Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy, June 2020

Percent

Variable	Median[1]				Central Tendency[2]				Range[3]			
	2020	2021	2022	Longer run	2020	2021	2022	Longer run	2020	2021	2022	Longer run
Change in real GDP	-6.5	5.0	3.5	1.8	-7.6–-5.5	4.5–6.0	3.0–4.5	1.7–2.0	-10.0–-4.2	-1.0–7.0	2.0–6.0	1.6–2.2
December projection	2.0	1.9	1.8	1.9	2.0–2.2	1.8–2.0	1.8–2.0	1.8–2.0	1.8–2.3	1.7–2.2	1.5–2.2	1.7–2.2
Unemployment rate	9.3	6.5	5.5	4.1	9.0–10.0	5.9–7.5	4.8–6.1	4.0–4.3	7.0–14.0	4.5–12.0	4.0–8.0	3.5–4.7
December projection	3.5	3.6	3.7	4.1	3.5–3.7	3.5–3.9	3.5–4.0	3.9–4.3	3.3–3.8	3.3–4.0	3.3–4.1	3.5–4.5
PCE inflation	0.8	1.6	1.7	2.0	0.6–1.0	1.4–1.7	1.6–1.8	2.0	0.5–1.2	1.1–2.0	1.4–2.2	2.0
December projection	1.9	2.0	2.0	2.0	1.8–1.9	2.0–2.1	2.0–2.2	2.0	1.7–2.1	1.8–2.3	1.8–2.2	2.0
Core PCE inflation[4]	1.0	1.5	1.7		0.9–1.1	1.4–1.7	1.6–1.8		0.7–1.3	1.2–2.0	1.2–2.2	
December projection	1.9	2.0	2.0		1.9–2.0	2.0–2.1	2.0–2.2		1.7–2.1	1.8–2.3	1.8–2.2	
Memo: Projected appropriate policy path												
Federal funds rate	0.1	0.1	0.1	2.5	0.1	0.1	0.1	2.3–2.5	0.1	0.1	0.1–1.1	2.0–3.0
December projection	1.6	1.9	2.1	2.5	1.6–1.9	1.6–2.1	1.9–2.6	2.4–2.8	1.6–1.9	1.6–2.4	1.6–2.9	2.0–3.3

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 December projections were made in conjunction with the meeting of the Federal Open Market Committee on December 10–11, 2019. 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 December 10–11, 2019, meeting, and one participant did not submit such projections in conjunction with the June 9–10, 2020, meeting. No projections were submitted in conjunction with the March 2020 FOMC 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 2020* (in percent)

Medians, central tendencies, and ranges

	Median	Central tendency	Range
Change in real GDP	-21.4	-22.3 to -20.0	-26.0 to -18.5
PCE inflation	-0.2	-0.3 to -0.1	-0.5 to 1.0
Core PCE inflation	0.3	0.3 to 0.4	0.2 to 1.0

Participants' Projections

Projection	Change in real GDP	PCE inflation	Core PCE Inflation
1	-21.4	-0.5	0.3
2	-18.5	-0.5	0.4
3	-21.4	-0.2	0.3
4	-20.0	1.0	1.0
5	-26.0	0.0	0.3
6	-22.3	-0.2	0.5
7	-20.0	-0.3	0.3
8	-23.0	-0.2	0.3
9	-20.0	-0.1	0.4
10	-21.4	-0.2	0.3
11	-21.5	-0.2	0.3
12	-22.0	-0.2	0.2
13	-21.4	-0.2	0.3
14	-21.1	-0.3	0.3
15	-25.1	-0.2	0.3
16	-21.1	-0.3	0.4
17	-20.0	1.0	1.0

*Growth and inflation are reported at annualized rates.

Table 1.B. Economic Projections for the second half of 2020* (in percent)

Medians, central tendencies, and ranges

	Median	Central tendency	Range
Change in real GDP	11.2	9.5 to 13.7	3.1 to 16.3
PCE inflation	1.7	1.4 to 2.0	0.6 to 2.7
Core PCE inflation	1.7	1.4 to 1.9	0.9 to 2.3

Participants' Projections

Projection	Change in real GDP	PCE inflation	Core PCE Inflation
1	12.4	2.5	1.7
2	9.6	1.5	1.4
3	9.6	2.2	1.9
4	14.2	0.6	1.4
5	14.1	1.6	1.7
6	13.7	1.4	0.9
7	10.5	1.7	2.3
8	12.3	1.8	1.7
9	8.1	1.7	1.6
10	3.1	1.2	1.9
11	10.2	1.6	1.7
12	9.5	1.8	1.6
13	11.2	2.0	1.9
14	16.3	2.7	1.5
15	9.3	1.8	1.9
16	13.2	1.5	1.6
17	12.8	1.0	1.2

*Projections for the second half of 2020 implied by participants' June projections for the first half of 2020 and for 2020 as a whole. Growth and inflation are reported at annualized rates.

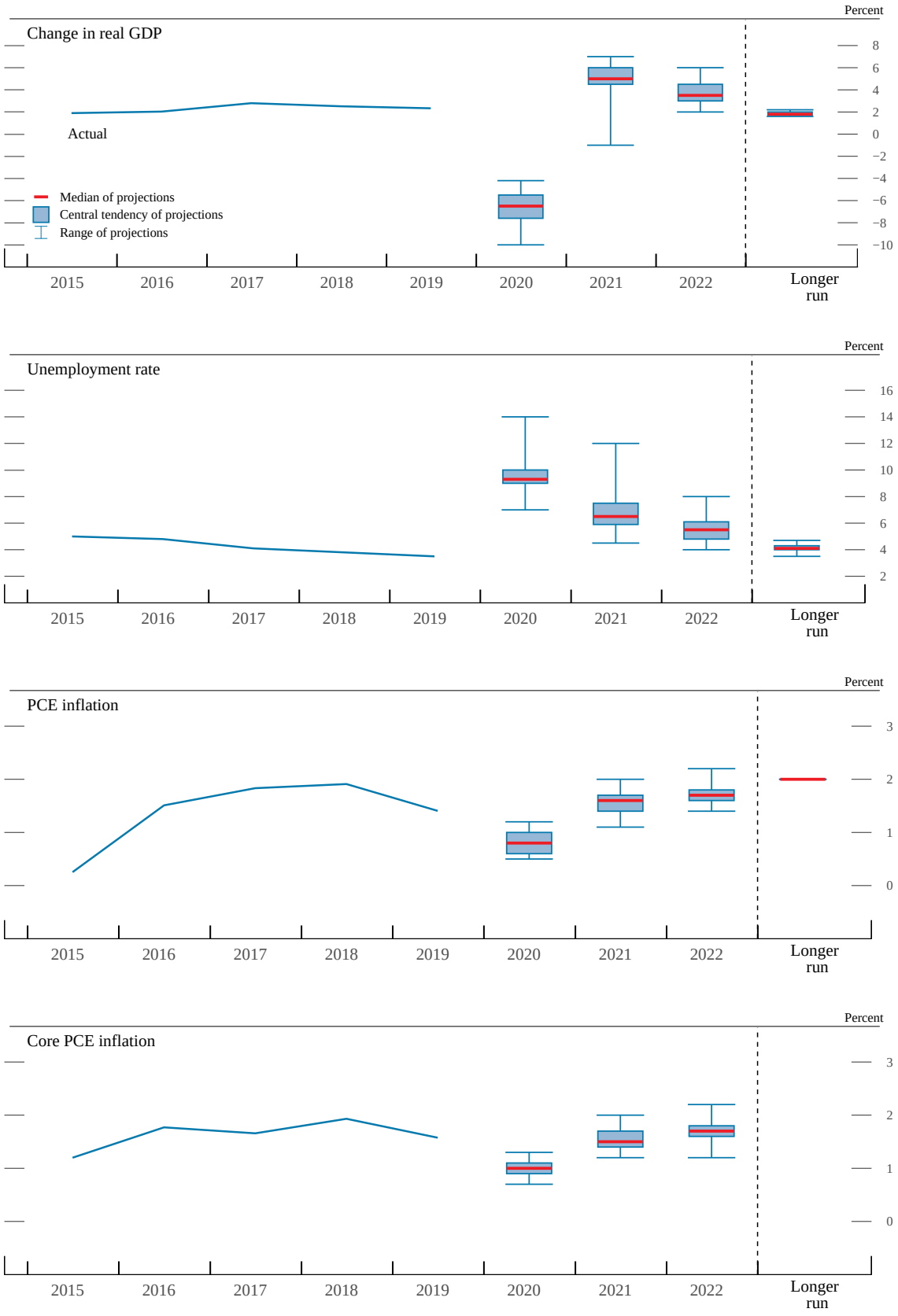
Table 2. June economic projections, 2020–22 and over the longer run (in percent)

Projection	Year	Change in real GDP	Unemployment rate	PCE inflation	Core PCE Inflation	Federal funds rate
1	2020	-6.0	9.1	1.0	1.0	0.13
2	2020	-5.5	10.0	0.5	0.9	0.13
3	2020	-7.2	9.3	1.0	1.1	0.13
4	2020	-4.4	8.8	0.8	1.2	0.13
5	2020	-8.1	9.1	0.8	1.0	0.13
6	2020	-6.0	9.3	0.6	0.7	0.13
7	2020	-6.0	9.0	0.7	1.3	0.13
8	2020	-7.0	9.0	0.8	1.0	0.13
9	2020	-7.0	9.5	0.8	1.0	0.13
10	2020	-10.0	14.0	0.5	1.1	0.13
11	2020	-7.0	9.0	0.7	1.0	0.13
12	2020	-7.6	9.4	0.8	0.9	0.13
13	2020	-6.5	9.0	0.9	1.1	0.13
14	2020	-4.2	9.6	1.2	0.9	0.13
15	2020	-9.5	11.0	0.8	1.1	0.13
16	2020	-5.5	10.0	0.6	1.0	0.13
17	2020	-5.0	7.0	1.0	1.1	0.13
1	2021	5.0	5.5	2.0	2.0	0.13
2	2021	6.0	6.5	1.5	1.5	0.13
3	2021	6.3	5.9	1.7	1.7	0.13
4	2021	4.6	5.5	1.6	1.6	0.13
5	2021	7.0	6.1	1.9	1.9	0.13
6	2021	5.0	7.2	1.7	1.6	0.13
7	2021	5.0	6.0	1.9	1.5	0.13
8	2021	5.0	7.5	1.3	1.3	0.13
9	2021	4.5	6.5	1.4	1.4	0.13
10	2021	-1.0	12.0	1.1	1.2	0.13
11	2021	6.5	6.5	1.5	1.5	0.13
12	2021	5.7	7.4	1.4	1.4	0.13
13	2021	4.5	6.6	1.6	1.5	0.13
14	2021	4.3	6.9	1.6	1.4	0.13
15	2021	5.5	9.0	1.6	1.6	0.13
16	2021	4.7	7.5	1.6	1.6	0.13
17	2021	5.0	4.5	1.7	1.8	0.13

