including weak investment spending, have led me to revise down my path for GDP growth somewhat and to edge up my path of the unemployment rate; there has been little change in my inflation projection.

With a somewhat slower growth trajectory and somewhat higher unemployment path compared to by previous SEP submission, I have revised down the fed funds rate path associated with my projections. This reduction in my path also takes on board the fact that the labor market tightness we have seen to-date has not translated into significantly higher inflation.

**Respondent 15:** My forecast is largely unchanged since September though I have lowered slightly my estimate of the longer run federal funds rate.

**Respondent 16:** A touch weaker-than-expected incoming data led us to reduce our GDP growth forecast by a tenth in 2018 and 2019, but the remainder of the GDP forecast is unchanged. With no change to our estimates of potential output, our output gap is 0.2 percentage point smaller at the end of 2021 relative to September. Consistent with this small downward adjustment to GDP, we raised our unemployment rate projection by 0.1 percentage point in 2019-2021.

As a consequence of the softer core PCE data, we lowered our forecast for core inflation by 0.1 percentage point in 2018-2020.

**Respondent 17:** The real-side economic data have largely evolved in line with my prior expectations. However, energy prices have declined precipitously and inflation has been, on balance, a touch softer than I had projected for the second half of the year. In response, I have lowered my inflation projections modestly through 2020.

# Forecast Narratives (continued)

## Question 4(c). Please describe any important differences, potentially including those related to your assumptions about changes to government policies, between your current economic forecast and the Tealbook.

**Respondent 1:** Relative to the Tealbook, my forecasts for economic activity and inflation are a touch stronger. I believe the long-run unemployment rate is lower and the improving labor market will continue to keep the labor force participation rate from falling, minimizing the downward effects of healthy job growth on the unemployment rate. I believe that it is appropriate for the federal funds rate to rise more gradually than in the Tealbook. Even with lower rates, my projection anticipates that inflation will be just barely above the Tealbook.

**Respondent 2:** N/A

**Respondent 3:** My set of projections is broadly in alignment with the Tealbook forecast. One notable exception is the anticipated path of the federal funds rate.

In both forecasts, the fading of fiscal stimulus and the removal of monetary policy accommodation slow real growth to near its potential rate in 2020 and below potential in 2021. The prolonged period of tight resource constraints eventually results in inflation slightly overshooting the 2 percent objective: This overshoot occurs somewhat earlier in my projection (2020) than it does in the Tealbook projection (2022, based on the longer-term projection). The Tealbook projects a somewhat larger and more prolonged undershooting of the unemployment rate from its longer-run normal rate, with a trough of the unemployment rate at 3.4 percent in 2019 – 20, compared to the trough of 3.5 percent for those years in my projection. Although the policy rate paths in both projections have shifted downward since September, my path has shifted more than the Tealbook path, leading to a somewhat wider discrepancy between the two paths.

**Respondent 4:** frb/us and EDO forecast (sans judgement) on page 92 of Teal book are in the zone of reasonableness to me.

**Respondent 5:** For GDP growth, especially through 2020, and inflation, our projections are similar to those in the Tealbook. Differences arise with respect to monetary policy implications because the Tealbook projections incorporate the idea of a longer-run steady state to which the economy is converging. Monetary policy has to be set appropriately as the economy transitions to the longer-run steady state. This tends to imply an upward-sloping policy rate path. Our regime conception, in contrast, views monetary policy as regime-dependent and the current regime is viewed as persistent. We acknowledge that the economy may visit other regimes in the future, but switches to these regimes are difficult to forecast. This suggest a flat path for the policy rate over the forecast horizon relative to that contained in the Tealbook. Before returning to its longer-run value of 4.6 percent, the Tealbook also has a substantial undershooting of the unemployment, far more than our undershooting. The Tealbook also has an undershooting of GDP growth in 2021 that we do not project.

**Respondent 6:** As usual, the Tealbook path for the funds rate seems implausible, given the paths for output, employment, and inflation. Otherwise, our forecasts are similar.

**Respondent 7:** The two projections are largely in alignment, with the exception of the anticipated path for the federal funds rate.