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

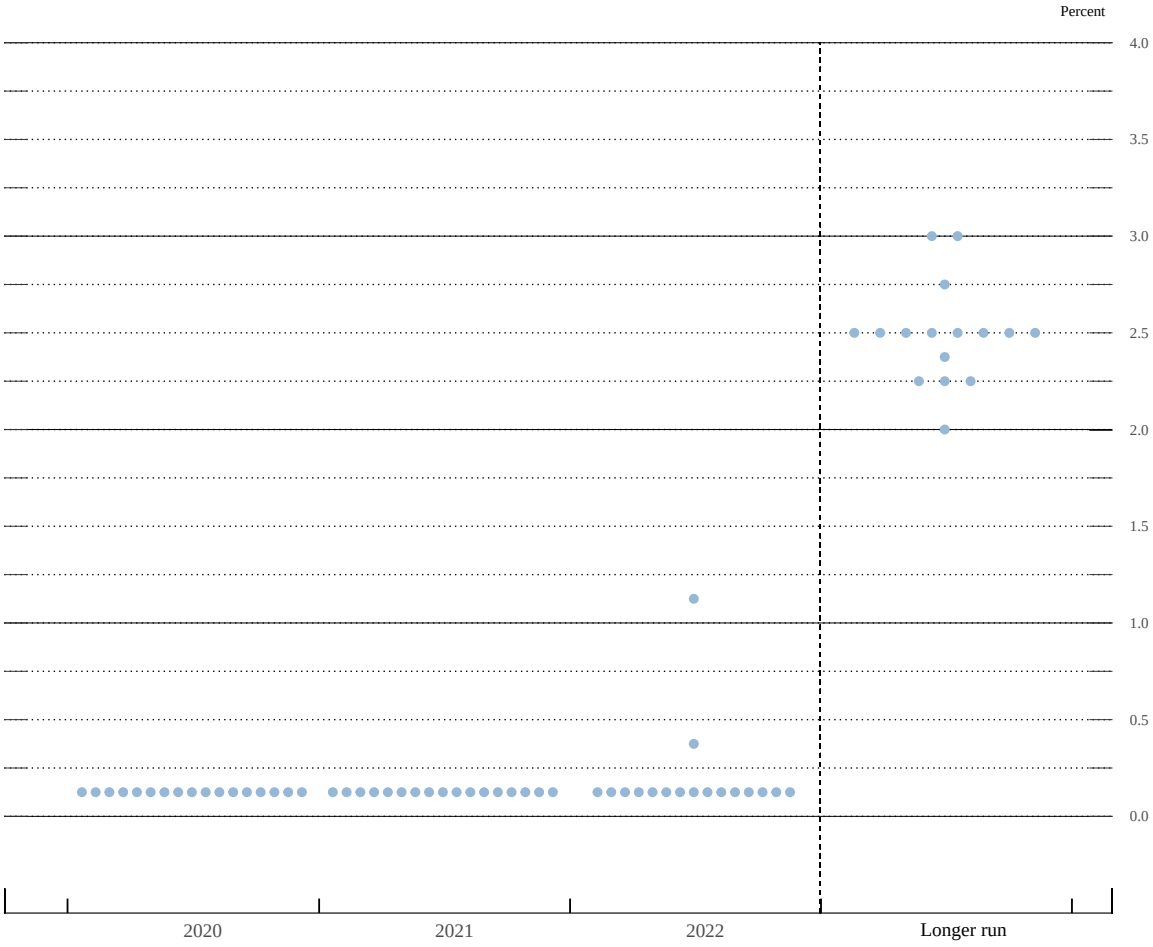
Projection	Year	Change in real GDP	Unemployment rate	PCE inflation	Core PCE Inflation	Federal funds rate
1	2022	2.0	4.3	2.0	2.0	1.13
2	2022	3.5	4.8	1.8	1.8	0.13
3	2022	3.8	4.5	1.8	1.8	0.38
4	2022	3.0	4.8	1.7	1.8	0.13
5	2022	5.0	5.1	2.2	2.2	0.13
6	2022	4.0	6.1	1.7	1.7	0.13
7	2022	2.5	5.0	1.7	1.7	0.13
8	2022	3.0	6.0	1.5	1.5	0.13
9	2022	4.0	5.5	1.7	1.6	0.13
10	2022	6.0	8.0	1.4	1.2	0.13
11	2022	5.0	5.0	1.6	1.6	0.13
12	2022	3.2	6.3	1.6	1.6	0.13
13	2022	3.0	5.5	1.7	1.6	0.13
14	2022	2.5	6.0	1.6	1.5	0.13
15	2022	4.5	6.0	1.7	1.7	0.13
16	2022	3.0	6.1	1.8	1.8	0.13
17	2022	3.5	4.0	1.9	1.9	0.13
1	LR			2.0		
2	LR	1.9	4.0	2.0		2.38
3	LR	2.0	4.0	2.0		3.00
4	LR	2.0	4.0	2.0		2.50
5	LR	1.6	4.3	2.0		3.00
6	LR	1.8	4.4	2.0		2.50
7	LR	2.0	4.3	2.0		2.75
8	LR	1.9	4.5	2.0		2.50
9	LR	1.8	4.2	2.0		2.50
10	LR	1.7	3.5	2.0		2.00
11	LR	2.0	4.0	2.0		2.25
12	LR	1.7	3.8	2.0		2.30
13	LR	1.8	4.3	2.0		2.50
14	LR	1.8	4.3	2.0		2.25
15	LR	1.7	4.7	2.0		2.50
16	LR	1.8	3.8	2.0		2.50
17	LR	2.2	4.0	2.0		2.50

Figure 1. Medians, central tendencies, and ranges of economic projections, 2020–22 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. Uncertainty and risks in economic projections

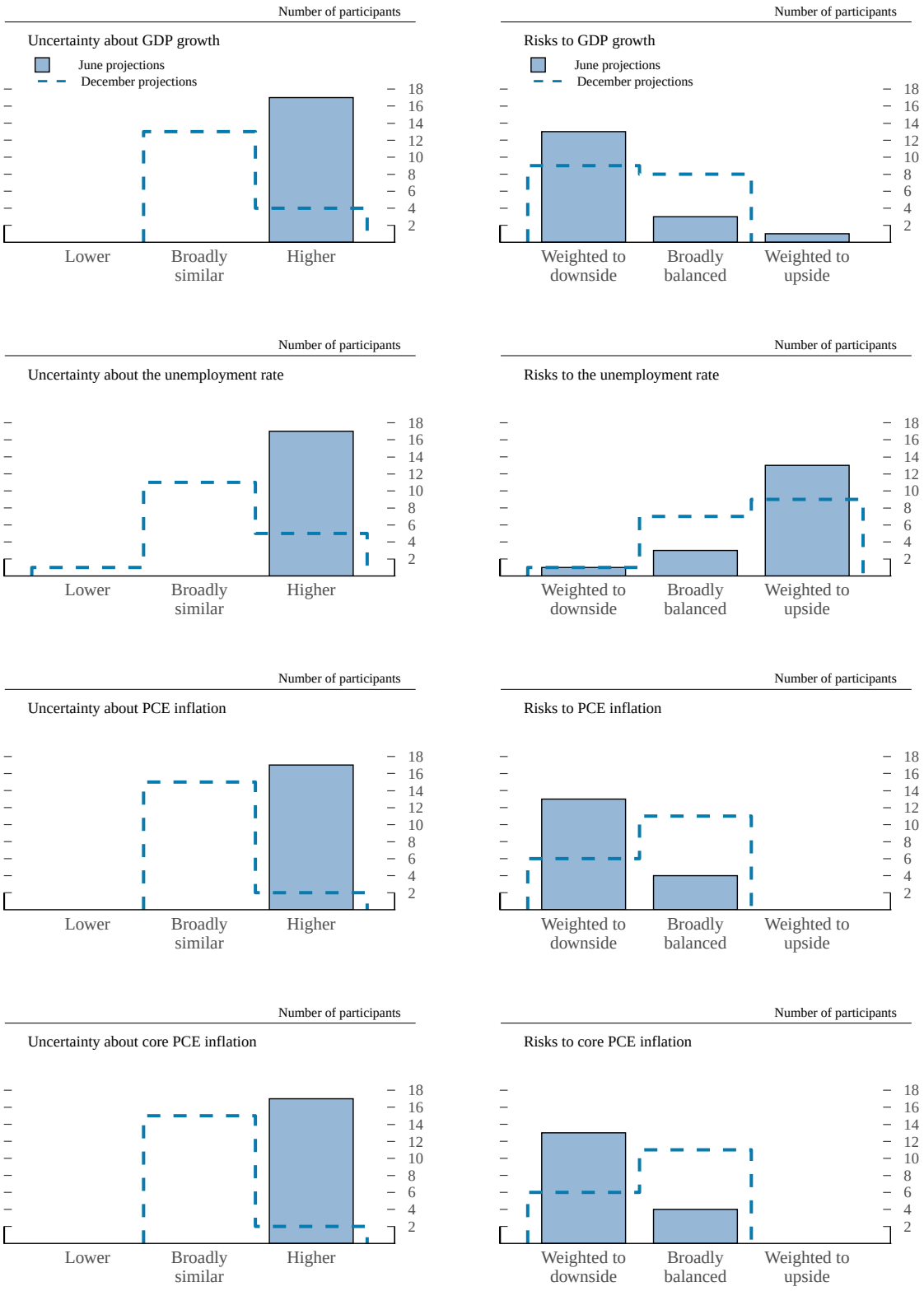
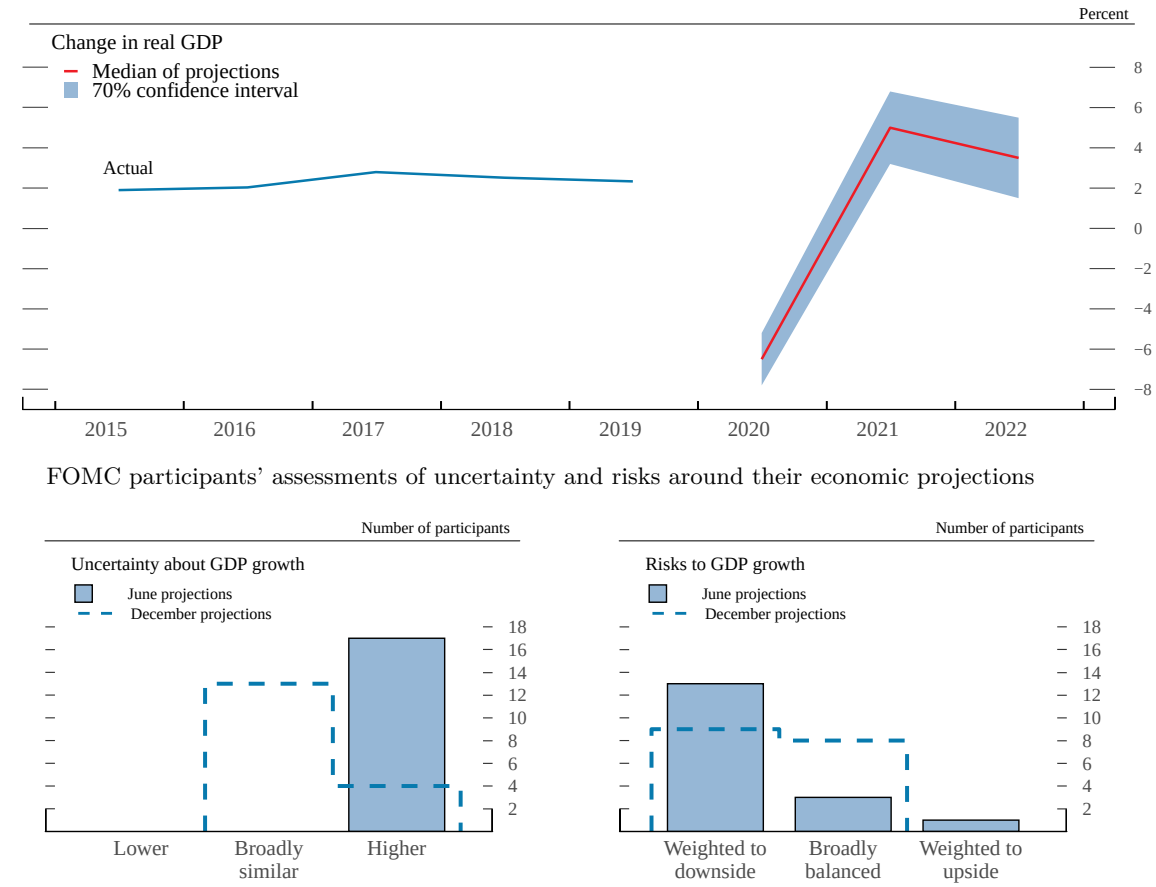
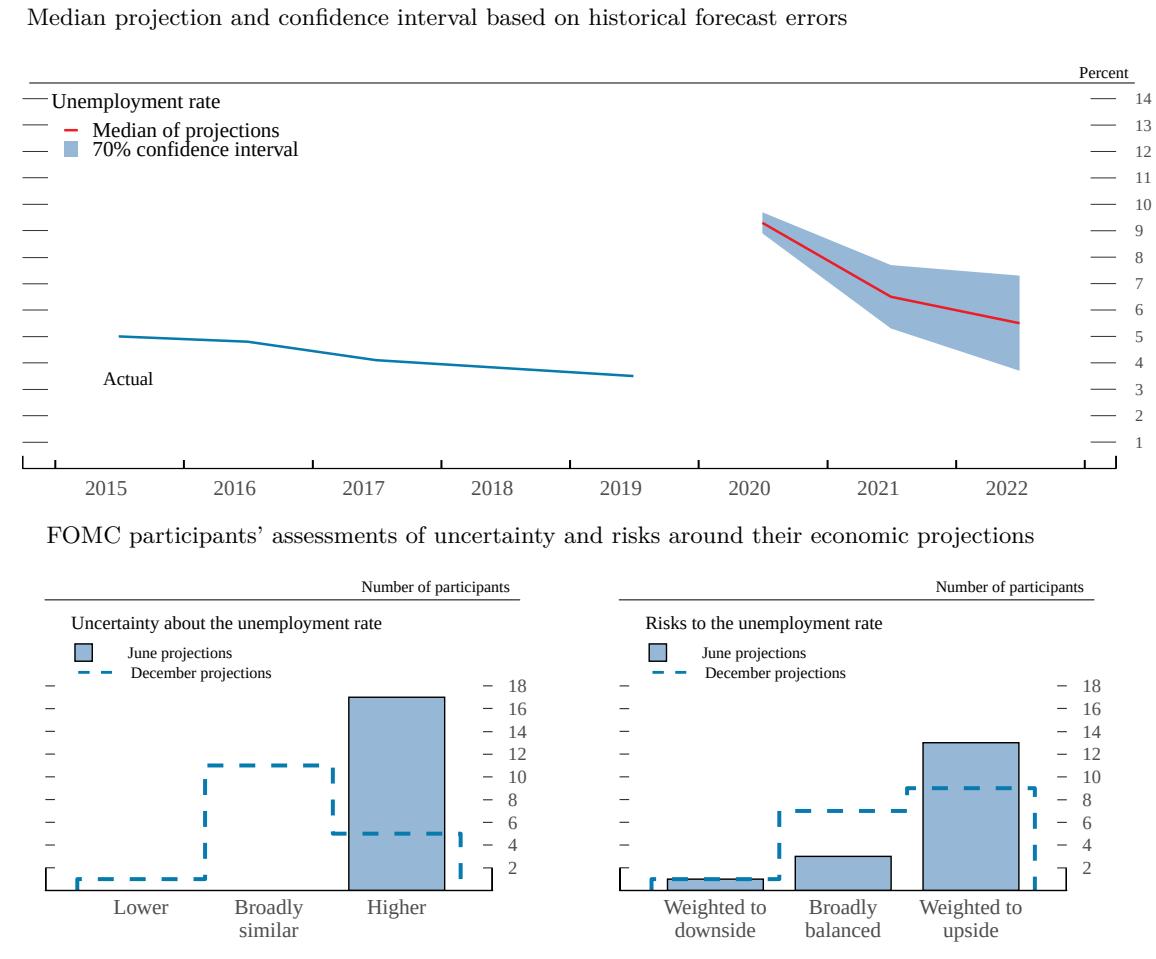


Figure 4.A. Uncertainty and risks in projections of GDP growth



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."