In both, the waning effects of the fiscal stimulus and the gradual removal of monetary policy accommodation slow growth closer to potential by 2020. Still, in my projection, the unemployment rate bottoms out at 3.4 percent by the end of 2019 and then begins to increase in late 2020. By contrast, the Tealbook projects that the unemployment rate remains at 3.4 percent until the third quarter of 2021. The persistent overshooting of full employment results—in my forecast—in inflation slightly above 2-percent for several years. My projection for the funds rate path shows a more gradual rise that tops out to a much lower level relative to the funds rate path in the Tealbook.

**Respondent 8:** N/A

**Respondent 9:** Relative to the Tealbook baseline, my projections for GDP growth and the unemployment rate are slightly tilted toward the FRB/US model forecasts. Contributing factors are my belief that the stimulus to growth from fiscal policy will fade faster than is assumed in the Tealbook baseline, and the relatively greater weight that I attach to the impact of global growth decelerating, corporate profit growth decelerating, trade tensions impacting companies fairly extensively, widespread commodity price weakness potentially foreshadowing economic slowing, yield curve flattening, corporate credit spreads widening, and an overall rise in business uncertainty. Many of these uncertainties haven't yet shown up in the hard economic data: Waiting for these issues to translate into concrete evidence of slowing may put the Fed well behind the curve and reduce our operating flexibility. We are now in a late-cycle economy, and that fact should be reflected in our risk-management calculus.

**Respondent 10:** My assumptions and projections for real GDP growth, unemployment, and inflation are similar to those in Tealbook. My projected path for the federal funds rate is lower than in Tealbook.

**Respondent 11:** I have a stronger outlook for potential growth than the Tealbook. Consequently, I believe that the economy can grow faster than projected in the Tealbook without much additional upward impetus to price inflation. My more optimistic outlook for potential growth is consistent with a slightly higher long-run neutral interest rate compared to that in the Sta outlook.

**Respondent 12:** N/A

**Respondent 13:** Real outcomes are qualitatively similar in the two forecasts. We expect inflation to increase somewhat more meaningfully above 2 percent than the Tealbook in large part because long-run inflation expectations in our model are anchored at 2.0 percent rather than 1.8 percent. In both forecasts monetary policy needs to tighten noticeably more than what financial markets are currently expecting for the unemployment rate to start moving up toward its equilibrium level. However, the path for the federal funds rate in the Tealbook is noticeably higher than in our forecast—a difference that is due, at least in part, to the Tealbook's more favorable assessment of the underlying strength in the economy. Our outlook also takes some signal from the empirical evidence suggesting that monetary policy tightening has a larger effect on economic activity than monetary easing of the same magnitude.

**Respondent 14:** As in the Tealbook forecast, I expect that over the forecast horizon growth will slow from an above-trend pace to trend, labor market conditions will remain strong, and underlying inflation will remain near our 2 percent goal. Although the outcomes in the Tealbook forecast are similar to those in my forecast, to achieve these outcomes, the Tealbook's policy path is steeper throughout the forecast horizon than my path. By the end of the forecast horizon, the Tealbook's fed funds rate projection is about 125 basis points steeper than mine. Thus, the Tealbook sees a stronger underlying economy that needs to be tempered by more restrictive monetary policy and/or different inflation dynamics compared with my projection.

**Respondent 15:** My anticipated path for the funds rate under appropriate monetary policy is significantly lower than the Tealbook baseline.

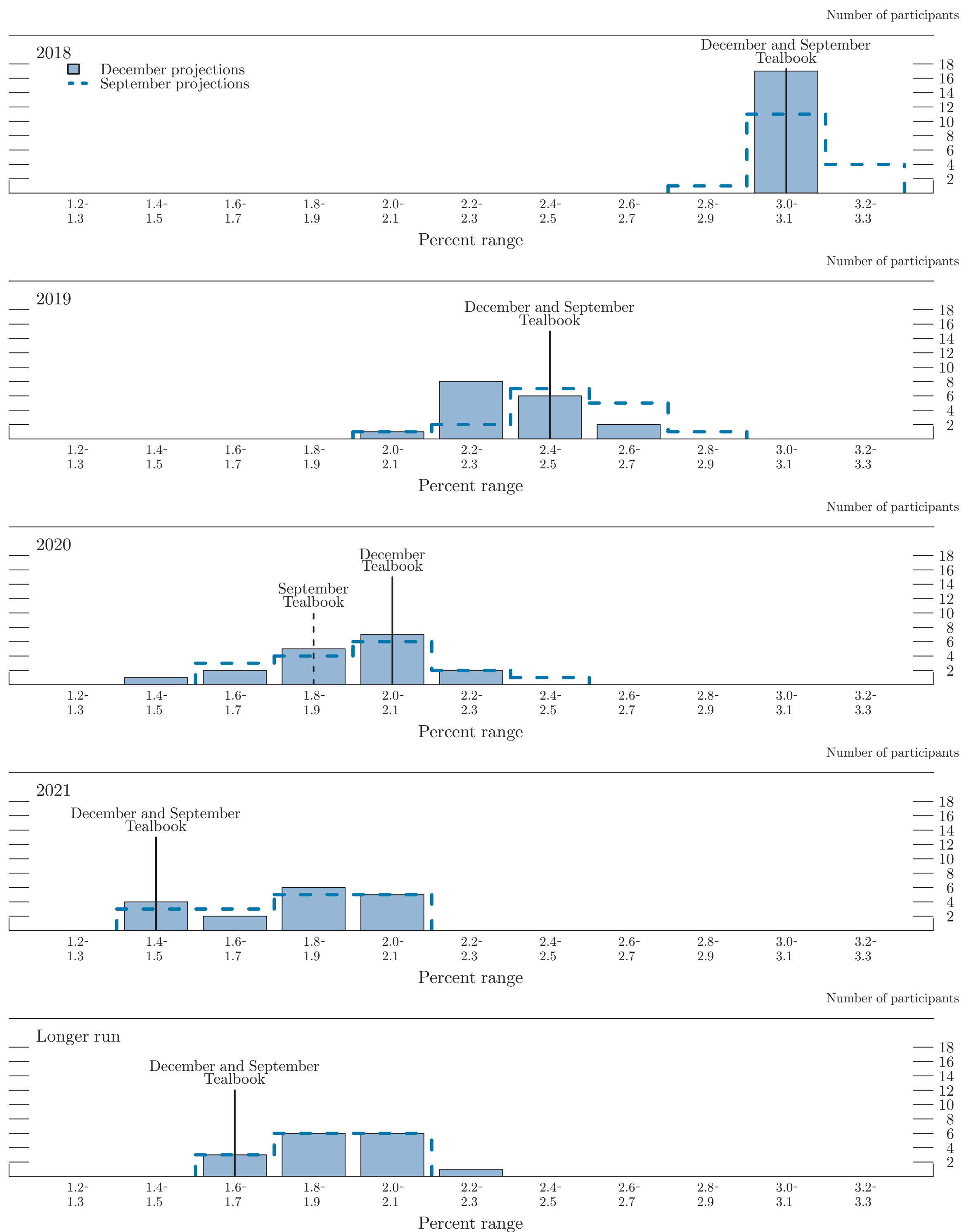
**Respondent 16:** Our federal funds rate path is noticeably below the Tealbook throughout the forecast period, ending 2021 in the 3 to 3 1/4 percent range. We assess the long-run neutral funds rate to be 2.75 percent, a bit higher than the Tealbook, and therefore do not overshoot the long-run neutral fed funds rate by nearly as much. In contrast to the Tealbook, we assume the recent financial market developments are a slight negative for the forecast. Over the 2018-2020 period, we assume roughly the same average impulses from tax cuts and government spending as the Tealbook; however, we assume fiscal policy will be a slight negative for growth in 2021. Our view of potential output growth through 2021 is somewhat stronger than the Tealbook's, largely reflecting more BFI and capital deepening.

Our projection for actual GDP growth is very similar to the Tealbook throughout the projection period. Given our stronger potential, in 2020 and 2021 our output gap is about 1 percentage point smaller. Our projection for the unemployment rate is similar to the Tealbook's in 2018 and 2019, but we expect the rate to begin to rise in 2020, a bit sooner than the Tealbook. Combined with a lower estimate of the natural rate (4.3 percent), this leaves our unemployment rate gap at the end of 2021 at about 0.5 percentage point, half the estimate in the Tealbook.