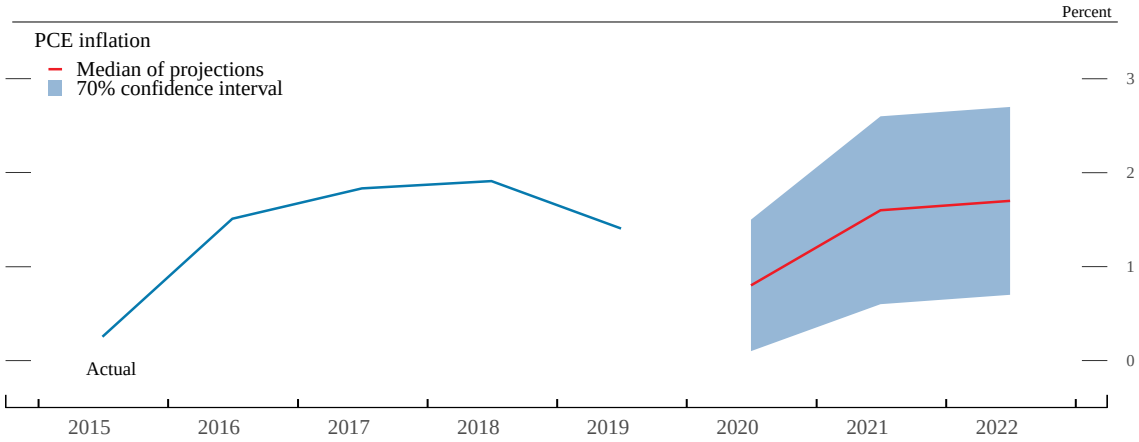
Figure 4.B. Uncertainty and risks in projections of the unemployment rate



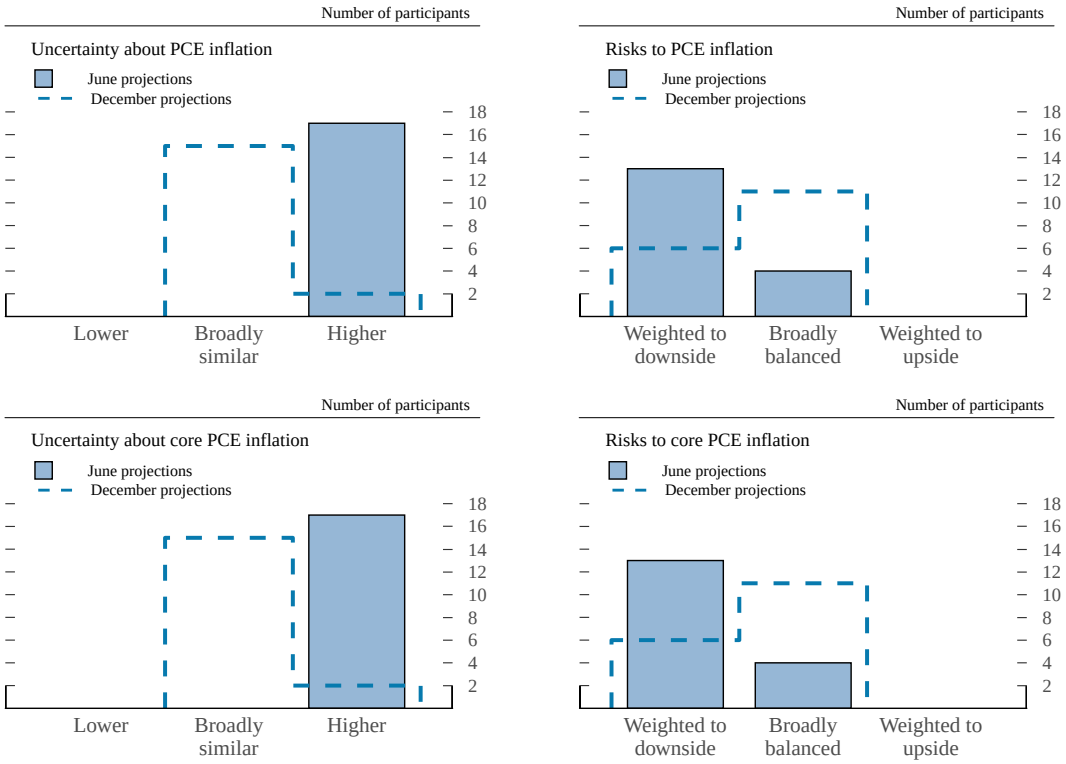
NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root 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

Median projection and confidence interval based on historical forecast errors



FOMC participants' assessments of uncertainty and risks around their economic projections



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	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Unemployment rate	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
PCE inflation	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Core PCE inflation	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

A = Higher B = Broadly similar C = Lower

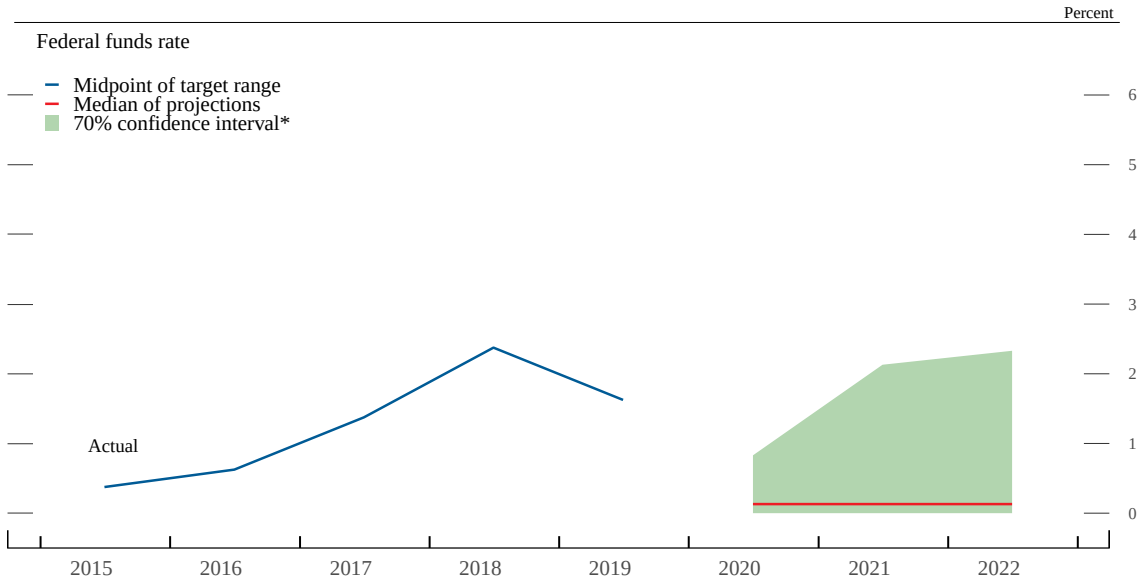
Question 2(b): Please indicate your judgment of the risk weighting around your projections.

Individual responses

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

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

Figure 5. Uncertainty and risks 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 onset 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 fix or six years, please indicate 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: The convergence process that I envision is a transition from the reduction in economic activity in March and April 2020 as part of an investment in public health to a macroeconomic regime similar to one existing in early 2020, albeit one with some significant differences in relative prices and other dimensions, such as the use of work-from-home. I expect inflation to converge in 2021 and both GDP growth and unemployment in 2022.

Respondent 2: Besides the near- and medium-term effects discussed in my projection narrative, the COVID outbreak could have substantial effects on the long-run structure of the economy; however, I have little confidence at this time that I can assess those potential effects on the longer-run SEP variables. So for the time being, I am maintaining the assumptions I had in my December submission. My staff and I will continue to evaluate the implications of ongoing developments for the longer-run values of GDP growth, unemployment, and interest rates.

The potential for shifts due to the COVID shock in potential growth, u*, and r* also pose notable risks to my economic outlook. I discuss those risks as part of my response in question 2(b).

As discussed further in my narratives for monetary policy and for the projections, I anticipate that it will take time beyond the current projection horizon for the SEP variables to converge to their longer run values. I also believe that unemployment and inflation will need to overshoot their long-run levels for a number of years in order to achieve our dual-mandate goals on a sustained basis. Consequently, I expect that it will be the second half of this decade when real GDP growth, unemployment and inflation are all at their longer-run levels.

Respondent 3: N/A

Respondent 4: N/A

Respondent 5: I have lowered my "long run" GDP growth estimate. First, I believe that hours worked will grow more slowly, due in part to a lower path for labor force participation resulting from persistent effects of the covid-19 epidemic. Also, I believe that immigration will be lower in the years ahead than previously predicted. Second, I have lowered my estimate of labor productivity growth. Onshoring supply chains will lower productivity, as will the loss of organizational capital as the epidemic forces business restructuring. I also believe that the path for tangible investment will be lower going forward.

Respondent 6: My projections for real GDP growth, the unemployment rate, and inflation are subject to more uncertainty than usual in light of the significant unknowns about the underlying spread of the Coronavirus, the pace of the domestic and global recovery as the economy begins to gradually reopen, and the low level of oil prices. However, under my modal outlook, I continue to expect real GDP growth and the unemployment rate to converge to its their longer-run levels within the next five or six years. I am less certain that inflation will converge to its longer-run level within this same timeframe. For the past several years, low rates of global inflation, continued appreciation of the dollar, and persistent declines in energy prices have restrained PCE inflation. These elements, combined with the recent increase in domestic labor market slack, lead me to anticipate that these forces will keep inflation below 2 percent throughout the forecast horizon. However, I anticipate that at some point in the future, these effects will fade and policymakers will, at that time, have the opportunity to return PCE inflation to 2 percent.

At this time, I have not made any changes to my projections for the unemployment rate or real

GDP growth in the longer run. While I expect some furloughed workers to be quickly recalled once the economy reopens, the temporary loss of employment could result in some labor market scarring or a more prolonged unemployment spell for some workers. If such developments occur, I will revise up my estimate of the longer-run level of unemployment. While I have not changed my assumptions on longer-run trend growth at this time, I will be watching for signs that the sharp contraction in economic activity during the first half of this year caused some damage to the underlying productive capacity of the economy.

Respondent 7: N/A

Respondent 8: The convergence process should take about 5 years.

Respondent 9: convergence will be within 5 years for all variables

Respondent 10: Recovery from the Great Recession was not complete before the novel coronavirus outbreak in the sense that we had achieved neither full employment nor our 2 percent inflation target. The current recession is considerably deeper than the Great Recession and is likely to result in many bankruptcies and deep scarring in labor markets. As a result, the time needed to complete this evolution is likely to be longer than five or six years.