Our forecast for core inflation is 0.1 and 0.2 percentage point higher than the Tealbook in 2020 and 2021, respectively. Our boost from resource pressure is a not quite as large, but we condition on a more accommodative monetary policy path, which should lift underlying inflation trends and expectations more than in the Tealbook.

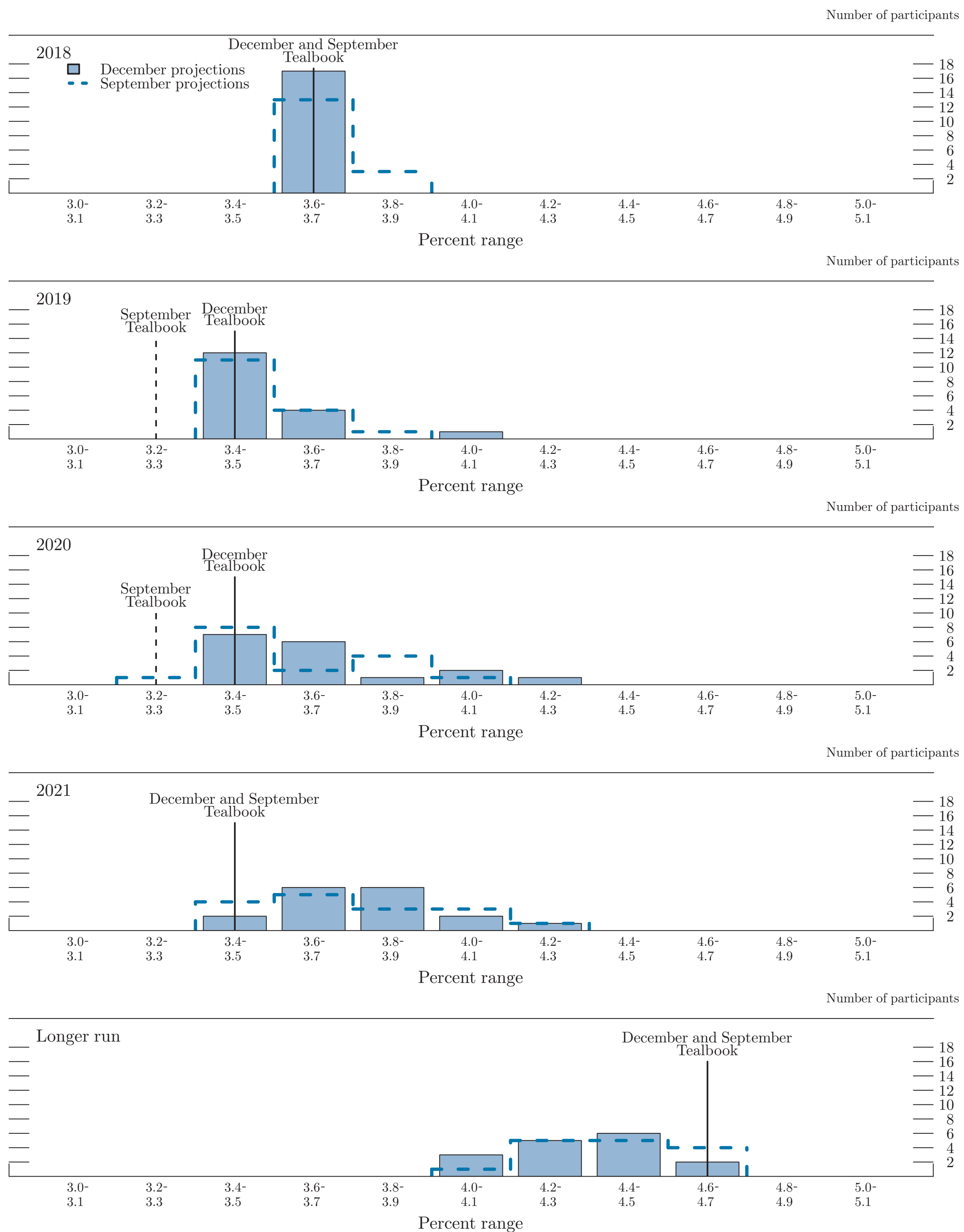
**Respondent 17:** My projection and that of the Tealbook share a qualitatively (if not quantitatively) similar arc. That said, my projection has slightly slower growth over the next two years relative to the Tealbook baseline owing largely to the modestly smaller impact from tax reform on overall growth that I am expecting. The divergence between my path for the unemployment rate and the projection marked into the Tealbook is due to differences in our employment growth projections over the next several years.