Respondent 11: N/A

Respondent 12: The unprecedented COVID-19 pandemic and the associated voluntary and mandated social distancing measures have caused a sharp deterioration in economic activity. Aggressive and timely monetary and fiscal policy actions have helped to mitigate the initial downside impacts on U.S. growth, employment, and core inflation during the first half of the year. These actions should also help support a rebound in economic activity in the second half of 2020. The shape of the recovery will primarily depend on the path of the disease itself, which is extraordinarily uncertain. That said, I do not expect a rapid, V-shaped, recovery back to pre-pandemic levels. Rather, my assessment is that, even with aggressive policy measures and a relatively optimistic disease scenario, the economy will take time to heal, not reaching longer run levels until 2023 or beyond. While most recent layoffs have been classified as temporary, a substantial fraction will likely become permanent. Moreover, the historical evidence suggests that it takes time for new employment matches to be established. Given the extraordinarily disruptions to the labor market, there are risks that the unemployment rate could take longer than expected to reach its longer-term level, despite the increase in hiring in May.

Respondent 13: N/A

Respondent 14: Under my modal outlook, the unemployment rate ends 2022 at approximately 6 percent, with PCE inflation of approximately 1.6 percent. At that point, the impact of Covid-19 on mobility and engagement has mostly dissipated, so that typical recessionary dynamics primarily govern the economy's further recovery. Given appropriate policy, I would expect unemployment and inflation gaps to be closed in about three years from that point—-approximately five years from now.

Respondent 15: We expect convergence to full employment and to the inflation target to occur by the end of 2024. The convergence to full employment is slightly faster than it would have been under our old assumptions regarding the natural rate of unemployment. In particular, we have revised up the natural rate by 50 basis points to reflect some of the relatively small, but persistent negative supply effects that are likely to occur in the labor markets due to COVID-19.

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 the uncertainty over the past 20 years, you may enter them below.

Respondent 1: The uncertainty attached to my projections is unusually high because of the challenges stemming from the pandemic. The novel virus meant that health officials were operating with limited information about the effects of the virus and how to mitigate/contain it. The intentional slowdown of the economy is a unique economic shock. The various financial, fiscal, and monetary policy actions have worked well; however, one must acknowledge substantial uncertainty remains concerning the virus and the appropriate actions to re-open the economy. Another source of uncertainty involves the measurement of macroeconomic variables, most notably that of unemployment. Finally, the June 5th employment report is an excellent illustration of the challenges of forecasting/projections in the current environment.

Respondent 2: In this extraordinary period of the COVID outbreak, the signals about the current state of the economy from the data, including the surprising May employment situation report, are difficult to decipher. This then adds to the already-high uncertainty about the economic outlook, which is compounded by the uncertainty surrounding the pandemic itself. Even though it is about six months since the initial reports of the outbreak in China, there remains much to learn about the virus, its progress, and the best public and private measures to address it while awaiting a vaccine or some other effective treatment. Moreover, the medium- and long-term economic effects of the outbreak and measures to address it are still unusually cloudy. Consequently, the uncertainty around the outlook remains extraordinarily high and considerably above the SEP standard.

Respondent 3: N/A

Respondent 4: Course of economy will be governed by course of virus and public health mitigation efforts. I am assuming in my baseline that there is no nation wide second wave of infections, although I do factor in there could be second wave concentrated in particular geo graphic areas that impact activity in those geographies but do not lead to a resumption of nation wide shelter in place orders.

Respondent 5: I fell like it is an impossible dream to forecast the unforecastable at this time.

Respondent 6: N/A

Respondent 7: The pandemic and economic shutdown represent an unprecedented situation that has already resulted in unprecedented job losses and a sharp contraction in activity. Macroeconomic forecasting is particularly challenging at this time given the uncertainties about the course of the COVID-19 pandemic, how households and businesses might respond, and the efficacy of policy actions. There are several plausible paths the virus could take, and several plausible ways that the economy might respond to a particular path for the virus based on the actions of consumers, firms, and policymakers. Thus, the level of uncertainty surrounding the forecast is very high.

Respondent 8: The coronavirus pandemic and the attending lockdowns, and social distancing is both accelerating existing trends and driving new trends in economic interactions and resource allocation. How smoothly this resource reallocation occurs is highly uncertain. As well, it is possible that a significant second wave of the virus might emerge that has a further significant impact on economic activity.

Respondent 9: The evolution of the health situation and the willingness and ability of the pri-

vate and public sectors to respond effectively to it are all highly uncertain. These uncertainties encompass: the effect on the spread of the virus of the relaxation of social distancing mandates; the speed with which successful treatments and a vaccine arrive; whether businesses will be able to make workers and consumers feel safe returning to the job and re-engaging in the retail, leisure and hospitality sectors; and the magnitude of fiscal support coming from the federal government (both to the private sector and to state and local governments). The degree to which business and household caution, disruption in business and worker relationships, and sectoral reallocation impact the recovery are all highly uncertain as well. Similar uncertainties surround the growth prospects of our major trading partners; furthermore, there is uncertainty regarding the effects of the crisis on globalization, including trade policy. Next, there is the question of how and when tax policy could be adjusted to address the large fiscal imbalances. Finally, there is uncertainty over the possible economic consequences of the recent tragic events and civil unrest the Nation has experienced.

Inflation has turned negative as the sectors most directly impacted by the pandemic have seen dramatic price declines. Our projection has inflation rising slowly toward target. This forecast is dependent on the trajectory of aggregate demand and so is subject to the same high level of uncertainty as our outlook for growth. Furthermore, our forecast assumes aggressive monetary accommodation and strong communication will keep inflation expectations anchored; the longer inflation remains below target, the higher the uncertainty over the ability of these actions to support inflation expectations.

Respondent 10: The current level of uncertainty is considerably higher than seen during the financial crisis. The health and economic effects of the coronavirus and their potential implications for financial stability are hard to project. Additional sources of uncertainty include social unrest at home, simmering geopolitical tensions, and the ability of foreign governments to support their economies.

Respondent 11: N/A

Respondent 12: The severity of the decline in economic activity in terms of scale and speed is unprecedented, presenting a difficult challenge for our current suite of economic forecasting models. The projected path for the economy is particularly uncertain given its dependence on the progression of COVID-19 cases. Epidemiological models imply an enormous range of uncertainty surrounding the projected numbers of COVID-19 infections, recoveries, and deaths. These factors translate into markedly higher uncertainty about my projections for economic activity and inflation than the average level over the past 20 years. Although inflation remains anchored by stable longer-run inflation expectations at the FOMC's stated goal of 2 percent, there is heightened uncertainty around the path of oil prices, which magnifies overall inflation uncertainty.

Respondent 13: The COVID-19 global pandemic is outside the realm of recent historical experience. It is a severe and hopefully shortlived shock to both demand and supply that emanated from outside the economic and financial system. Much depends on the course of the virus and the time at which effective therapeutics and vaccines will become widely available–and there is considerable uncertainty around these critical drivers.

Respondent 14: The near-term evolution of the economy will be dictated in large part by the path of the Covid-19 pandemic and the public and private health-care responses to it. There is material uncertainty along all of these dimensions.

Widespread use of masks, ubiquitous testing, smart reconfigurations of shop floors or retail spaces, and other measures would give consumers and workers confidence to reengage in a broader range of economic activities, supporting a stronger recovery. A lack of progress along these lines could keep fearful consumers on the sidelines or, worse, produce a second wave of the virus, with enormous human and economic costs.

While I view rapid breakthroughs in the development of vaccines or treatments as less likely, these are still possibilities; if realized, they would lead to outcomes that surprise to the upside.

Given this wide range of possible outcomes, all of which have at least some plausibility, I believe

uncertainty about the outlook is now much greater than what we have seen, on average, in the recent past.

Respondent 15: Uncertainty around the economic projections is extremely elevated because of the uncertainty surrounding the evolution of the pandemic, the measures taken to contain it, and the potential for significant behavioral changes from households and firms.

Respondent 16: A high level of uncertainty about virus containment, and the timing of effective treatment and prevention, along with the associated responses of people, businesses, and governments.

Respondent 17: Economic conditions will be influenced by the course of the virus and public health actions taken as a result. My forecast assumes an early resumption of economic activity and highly localized public health action (if needed) to mitigate the impact of a future outbreak.

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: My projections are optimistic - the transition is assumed to be quick and smooth. I see two major risks that could derail my view of the transition. A depression and a financial crisis are both possibilities. The longer that the economy remains somewhat shutdown, the more likely a depression and/or financial crisis. Thus, it is important that the staggered re-opening proceed. Thus, I see GDP growth and inflation weighted to the downside and unemployment as weighted to the upside. One policy factor that might affect the transition of the unemployment rate is the supplementary unemployment compensation that is scheduled to expire in July. Whether and how this compensation is modified could affect the unemployment rate. Maintaining this supplementary compensation could increase the unemployment rate and slow the transition. I also think that there is the possibility of upside inflation risk because of release of pent-up demand and supply chain adjustments during the transition. Due to rising oil prices and other factors businesses are also facing increased costs of operating in the current environment. However, on net the inflation risks are weighted to the downside.

Respondent 2: I see the risks around the outlook for real activity as skewed substantially to the downside. The pandemic could be more persistent, either because of medical setbacks or spreading outbreaks in other countries. Even though they may be leading to some economic gains in the short term, the early lifting of government-imposed restrictions when daily case infection rates are still relatively high could lead to renewed increases in cases and deaths. Moreover, history indicates that a "second wave" is a distinct possibility. Consequently, there is a significant probability of a second wave of the pandemic in the U.S. and other countries that have had sizable outbreaks already, leading governments to reinstate some NPIs, households and businesses to pull back activity, and financial conditions to tighten. In that case, there likely would be renewed or more prolonged economic downturns.

Even if there is no second wave, the severe downturn that we have already seen could have set in motion recessionary dynamics that are stronger or more persistent than I anticipate in my projection. For example, such dynamics could come through state and local government austerity dictated by their finances or through more widespread business bankruptcies. As was seen in years following the 2007-09 recession, these effects can have notable adverse impact on aggregate demand and output.

The downside risks more than offset the upside risks arising from either more effective outbreak mitigation measures or more rapid medical advances allowing for faster easing of social distancing actions and thus a more complete reopening of the economy with less sustained damage. Another upside risk is that monetary and fiscal policy actions could be more effective in containing economic damage and promoting a rapid recovery.

The risks around the inflation outlook are also skewed to the downside. An upside risk is that the supply chain disruptions associated with the pandemic could lead to greater upside price pressures than I anticipate. Despite that possibility, I see the disinflationary impact of downside real risks as more dominant.

Besides these medium-term risks to the outlook, the COVID outbreak could lead to substantial long-term structural damage to the economy that reduces investment, contributes to a less efficient labor market, and promotes greater precautionary saving. These effects in turn would lower potential growth and r*, and raise u*. It would also be an environment of weaker economic growth, higher unemployment, and the need for an even lower path for the FFR in the years beyond the projection horizon than is implicit in my central projection.

Respondent 3: Although the downside risks to GDP growth and employment from a prolonged period of social distancing are clear, the risks to inflation, particularly in the near term, are balanced by the extent of damage to the supply side of the economy from business failures, low labor force participation, supply chain disruptions, and delayed investment.

Respondent 4: N/A

Respondent 5: N/A

Respondent 6: N/A

Respondent 7: The pandemic and economic shutdown represent an unprecedented situation that has already resulted in unprecedented job losses and a sharp contraction in activity. Macroeconomic forecasting is particularly challenging at this time given the uncertainties about the course of the COVID-19 pandemic, how households and businesses might respond, and the efficacy of policy actions. There are several plausible paths the virus could take, and several plausible ways that the economy might respond to a particular path for the virus based on the actions of consumers, firms, and policymakers. Thus, the level of uncertainty surrounding the forecast is very high.

In the forecast I am submitting, I am assuming that stay-at-home orders will continue to be gradually lifted over the summer, but some restrictions, including on the size of public gatherings, will remain in effect through the end of the year as testing and tracking capabilities successfully expand. Some treatments become available in 2021 and a vaccine becomes widely available in 2021Q3. While there are periodic upswings in the number of cases until the vaccine is distributed, I assume that the healthcare system is able to handle these increases.

Conditional on this pandemic scenario, there are several downside risks to my forecast: While policy actions have supported the economy, the level of activity and employment remain well below pre-pandemic levels and the nature of this shock – a shock to public health – may be less responsive to policy actions than other shocks that are more economic in nature. Credit quality problems, defaults, and business failures could be higher than expected and this could put stress on banks, which would then curtail lending thereby restraining the recovery. Stresses in the real estate market could also put stress on the financial system. There is some risk that further fiscal action, which is anticipated, will not be forthcoming.

In addition, the pandemic scenario I am conditioning on could be too optimistic. There is some risk that there could be a significant increase in virus cases this fall, which would put a significant burden on the healthcare system and result in a halt to the nascent recovery, as people and businesses revert to stringent social distancing.

The strength of the May employment report shows there could be upside risk to the forecast, too. The job losses in March and April could prove to temporary. The rehiring of workers and pickup in economic activity could prove to be quicker than I've assumed in my forecast.

On balance, I view the risks as weighted to the downside for growth and inflation, and to the upside for unemployment.

Respondent 8: I am concerned that a second wave of the virus may occur and have a significant negative impact on the economy in the fall and winter.

Respondent 9: We see the risks to the outlook for growth and inflation as tilted to the downside, and for the unemployment rate skewed to the upside.

While we forecast a gradual recovery, this outlook is fraught with risks that are mostly to the downside. The most prominent one is the path of the virus. Our projection takes on board the likelihood of localized second waves, but these could instead involve more widespread and severe episodes, with dire consequences for activity. The bounce-back in the labor market and consumer spending in May highlights the risk that activity may return at a faster pace than the health situation warrants. In addition, the arrival of effective treatments and vaccines could come much later than we assume, making social distancing a more long-lasting phenomenon. Our projection incorporates the view that businesses will be able, over time, to provide safe workplaces and consumer environments that make workers feel comfortable returning to the job and consumers willing to re-engage more fully in the marketplace. This could happen faster than we anticipate; however we think there is a more substantial risk that workers and consumers will remain wary for longer than we assume. Other downside risk factors include: the degree to which business failures might destroy business and human capital, including supply chains; the effect of uncertainty on business investment and

household precautionary saving; fiscal policy; and the size and timing of sectoral restructuring. It is certainly possible that these factors will be more benign than we have assumed, but we view the prospect of them pulling down activity further as more likely. Therefore, we view the risks to growth as tilted to the downside, with mirroring upside risks to the unemployment rate.

The downside risks to our growth forecast also impart downside risks to our inflation forecast. In addition, we have assumed that monetary accommodation and an effectively communicated commitment to our symmetric inflation objective will keep inflation expectations anchored. However the continuation of the long run of inflation below target may cause inflation expectations to drift lower, taking inflation down with them. An important upside risk is that the large fiscal deficits come to be viewed as unsustainable, and the public may come to expect that monetary policy will be used aggressively to inflate away the debt. We view this outcome as possible but unlikely.

Respondent 10: My projections for output and unemployment are sufficiently downbeat that the uncertainty around them is broadly balanced. The risks to my inflation projections are weighted to the downside because inflation was stubbornly below target in the years leading up to the current recession, despite record low levels for the unemployment rate.

Respondent 11: N/A

Respondent 12: Despite continued growth in the number of COVID-19 cases, the majority of state and local governments are beginning to relax containment measures. This change increases the probability that a second wave of COVID-19 cases emerges in coming months, perhaps triggering a renewal of stricter containment measures. This scenario poses increased downside risks to my forecast for output growth, labor market conditions, and inflation. Further downside risk stems from the recent civil unrest that has erupted across the country, which could not only reduce economic activity but also hinder containment of the COVID-19 pandemic.

Respondent 13: N/A

Respondent 14: Behind my modal outlook is an assumption that public and private institutions will take health-care-related actions that are sufficient to allow consumers and workers to confidently reengage with the economy, without sparking a second wave of the virus.

While I attach some probability to the possibility of a second wave scenario, which would overwhelm the health care system, I believe this is not likely given the population density of numerous states and the vigilance of citizens in more dense cities and states. It is also plausible that the number Covid-19 new cases and daily deaths will moderate more rapidly than in my baseline, and that we will see new cases only increasing in a limited number of isolated locations, which will rapidly detect and contain them. In that case, I would expect the economy to re-open faster than anticipated in my modal outlook and personal consumption expenditures to bounce back more rapidly, supported by the high level of fiscal stimulus and low interest rates.

Respondent 15: Our projection for activity is approximately an average of the Tealbook's baseline forecast and of the 'second waves' scenario. As a result, risks around our real outlook are more balanced than in the Tealbook, but still tilted to the downside. This mainly reflects the possibility of more supply side damage from unemployment, bankruptcies, and uncertainly than what is assumed in our projections. Given the possibility of additional supply side damage, risks around the inflation forecast are more broadly balanced.

Respondent 16: I view the overall risks for economic activity as weighted to the downside. In particular, I see the a resurgence of the virus that significantly damages the recovery as being reasonably likely. There is also a negative risk from a larger and more permanent retrenchment within some industries

than I have assumed as firms reevaluate their business models. My baseline forecast also assumes an additional fiscal package this year. The absence of this support would slow the recovery relative to my baseline. It possible that our forecast will turn out to have been too pessimistic and we have underestimated the ability of the economy to rebound strongly and quickly. The positive surprise in the May labor report is consistent with that possibility. However, this may also simply mean that the trough in the downturn has occurred a month sooner than I had previously anticipated, without materially changing the trajectory of the recovery.

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 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: Assuming the economy transitions as I expect, increases in the federal funds rate during 2022 will be appropriate. Inflation converges to 2.0 percent in 2021. During 2022, the economy converges to a GDP growth rate of 2.0 percent. Meanwhile, the unemployment continues to decline during 2022, converging to 4.25 percent.

Respondent 2: 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. Based on the latter two factors, the major underlying principle for monetary policy over the coming years should be to provide a high degree of accommodation using all available tools to support to a recovery from the severe downturn that eventually will have the economy to a situation of unemployment at or below 4 percent and inflation averaging 2 percent.

As stated in my response to question 1(c), I am not changing my longer-run assumptions in this SEP, and so I judge that the range for r* is 1/4 - 1/2 percent. Adding in the 2 percent inflation objective, my range for the longer-run federal funds rate is 2 1/4 - 2 1/2 percent and I submitted again the midpoint of 2 3/8 percent as my estimate.

Because the economy will need to recover from a large hole, policy should be very accommodative to achieve the FOMC's goals in due time, and I thus anticipate that the federal funds rate will remain at its effective lower bound through the projection horizon and quite some time beyond that. I also believe that forward guidance should be used strongly to support that policy stance. To preclude the forming of expectations of a fast normalization of policy once it becomes appropriate to raise the policy rate, it will be important that forward guidance strongly indicates our willingness to sustain a highly accommodative stance of policy until we are confident of the achievement of our longer-run goals on a sustained basis. I also anticipate that the FOMC will use its other tools, including asset purchases, to provide further appropriate accommodation during the projection horizon. In addition, it is important that the FOMC concludes its framework review soon and publishes a framework and consensus statement that communicates the principles and strategy underlying its policy stance during this period and beyond.

Respondent 3: By the end of 2022, I expect growth to still be running significantly above potential with both unemployment and inflation approaching their long-run normal levels. Therefore, it will be prudent to begin increasing the target range from the effective lower bound in order to be able to do so at a measured pace.

Respondent 4: N/A

Respondent 5: N/A

Respondent 6: My judgment regarding the appropriate path of the federal funds rate is predicated on promoting sustainable economic growth, maximum employment, and price stability. My modal outlook over the next couple of years calls for the level of output to remain below its trend prior to the Coronavirus, unemployment above its longer-run rate, and inflation to be persistently below two percent. Given this outlook for the economy, I expect the federal funds rate to remain at the effective lower bound for some time. While the risks to these objectives posed by the Coronavirus and its economic effects are difficult to quantify, I see significant downside risk around this outlook, which may require further accommodation if such risks are realized.

Moreover, I anticipate that recent oil price declines will lead to deflationary impulses at a time when inflation expectations are already low relative to historical norms. As the virus- and oil-related effects fade at some point in the future and inflation and employment are on track to achieve our mandates, I expect policy rates to gradually increase closer to my estimate of its longer-run level. However, I see the timing of such adjustments remains highly uncertain.

In the process of forming my policy view, I consider the contour of rates prescribed by benchmark policy rules. However, I find policy rules less useful at this time for guiding the near-term path of the federal funds rate for two reasons. First, policy rules do not consider the need to manage the emerging risks to the outlook posed by recent developments. Second, in light of the uncertainty surrounding the macroeconomic implications of the Coronavirus and the economy's reopening, the interest rate prescriptions from benchmark policy rules are also subject to considerable uncertainty at this time. In the future, as risks either materialize or fade and the economic consequences of recent developments come into clearer focus, benchmark policy rules may again serve as a useful reference for determining the timing and pace of future policy adjustments.

Respondent 7: In my forecast, the economy begins to recover in the second half of this year and continues to make progress over the forecast horizon. However, the shock has been a very deep one and combines both demand- and supply-side aspects. After the economy reopens, factors such as changes in consumer behavior including shopping preferences, household living preferences, firms' demand for office space, and the reestablishment of more robust supply chains, could necessitate structural changes to the economy which may take some time to work through. The recovery will need to be supported by accommodative monetary policy over the forecast horizon. By the end of the forecast horizon, inflation is still running below the 2% longer-run objective and while there has been a significant decline in the unemployment rate, the economy has still not returned to maximum sustainable employment. Thus, I do not anticipate an increase in the funds rate will be appropriate over the forecast horizon.

Whether stronger forward guidance than what we have communicated so far and whether balance sheet policy will be required will depend on the path of the recovery. Currently market participants and the public already expect that the funds rate will remain low for some time so there is no urgency to change our forward guidance. However, in my forecast, I have assumed that the FOMC will offer stronger forward guidance later this year to support the recovery and the achievement of our dual mandate goals. I have also assumed that the Committee will transition from its program of asset purchases intended to smooth market functioning to a program that purchases longer-term assets to support the recovery.

Respondent 8: I anticipate that the economic reallocation that will occur in response to the pandemic will take some time to play out, especially in the labor market. My forecast calls for the unemployment rate to be above the natural rate over the next three years and the inflation rate to remain well below the FOMC target. Consequently, the federal funds rate remains near the ELB over the forecast horizon.

Respondent 9: The first-best policy response to the virus lies with other government authorities and healthcare providers. Nonetheless, monetary policy can cushion some of the decline in aggregate demand,

bolster sentiment, ease financial conditions, and support financial market functioning. Given the many downside risks to economic activity, monetary policy should respond aggressively and communicate strongly our commitment to achieving our dual mandate objectives with all the tools available to us.

In our view, appropriate policy will leave the federal funds rate at the effective lower bound through the end of 2023. We then assume a gradual path of increases, with the funds rate reaching a long run equilibrium of 2.50 percent in mid-2026. Specifically we have one 25 bps rate increase in 2024:Q1 and then starting in 2024:Q3 one 25 bps increase per quarter until 2026:Q2. We also assume forward guidance and asset purchases will be applied as already communicated by the Committee until the prospects for employment and inflation become clearer. Once they do, we think it likely will be appropriate to adopt some more explicit conditionality regarding our intentions for both policy rates and the balance sheet.

Respondent 10: My assessment of appropriate monetary policy reflects the highly adverse and uncertain effects of the coronavirus outbreak and the past, present, and potential future social distancing measures to mitigate the outbreak's spread. The sharp decline in economic activity in recent months and the gradual and likely uneven recovery calls for the funds rate to remain at its effective lower bound for the foreseeable future. Even after the outbreak passes and social distancing measures are no longer in place, the economy will require the support of accommodative monetary policy for some time. Before the health crisis hit, the economy had not reached full employment and inflation had been running below target, so we started the current recession still in need of monetary accommodation more than a decade after the financial crisis. We should not repeat the mistakes made during that recovery of reducing accommodation prematurely – or even signaling that we might do so.

Respondent 11: N/A

Respondent 12: My near-term view of the appropriate funds rate path reflects the magnitude of the actual and expected losses to production, employment, and income from the COVID-19 outbreak. In addition, the pandemic's negative effect on global aggregate demand together with a sharp decline in oil prices will exert ongoing downward pressure on inflation in the near-term. Given that inflation was already below our 2 percent target before the pandemic, I view sustained and significant policy accommodation as essential to help return output to trend and push inflation up, closer to target. Appropriate monetary policy is therefore significantly accommodative for the next several years. I assume additional forward policy guidance and quantitative easing will be important elements of this accommodation. I have slightly reduced my estimate of the longer-run normal value of the federal funds rate based on my staff's recent econometric estimates of r-star.

Respondent 13: I anticipate we will soon put in place outcome-based forward guidance that will govern the liftoff of the federal funds rate from the lower bound. I do not anticipate that full employment and 2 percent inflation will be restored during the forecast horizon.

Respondent 14: The Covid-19 shock combines elements of shocks to both demand and supply, though I believe it's clearly the demand shock that is dominant. In particular, a combination of reduced opportunities for (safe) consumption and justified caution on the part of households has led to a surge in savings and a likely substantial drop in the short-run neutral rate of interest.

It is also unlikely that the economy will avoid some of the usual recessionary dynamics, and that even after the effects of the Covid-19 shock have largely passed, we will still be left with substantial unemployment and inflation gaps.

Given these circumstances, I believe that appropriate policy will likely entail keeping the fed funds rate at its effective lower bound at least through the whole of the forecast horizon.