Figure 3.A. Distribution of participants' projections for the change in real GDP, 2018–21 and over the longer run



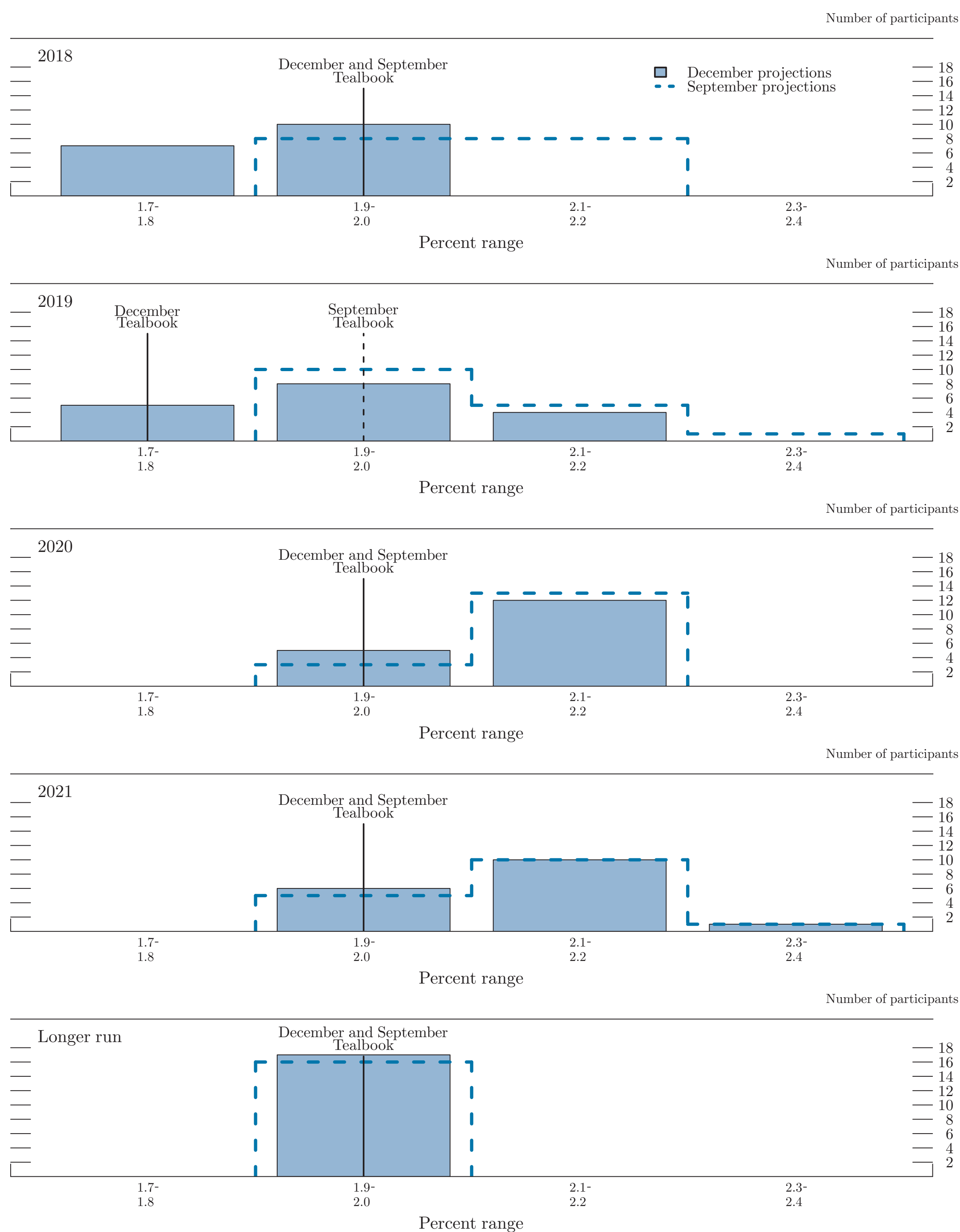

NOTE: Updated December Tealbook values are reported. Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2018–21 and over the longer run