Respondent 15: Monetary policy is conditioned on asset purchases and the use of the newly created facilities beyond the amounts required to ensure market functioning. Specifically, and in line with the memo on alternative monetary policies in a pandemic scenario, we assume that the Fed balance sheet will

expand further, by taking on a wide set of private assets through the existing 13(3) lending facilities and the purchase of MBS. The projected pace of balance sheet expansion is $165 billion per month for 12 months, for a total of roughly $2 trillion. This monetary policy action buys insurance against a 'second waves' scenario. Should such an outcome not materialize, the likely trajectory of the unemployment rate still implies that there will be time to recalibrate policy to best achieve our dual mandate.

Respondent 16: I do not anticipate any need to raise the level of federal funds rate until the unemployment rate is clearly in the neighborhood of its longer-run level.

Respondent 17: N/A

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: My projections require that the staggered re-opening of the economy proceeds smoothly. My expectation is that ubiquitous testing and risk-based stay-at-home actions can provide the foundation for such a result. Above I have indicated the heightened uncertainty and risks in the current environment. I have also highlighted the measurement issues associated with near-term projections. Finally, I stressed the importance of some phase-out of supplemental unemployment compensation.

Respondent 2: As the path of the COVID pandemic and the measures and actions to address it are primary influences on the medium-term economic outlook, I begin with a short description of the assumptions regarding those factors.

Importantly, my central projection is predicated on there being no significant "second wave" of the pandemic. I see social distancing actions—whether prompted by government recommendations or endogenous behavior—as helping to reduce the probability of a second wave, but COVID-19 will remain a feature that affects the outlook throughout the projection horizon, as it will take time before widely available vaccine or treatments can subdue the pandemic.

The government-imposed shutdowns across much of the nation have had considerable and widespread adverse impacts on economic activity that peaked in April. These shutdowns have been lifted relatively quickly since late April, which appears to have contributed to the improvement in labor market conditions in May.

Nevertheless, social distancing actions will continue to have adverse effects on economic activity and I expect that they will recede fairly slowly, much like in the Tealbook forecast. Their effects will not be as widespread or severe as the shutdown impact, but they will be evident on major sectors that are heavily dependent on face-to-face interactions. Consequently, the effects from the COVID-19 outbreak will hold down economic activity well beyond the current quarter.

The monetary and fiscal policy actions announced and enacted so far have been instrumental in limiting the economic damage from the outbreak and shutdowns, which will also contain the detrimental effects from the downturn on medium-term activity that would have otherwise occurred. Focusing on fiscal policy, the several pieces of COVID-related legislation have provided considerable near-term support to household and business income. I anticipate that an additional fiscal package will be passed in the near term that will limit the extent of any fiscal "cliff effects" in the last quarter of this year. Even so, fiscal impetus likely will be negative next year.

Turning to my economic projection, even with the policy actions undertaken and the accommodative monetary policy stance over the projection horizon, the shutdowns of large portions of the economy will lead to a sharp drop in real GDP over the first half of this year. With the shutdowns now being lifted, activity has begun to pick up, which has been evident in some of the high-frequency indicators of economic activity. I thus project seemingly high growth rates in the second half of this year, but real GDP in 2020Q4 still will be about 5.5 percent below its 2019Q4 level.

Beyond this year, recovery dynamics and continued accommodative monetary policy contribute to growth in 2021 and 2022 that is significantly above my assumption of its potential rate. Nevertheless, because of the economy is digging out of a large hole, real GDP at the end of 2022 is still somewhat below its potential level. Consistent with that pattern of real GDP growth, the unemployment rate declines from its current high level over the rest of the projection horizon. By the end of 2022, it is still appreciably above my estimate of u*.

Inflation has fallen to low levels in the past couple of months, and I anticipate that it will remain very low for the first half of this year. Against a backdrop of stable inflation expectations, a recovery in the real economy, shrinking resource slack, and very accommodative monetary policy, I project that inflation will rise over the rest of the projection horizon, with core PCE inflation in 2021 and 2022 at 1.5 percent and 1.8

percent (Q4/Q4), respectively. With that increase in inflation, 2022 core PCE inflation would be back near where it was prior to the COVID outbreak.

Respondent 3: The overarching element of the short- and medium-term forecast remains the considerable uncertainty about the spread of COVID-19 and federal, state, and local actions to combat that spread. Underlying my forecast is an assumption that governments will continue to ease social distancing measures over the course of this year. Despite that easing, advances in public health practices (e.g., widespread testing and mask use) will limit the spread of the disease in coming months and significant restrictions will not be re-imposed later in the year.

With restrictions easing, pent up demand and continued unprecedented amounts of fiscal support drive a strong recovery in the third quarter and into 2021. However, that recovery is tempered somewhat by the damage done to the supply side of the economy during the period of substantial social distancing and by fundamental changes in work arrangements that reduce demand relative to the pre-pandemic period.

Respondent 4: Course of economy will be governed by course of virus and public health mitigation efforts. I am assuming in my baseline that there is no nation wide second wave of infections, although I do factor in there could be second wave concentrated in particular geo graphic areas that impact activity in those geographies but do not lead to a resumption of nation wide shelter in place orders.

Respondent 5: I have adopted the Tealbook assumption that a reasonably effective COVID-19 vaccine will become available in Q3 2021. And while I believe that an upsurge in infections could occur beginning in Q3 2020, I also believe that hospital capacity will be adequate even without reimposing social distancing. Moreover, testing capacity will have expanded greatly and we will have developed some contact tracing ability. Accordingly I am putting a lower probability on the Tealbook's pessimistic alternative scenario.

Respondent 6: Central economic outlook: My forecast for real GDP growth calls for growth to significantly slow in the first half of 2020 as the economy absorbs the combined effects of the Coronavirus and oil price shocks. As the economy begins to reopen and oil prices stabilize, I expect some bounce back in economic activity, however, I expect the unemployment rate to stay elevated and the level of output to remain below its pre-virus trend for some time. Core PCE inflation is likely to be weighed down in the near term by falling import prices and weaker domestic demand and Energy prices are poised to contract in the first half of 2020 given the sharp drop in oil prices.

Uncertainty and risks: There are significant uncertainties and downside risks to my outlook for growth, employment, and inflation. Should the Coronavirus and attempts to limit its spread cause firms to face a longer-than-expected period of weak demand, firms exhaust cash flows or encounter difficulty obtaining working capital loans, then the economy may experience a longer lasting increase in the unemployment rate. Even if these more severe effects on the US economy fail to materialize, the US economy remains exposed to global efforts to combat the spread of the virus. The threat of persistently slow foreign demand is especially acute in an environment where many central banks have limited scope for easing policy.

If these further downside risks were to materialize, then inflation would likely drift lower amid weakening domestic activity, the foreign exchange value of the dollar would likely increase, and we would observe continued weakness in commodity prices. The downside risks to inflation may be amplified given that inflation expectations are already low relative to historical norms and further disinflationary forces could erode the degree to which inflation expectations are anchored.

Respondent 7: The coronavirus pandemic is a global public health crisis that has inflicted pain and hardship on people all over the world. The virus and the aggressive social distancing measures that the country has taken to limit the spread of the virus resulted in a shutdown of much of the economy, with unprecedented declines in economic activity and job losses, and a reduction in inflation. Much of the economic sacrifice in the interest of public health has been borne by the most vulnerable in our economy: lower-income workers and communities and small businesses. Both fiscal and monetary policymakers have

taken actions to help the economy make it through the shutdown period. Fiscal support has taken the form of direct payments to individuals, expanded unemployment insurance benefits, and grants and loans to certain businesses hit hardest by the pandemic. Monetary policymakers have lowered interest rates and set up facilities to support the smooth functioning of financial markets and the flow of credit to households and businesses. With expanded healthcare capacity and some evidence of control of the spread of the virus, states have begun to relax some of their social distancing restrictions.

Macroeconomic forecasting is particularly challenging at this time given the uncertainties about the course of the COVID-19 pandemic, how households and businesses might respond, and the efficacy of policy actions. There are several plausible paths the virus could take, and several plausible ways that the economy might respond to a particular path for the virus based on the actions of consumers, firms, and policymakers. Thus, the level of uncertainty surrounding the forecast is very high.

My submitted forecast is conditioned on the following pandemic scenario: I am assuming that stay-at-home orders will continue to be gradually lifted over the summer, but some restrictions, including on the size of public gatherings, will remain in effect through the end of the year as testing and tracking capabilities successfully expand. Some treatments become available in 2021 and a vaccine becomes widely available in 2021Q3. While there are periodic upswings in the number of cases until the vaccine is distributed, I assume that the healthcare system is able to handle these increases.

Under this scenario, I anticipate that the second quarter will show the most severe effects on the economy and that the economy begins to recover in the second half of the year as states continue to relax restrictions and people begin to feel more comfortable reengaging in economic activity. Even so, some industries including travel and leisure and hospitality will be slower to recover than others.

The recovery continues over the forecast horizon, with declines in the unemployment rate and gradually rising inflation, with support from policy actions that help the economy to avoid more persistent damage. Starting from a low base, some of the growth readings will be quite robust. However, the shock has been a very deep one and combines both demand- and supply-side aspects. After the economy reopens, factors such as changes in consumer behavior including shopping and dining preferences, household living preferences, firms' demand for office space, and the reestablishment of more robust supply chains could all necessitate structural changes to the economy, which may take some time to work through. While a significant number of workers who lost jobs during the shutdown period will be rehired, others will need to retool for jobs in different sectors.

The recovery will need to be supported by accommodative monetary policy over the forecast horizon. By the end of the forecast horizon, inflation is still running below the 2% longer-run objective and while there has been a significant decline in the unemployment rate, the economy has still not returned to maximum sustainable employment. Thus, I do not anticipate an increase in the funds rate will be appropriate over the forecast horizon.

Whether stronger forward guidance than what we have communicated so far and whether balance sheet policy will be required will depend on the path of the recovery. Currently market participants and the public already expect that the funds rate will remain low for some time so there is no urgency to change our forward guidance. However, in my forecast, I have assumed that the FOMC will offer stronger forward guidance later this year to support the recovery and the achievement of our dual mandate goals. I have also assumed that the Committee will transition from its program of asset purchases intended to smooth market functioning to a program that purchases longer-term assets to support the recovery.

I have also incorporated further fiscal policy support in the form of support to state and local governments and further direct payments to households.

There are both downside and upside risks to my forecast; I see the risks tilted to the downside, in particular because there is the potential for a different pandemic scenario. In this more severe virus scenario, cases rise fast enough this fall to put significant stress on the healthcare system in some parts of the country. Even though governors will find it hard to gain enough public support to reinstate restrictions seen in the first shutdown, there are likely to be voluntary restrictions on activity. The reduction in economic activity would result in sharp falls in spending, with more permanent job losses, business failures, and credit defaults.

On the upside, if there is faster progress on COVID-19 testing, contact tracing, and capacity in the

healthcare system, the expected increase in cases in the fall would be less disruptive to economic activity resulting in a stronger recovery.

I put the greatest likelihood on the virus scenario on which I conditioned my forecast (65%), with the severe virus scenario at 25% and the more benign scenario at 10%.

Respondent 8: My baseline forecast presumes that there will not be a second wave of the virus that has a large impact on the economy in the months ahead, though I do see that as a significant downside risk. Even without a second wave though, I anticipate that economic recovery will be hampered by the reluctance of firms and households to return to pre-pandemic levels of activity until a vaccine is widely available. Uncertainty about the virus and the attending caution on the part of consumers will have a significant impact on sectors such as education, healthcare, and travel which will be slow to recover. In addition, state and local government budgets are being hard hit and are unlikely to be a significant source of hiring and spending over the medium term. Fiscal policy is likely to provide further support to the economy but I anticipate that this will be in the form of enhancements to existing programs rather than the roll out of major new initiatives.

Respondent 9: Our forecast assumes remaining government limitations on individuals' mobility are lifted over the coming weeks and that restrictions on workplace activity are mostly phased out over the remainder of the year. Voluntary restraints on behavior undoubtedly will remain until a vaccine or effective treatments are available. We assume some improvement in therapeutics as we move through the projection period, but that a vaccine will not be available until late 2021 and then may take some time to become widely available. We do not assume an outright second wave of the virus that forces a wide-scale re-shutdown of the economy. That said, we have built in a slower rebound in the second half of this year than otherwise to capture the view that intermittent surges in infections around the country will slow the pace of recovery. Our fiscal policy assumptions are similar to the Tealbook.

Incoming data show a dramatic collapse in activity in April. However high frequency spending and mobility data are consistent with activity beginning to recover in May as states began to relax their social distancing measures. Spending on autos has shown promising signs of a recovery. And of course the May labor market report was quite positive relative to expectations. If these trends continue, the second half of 2020 will show significant growth even though the level of activity by the end of the year remains substantially below pre-crisis levels.