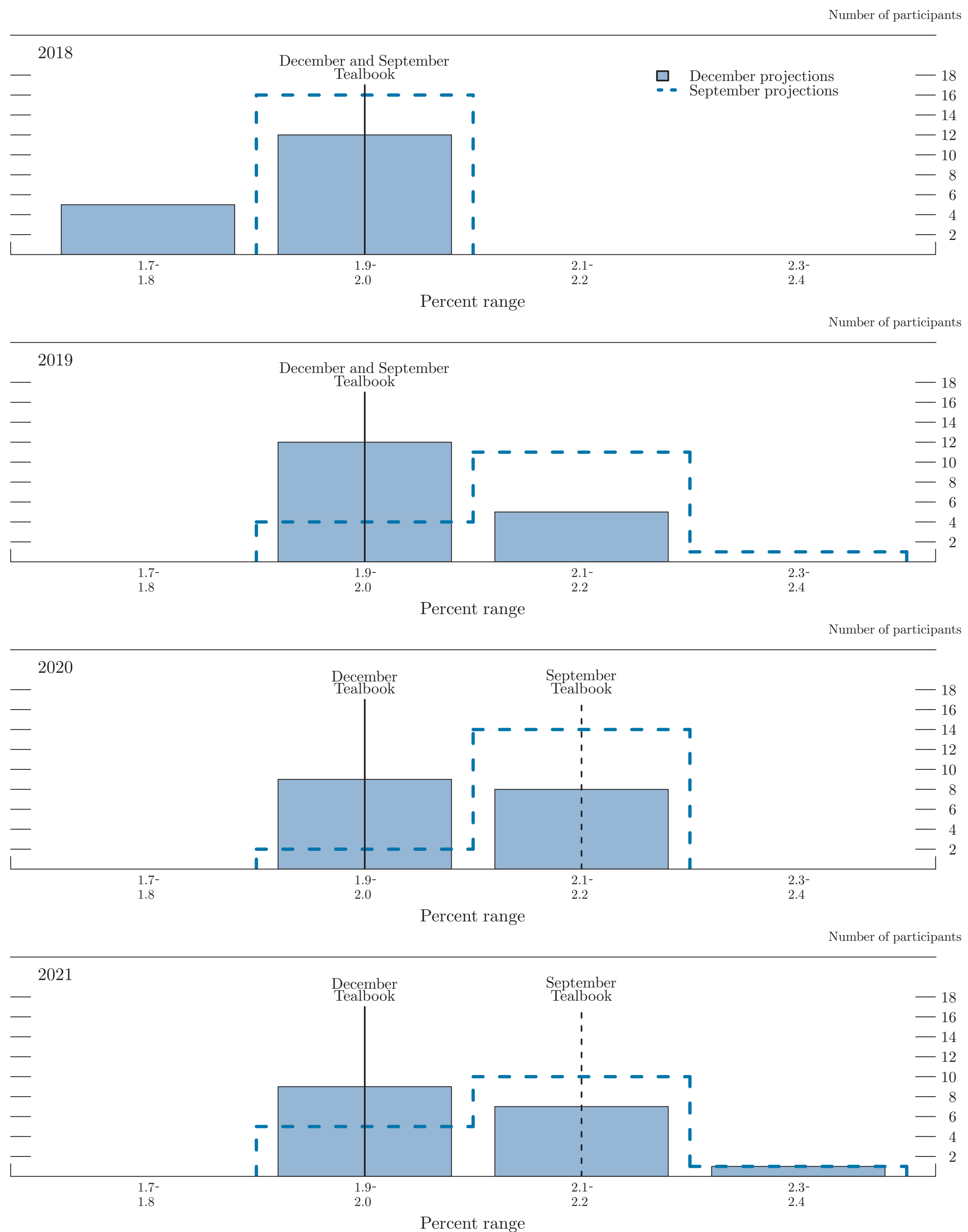

NOTE: Updated December Tealbook values are reported. Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2018–21 and over the longer run