Even though we assume a medical solution is not available until late 2021, growth should proceed at a solid pace in 2021, as the virus runs its course and businesses and households adapt further to the new working environment. With the health innovations assumed for late 2021, the economy returns to a semblance of business-as-usual in 2022, closing the output gap by the end of the year—though at a level of potential output that is about 2 percent lower than we anticipated in March.

Some of the swings in GDP growth over the projection period reflect corresponding swings in potential output. We assume declines in potential labor input (due to stay-at-home restrictions) and lower TFP (due to actions needed to work safely) cause the level of potential output to fall in the first half of this year. These conditions are subsequently largely unwound by the relaxation of stay-at-home restrictions, the completion of safety-enhancement projects, and, eventually, health innovations. All told, we now assume potential output falls 1 percent in 2020 and then grows about 2-1/4 percent on average in 2021 and 2022. This compares with our previous assumption of 1.8 percent in each of those years.

As the economy improves in the second half, we have the unemployment rate coming down to 9.5 percent by the end of 2020. We then project it falling to 6.5 percent in 2021 and 5.5 percent in 2022. As with our output projection, the path for the unemployment rate reflects both a supply-side shock and a cyclical rise. We see the natural rate somewhat higher in the near term given the labor input issues noted above. And over the medium term, we assume it will remain modestly above our pre-crisis long-run assumption as restructuring of existing business models and sectoral reallocation of output result in labor mismatch. These factors could keep the natural rate somewhat elevated in 2022. But we still see the long-run neutral rate as being 4-1/4 percent, the same level we assumed for the December SEP. Similar developments are likely to

cause a transitory decline in the labor force participation trend.

We see inflation for 2020 coming in at 1.0 percent. Some of the extreme price declines behind the March and April drop in core prices are likely behind us. For example, demand for lodging and air travel cannot fall any further, and so prices there are likely to have at least stabilized. However, the effects of soft aggregate demand could take some time to show through to stickier prices. Looking ahead, the downward pressure on prices from resource slack should diminish in 2021 and 2022. If inflation expectations do not fall, then this should support some modest increase in core inflation in those years. We have inflation rising to 1.4 percent in 2021 and 1.6 percent in 2022. This forecast assumes a very accommodative monetary policy and a well-communicated commitment by the Committee to achieve its symmetric 2 percent inflation target.

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

Respondent 10: The coronavirus and the past, present, and potential responses to it, both official and unofficial, dominate my outlook. I consider a resurgence of infections in the fall and winter to be more likely than not. This will result in renewed social distancing restrictions and an increased reluctance on the part of households and businesses to engage in economic activity that fosters the spread of the disease. As the virus recedes a second time, "re-opening" will be more gradual than what we are experiencing currently. In addition, many businesses are likely to have declared bankruptcy, resulting in additional, significant scarring in business and labor markets. As a result, I expect that the recovery will be very gradual.

Respondent 11: N/A

Respondent 12: The COVID-19 pandemic and the resulting public health containment measures have sharply reduced my outlook for economic activity during the first half of 2020 relative to the December SEP. Aggressive monetary and fiscal policy actions taken in recent months have helped to mitigate the severe downside impacts of the outbreak on economic activity. I expect these policy actions to help support a rebound in economic activity beginning in 2020Q3. The major hit to the economy is reflected in a substantial drop in aggregate demand. But there is also some short- and medium-run harm to potential output. In the short run, social distancing and shelter-in-place orders reduce potential labor supply and output. Even in the medium run, potential output is reduced. For example, we will see lower productivity in "high-touch" sectors, with mandated separation and additional cleaning demands; we will see some reductions in labor supply by workers who are not willing to take public transit or go into a factory. Eventually, these supply side effects subside—reflecting both the availability of a vaccine as well as aggressive monetary policy over the next few years that prevents hysteresis. My forecast assumes a gradual relaxation of mandated and voluntary containment and social distancing measures, but expects that some degree of restraint on activity lingers for the medium term. I assume some additional fiscal stimulus legislation during the second half of 2020, although significantly smaller in scale than the CARES Act. The uncertainty surrounding my economic forecast is markedly higher than normal due to: (1) the highly uncertain path of the disease that emerges from leading epidemiology models, (2) the difficulty of validating our current suite of economic forecasting models for an environment that is nearly unprecedented, and (3) the recent eruption of civil unrest in major U.S. cities that could hinder a recovery in economic activity and increase the spread of COVID-19. Given the confluence of these extraordinary events, the risks to my forecasts for output growth, employment, and inflation are weighted to the downside.

Respondent 13: Uncertainty and risks associated with the COVID-19 pandemic and measures to contain its spread play a predominant role in shaping both the modal outlook and the assessment of risks. This forecast assumes that as virus-related restrictions are rolled back, there will be periodic flare-ups in various areas of the country, resulting in additional rounds of local restrictions–and this will be accompanied by continued voluntary social distancing until a vaccine becomes widely available.

While the most recent employment report provided some reason to include a somewhat earlier recovery of activity in my modal outlook due to the evidence of somewhat earlier than anticipated rehiring, it also

may have raised the risk that the rate of virus spread (R0) may again increase in some areas, necessitating subsequent waves of social distancing. Accordingly, the probability of a second wave scenario has risen somewhat.

My baseline forecast includes an assumption that Congress passes a stimulus bill later in the summer.

Respondent 14: In the near term, the factors affecting the outlook and risks about it center squarely on the evolution of the Covid-19 pandemic, the public-health actions taken to address it, and the public's behavioral responses. As noted above, my modal outlook assumes the development of practices that can allow consumers and workers to safely increase their mobility and engagement.

To the extent that deterioration in labor market outcomes—increased job-loss and reduced job-finding—have been the result of stay-at-home behaviors arising from the pandemic, we would expect to see a sharper-than-normal improvement in these labor market flows as mobility and engagement return to more normal levels. Pushing in the other direction, toward a slower pace of improvement, are recessionary dynamics—the usual factors of business and household income loss, labor market frictions, and precautionary behavior. On net, I expect that we will see an initially rapid pace of improvement that quickly gives way to a pace more typical of recent recoveries, but the balance between these forces is very much a function of the path of the pandemic.

Ongoing Federal Reserve actions to support financial markets and the flow of credit are essential factors in our outlook, as are the actions taken by fiscal authorities to support businesses and households. More fiscal support will be needed, particularly for states and localities, in order to avoid more severe headwinds to growth as the economy eventually recovers.

Respondent 15: The social distancing and lockdown measures necessary to control the pandemic have resulted in extraordinarily large output and employment losses. Fiscal and monetary policy have reacted quickly to provide relief to households and businesses, restore functioning in key financial markets, and support credit flows to individuals, firms, states, and municipalities. Still, uncertainty remains extremely high as the economic outlook depends on the highly unknown evolution of the COVID-19 pandemic. In particular, there is uncertainty about the epidemiology of the disease, about the public health policy measures that may or may not be taken (regarding, for example, testing and tracing) , and about the behavioral response of households and firms to the pandemic.

Despite the difficulty of putting together an economic forecast under the current circumstances, there are a number of factors we have accounted for in our outlook. First, the majority of pandemics since the early 1700s had a sizable second peak. If history is a guide, one should place significant weight on a 'second waves' scenario, the epidemiologic uncertainty of COVID-19 notwithstanding. Indeed, the lack of coordinated policies at the national level for contact tracing and randomized testing increases the risk of a resurgence of the virus later this year. Second, given the uncomfortably high probability of a 'second waves' scenario, monetary policy should be geared toward taking insurance against such a worse outcome. Our outlook can be viewed as an average of the Tealbook baseline and the 'second waves' alternative scenario. Needless to say, averaging produces an outlook that will miss on both possible outcomes. However, we view the average as consistent with adjusting policy in such a way as to buy insurance. Specifically, our outlook is conditioned on an expansion of the Fed balance sheet–at a pace of $165 billion per month for 12 months starting this summer– via the existing 13(3) lending facilities and the purchase of MBS, for a total balance sheet expansion of roughly $2 trillion. Given the relatively limited scope for lowering Treasury yields, a direct focus on facilitating credit to private businesses and households should prove more effective. The cost of buying insurance now is low. Even under the Tealbook's baseline scenario, the unemployment rate is projected to be above 7 percent by mid-2021, which should provide sufficient time to recalibrate monetary policy should the worse outcome not occur. Third, household fundamentals remain solid because of fiscal policy actions to date to support incomes, and household net worth that remains elevated. While strong fundamentals could result in a sharper rebound in household demand during the second half of this year absent a severe resurgence of the virus, Americans who are between 60 and 79 years of age account for a nontrivial share of purchases in spending categories that are substantially impacted by

social distancing. Because people in this age cohort are more likely to suffer severe health consequences if infected by the virus, they may be particularly reluctant to venture out and spend money until the public health situation improves significantly. As a result, we expect household consumption to be restrained in the second half of this year by voluntary social distancing despite favorable fundamentals. Finally, given the severity of the situation, it is important for monetary policy to pull out all the stops necessary to restore economic health as quickly as possible. Implicit in our forecast is the ability of monetary policy to adjust and expand its lending programs as needed to support economic well-being in a timely and efficient way.

Respondent 16: At the heart of my baseline forecast is the assumption that a vaccine to prevent the virus is not widely available and implemented until at least the second half of 2021. While the baseline does not incorporate a significant second wave of the virus, effective containment of the virus will remain uncertain and will continue to have a significant effect on people's willingness to engage in high density activities. This, combined with typical macroeconomic dynamics, keeps real economic activity below its pre-crisis level until 2022. Financial support provided by the federal government and Federal Reserve actions have helped prevent a much greater collapse in economic activity so far. We assume that there will be an additional fiscal stimulus package in the third quarter of 2020. Based on current proposals we have assumed a package in the order of $500 billion. This additional support will help boost the recovery in 2020, but restrain growth in 2021 somewhat as the effect on spending unwinds.

Respondent 17: Economic conditions will be influenced by the course of the virus and public health actions taken to mitigate its impact. My forecast assumes an early resumption of economic activity and localized public health action (if needed) to mitigate the impact of a future outbreak.

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: Without question, the underlying environment for economic activity - relative prices, work-from-home, social distancing - has changed because of the pandemic. The policy environment, especially the combination of financial, fiscal, and monetary policies implemented recently, has provided much needed support during the pandemic-related slowdown and provides a foundation for my projections.

Respondent 2: As already noted, the COVID outbreak and the associated measures to address it are major influences on the outlook, something that was not anticipated at the time of the December SEP. In addition, the already-enacted and the anticipated future fiscal packages that give some relief to households, businesses, and municipal governments has led to a very different fiscal backdrop than anticipated even a few months ago. Similarly, the announcement and enactment of the many Federal Reserve facilities to support the flow of credit is an important underlying factor in my projection. The accommodative shift in monetary policy also is a significant change since December that influences my projection.

Respondent 3: Despite the efforts of monetary policymakers and the fiscal authorities, it is unlikely that the enormous loss of income from the prolonged period over which the economy was shuttered can be fully offset. Indeed, fiscal policy consolidation is inevitable and will be a drag on growth in 2021 and 2022. In addition, consumers and especially firms will remain cautious, at least until uncertainty is resolved by a successful vaccine or treatment. Some households and firms will need to increase saving and restrict spending even further to service the debt taken on to weather the crisis.

Respondent 4: Course of economy will be governed by course of virus and public health mitigation efforts. I am assuming in my baseline that there is no nation wide second wave of infections, although I do factor in there could be second wave concentrated in particular geo graphic areas that impact activity in those geographies but do not lead to a resumption of nation wide shelter in place orders.

Respondent 5: Well, it certainly seems like a lot has changed ...

Respondent 6: My June projections for growth and inflation have materially changed in light of recent developments regarding the Coronavirus and the collapse in oil prices. Given the lack of any recent historical precedence for these developments, the effects of these developments on my outlook for the economy are difficult to quantify and highly uncertain. With regards to the spread of the virus, I am not assuming that the economy is struck by a second wave of the virus, but I expect that the number of new cases in the United States remains close to its current plateau for some time with voluntary social distancing and intermittent flare ups remaining a headwind to the economic recovery. With regards to fiscal policy, I have incorporated the response of fiscal policymakers that have been passed into law at this time but have not included significantly more fiscal stimulus into my outlook at this time.

Respondent 7: The coronavirus pandemic has led to significant changes in my forecast since the December 2019 SEP.

Respondent 8: The key factors underlying the change in my forecast is the coronavirus pandemic and the economic and policy responses to that shock. I anticipate that there will be further fiscal support for the economy beyond the CARES act, though future fiscal action will be restrained in scope and spending compared to what was rolled out in April.