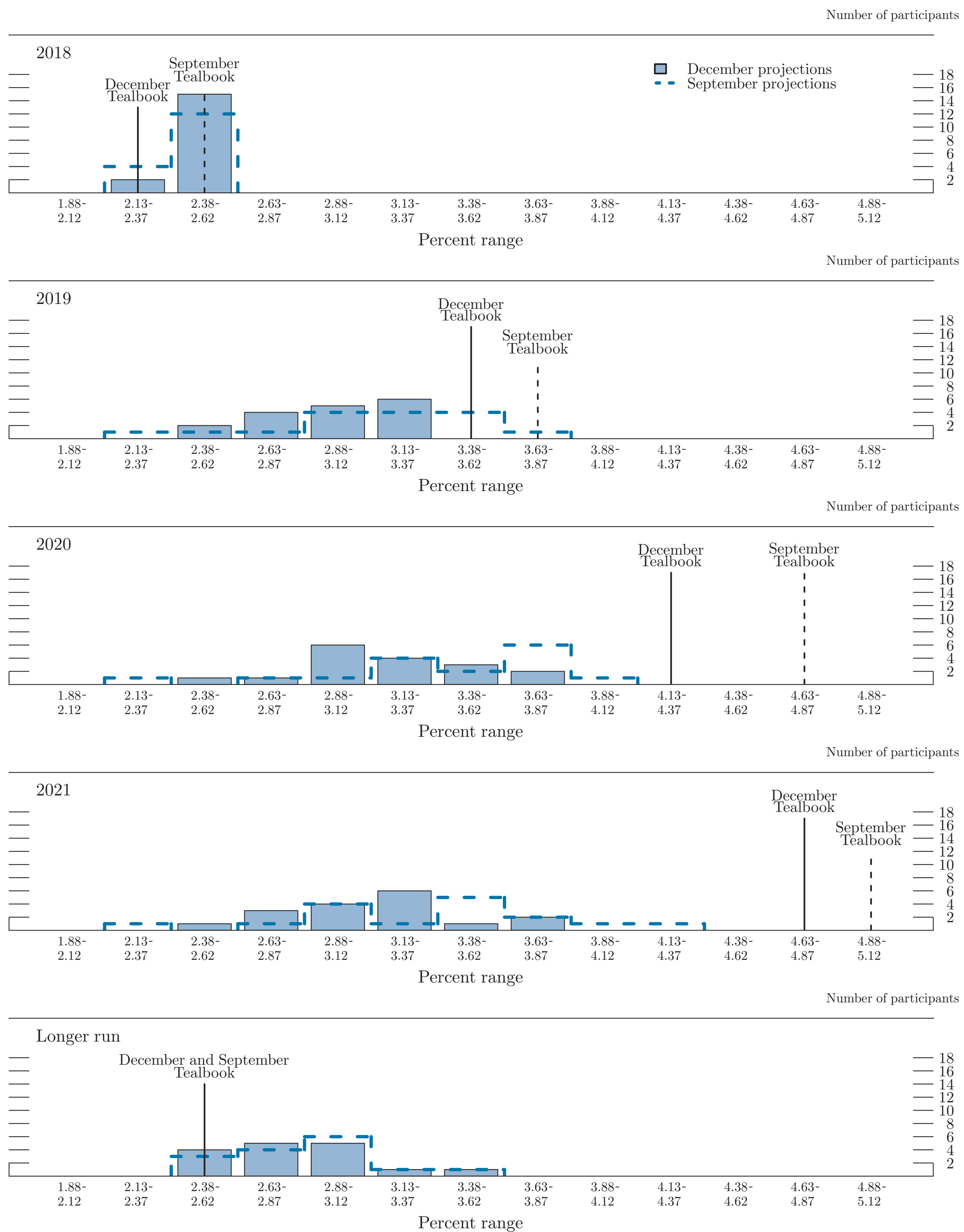

NOTE: Updated December Tealbook values are reported. Definitions of variables and other explanations are in the notes to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2018–21




NOTE: Updated December Tealbook values are reported. Definitions of variables and other explanations are in the notes to table 1.

Figure 3.E. Distribution of participants' judgments of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate, 2018–21 and over the longer run




NOTE: Updated December Tealbook values are reported. Definitions of variables and other explanations are in the notes to table 1.