Respondent 9: The pandemic shock is of unprecedented magnitude and has introduced completely new dynamics to the economy. Consequently our forecast has changed dramatically. We now forecast GDP growth will be 9 percentage points lower this year. Growth is projected to be substantially stronger in 2021 and 2022 compared to December, but this merely reflects a rebound from very low levels. By the end of 2022 the level of GDP is roughly 4.5 percent lower than we forecast in December. The changes in our unemployment and inflation projections are similarly dramatic. Whereas in December we expected the unemployment rate to remain at 3.5 percent throughout the forecast period, we now see it at 9.5 percent, 6.5 percent and 5.5 percent in 2020, 2021 and 2022, respectively. In December we forecast inflation just 10 bps below target in 2020 and overshooting it 10 bps in 2021 and 20 bps in 2022. Now we see it almost a full percentage point lower this year and only rising to 1.6 percent by the end of 2022.

As noted earlier, we have altered our medium term assumptions about potential output and the natural unemployment rate in light of the supply side elements in the pandemic shock. Though we have not changed our assumptions regarding potential GDP growth and the natural rate in the long run, we think it will take some time for the economy to achieve those outcomes.

Given the new economic conditions, our appropriate policy path is significantly lower than in December. Furthermore, independent of the virus outbreak, we lowered our estimate of the long-run federal funds rate by 25 basis points to 2.5 percent, after holding it steady for more than two and a half years. This reflects our assessment of conditions as of March. While the data on real activity and statistical estimates of long-run r* had not changed much at that time, our term-structure models attributed a significant fraction of the decline in long-term nominal yields prior to the virus outbreak to changes in the expected long-run real rate. We have taken some signal from those estimates.

Respondent 10: Coronavirus.

Respondent 11: N/A

Respondent 12: The COVID-19 pandemic has sharply diminished my expectations for economic performance over the medium term. This rapid contraction in economic activity was met by a host of aggressive monetary and fiscal policy measures. Conventional and unconventional monetary policy is assumed to remain significantly accommodative for the next several years. In addition to taking into account fiscal stimulus from the CARES Act and other fiscal relief packages already enacted, my forecast assumes that an additional, though significantly smaller, fiscal stimulus package is implemented during the second half of 2020.

Respondent 13: The global COVID-19 pandemic and the policy response to it have fundamentally altered my outlook since the December 2019 SEP.

Respondent 14: The spread of Covid-19 and its effects on both domestic and global economic activity.

Respondent 15: The current projection is extremely different from our December 2019 projection because of the economic disruptions caused by the COVID-19 pandemic.

Respondent 16: The COVID-19 pandemic was unknown at the time of the December 2019 SEP.

Respondent 17: Economic conditions will be influenced by the course of the virus and public health actions taken to mitigate its impact. My forecast assumes an early resumption of economic activity and localized public health action (if needed) to mitigate the impact of a future outbreak.

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: In light of the heightened uncertainty for projections in the current environment, I would characterize differences between my projections and the Tealbook as relatively small. Unemployment rate projections are quite similar. In 2020 my GDP growth projections are slightly higher than those in the Tealbook, while in 2021 and 2022 my projections are lower. My inflation projections move to 2.0 percent quicker, while those in the Tealbook remain below 2.0 percent.

Respondent 2: Acknowledging that activity has picked up somewhat more rapidly following the lifting of the shutdowns, as reflected in the May labor market report, my projection has somewhat smaller swings in real GDP growth in 2020 and 2021 than in the Tealbook. Still, given the realized and anticipated extraordinary fluctuations in real activity and unemployment as well as the huge uncertainty around forecasts in the current environment, my projections for real GDP and inflation by the end of 2022 are broadly in line with the Tealbook forecast. At the same time, my projection for the path of the unemployment rate is above that in the Tealbook. That difference comes about because I see much of the weakness in the labor market from the COVID shock in industries that have relatively high labor intensity but relatively low value added. Because of adjustment costs, it will take time to fully re-employ workers, even with relatively rapid real GDP growth.

The other difference between these forecasts concerns the monetary policy assumptions. Even though the federal funds rate is at the ELB through 2022 in both forecasts, I assume that the policy rate remains near the ELB well beyond 2022, whereas the Tealbook longer-run forecast has the policy lifting off in 2023. In addition, I assume that asset purchases will extend well beyond this year, while Tealbook B assumes that they will end in December.

Respondent 3: My forecast for the second half of 2020 and first half of 2021 is not quite as optimistic as the Tealbook, reflecting greater damage to the supply side of the economy from disruptions caused by business failures and slower recovery in employment than assumed by staff. The slower recovery in employment in 2020 is partly a result of the incentive effects of expanded unemployment benefits and later by skills mismatch induced by pandemic-related shifts in the composition of employment. In addition, I expect that overall labor force participation will recover more slowly than expected, as was the case after the financial crisis. Separately, some changes made by businesses during the period of social distancing will persist, as telework and travel restrictions remain prevalent, leading to lower-than-expected business spending and nonresidential investment.

Respondent 4: N/A

Respondent 5: N/A

Respondent 6: Relative to the Tealbook baseline, my projections call for a more protracted recovery of the labor market and a slightly lower path for inflation over the couple of years. However, given the unprecedented uncertainty around the recovery, the differences in my projections and the Tealbook forecasts may not be too different once one takes account of the very large uncertainty around the projections.

Respondent 7: Qualitatively, my projection is similar to the Tealbook forecast. The economy contracts in the first half of this year and begins to recover in the second half. The economy grows at an above-trend pace in 2021 and 2022. The unemployment rate peaks in the second quarter and ends the year at 9 percent. It declines further over the forecast horizon but remains above its longer-run level at the end of 2022. Inflation is subdued over the forecast horizon. Monetary policy is highly accommodative over the

forecast horizon, with the federal funds rate remaining at its effective lower bound. I have incorporated stronger forward guidance and longer-term asset purchases into my forecast. I have also assumed further fiscal stimulus, like the Tealbook.

Respondent 8: I anticipate a slower recovery in 2021 and 2022 compared to the Tealbook with slower output growth and higher unemployment. In addition, I expect that inflation will run at a more moderate pace than in the Tealbook.

Respondent 9: Our assumptions for fiscal policy are similar to those underlying the Tealbook's baseline scenario. We assume that sporadic outbreaks of the virus will be somewhat more disruptive than the Tealbook baseline and that it will take more time for a vaccine to become widely available. We also assume a more accommodative path for the federal funds rate as it stays at the effective lower bound for longer and lifts off at slightly slower rate. The broad contours of our forecast are similar to the Tealbook's. That said, largely due to our health assumptions we see an output path that is modestly lower than the Tealbook in the second half of this year and growth running a couple percentage points lower in 2021. We also have unemployment about one percentage point higher in 2021 and 2022; this projection reflects our somewhat more pessimistic view on growth and the impact of the virus on labor market dynamics. The stronger accommodation is necessary to keep inflation expectations anchored in the face of the drag from real activity and help lift inflation toward target. Still, on net, we see inflation coming in a bit lower than the Tealbook over the forecast period.

Respondent 10: I think the effects of the coronavirus outbreak will be comparable to the Tealbook's "Second Waves" scenario. Once the outbreak passes, I think monetary policy will need to be very accommodative for a longer period of time than in the Tealbook's "Second Waves" scenario.

Respondent 11: N/A

Respondent 12: The two projections are largely in alignment around the anticipated path for the federal funds rate. However, I am projecting a somewhat slower recovery and a slightly lower path for inflation. The June 5th update to the Tealbook projects unemployment to decline to 5.5 percent by the end of 2021, and 4.3 percent by 2022. By contrast, I project unemployment to decline to 7.4 and to 6.3 percent over this time frame, respectively. The Tealbook update also shows a stronger recovery in 2021 and 2022 in terms of GDP growth. The update to Tealbook projects that core PCE inflation will reach 1.7 percent by the end of 2022, while I project inflation to reach 1.6 percent. My expectation of slower growth implies a need for additional policy accommodation via forward guidance and perhaps asset purchases.

Respondent 13: N/A

Respondent 14: Some differences relative to the Tealbook no doubt reflect the fact that the Tealbook projections were made before the release of the April employment report, while mine were made after.

Relative to the Tealbook, I see a somewhat faster rebound in GDP growth in 2020:H2, but slower growth thereafter.

With respect to the unemployment rate, my projected path is higher than the Tealbook's, by a small amount at the end of 2020, and more so in 2021 and 2022.

Apart from my projection of somewhat higher headline inflation in 2020, the differences in our outlooks for inflation, both headline and core, are not material.

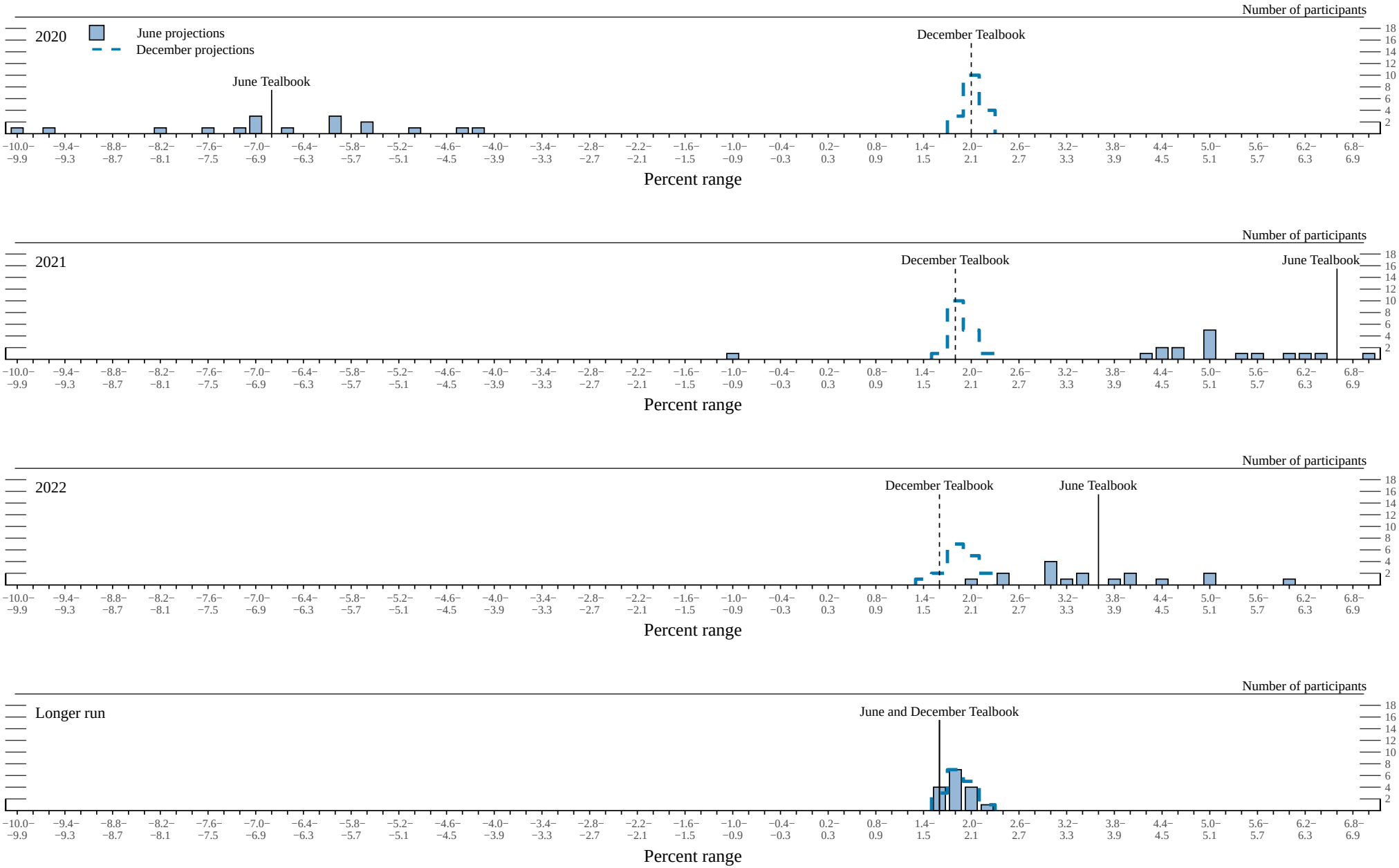
Respondent 15: Our real outlook is weaker than in the Tealbook, and is conditioned on more monetary policy stimulus in the form of a further expansion of the Fed balance sheet. We assume fiscal policy consistent with the path in the Tealbook, which includes an additional $500 billion in fiscal stimulus

later this year. Despite a weaker real outlook, the two forecasts for inflation are the same, as we factor in a somewhat stronger role for COVID-19 related cost-push shocks.

Respondent 16: N/A

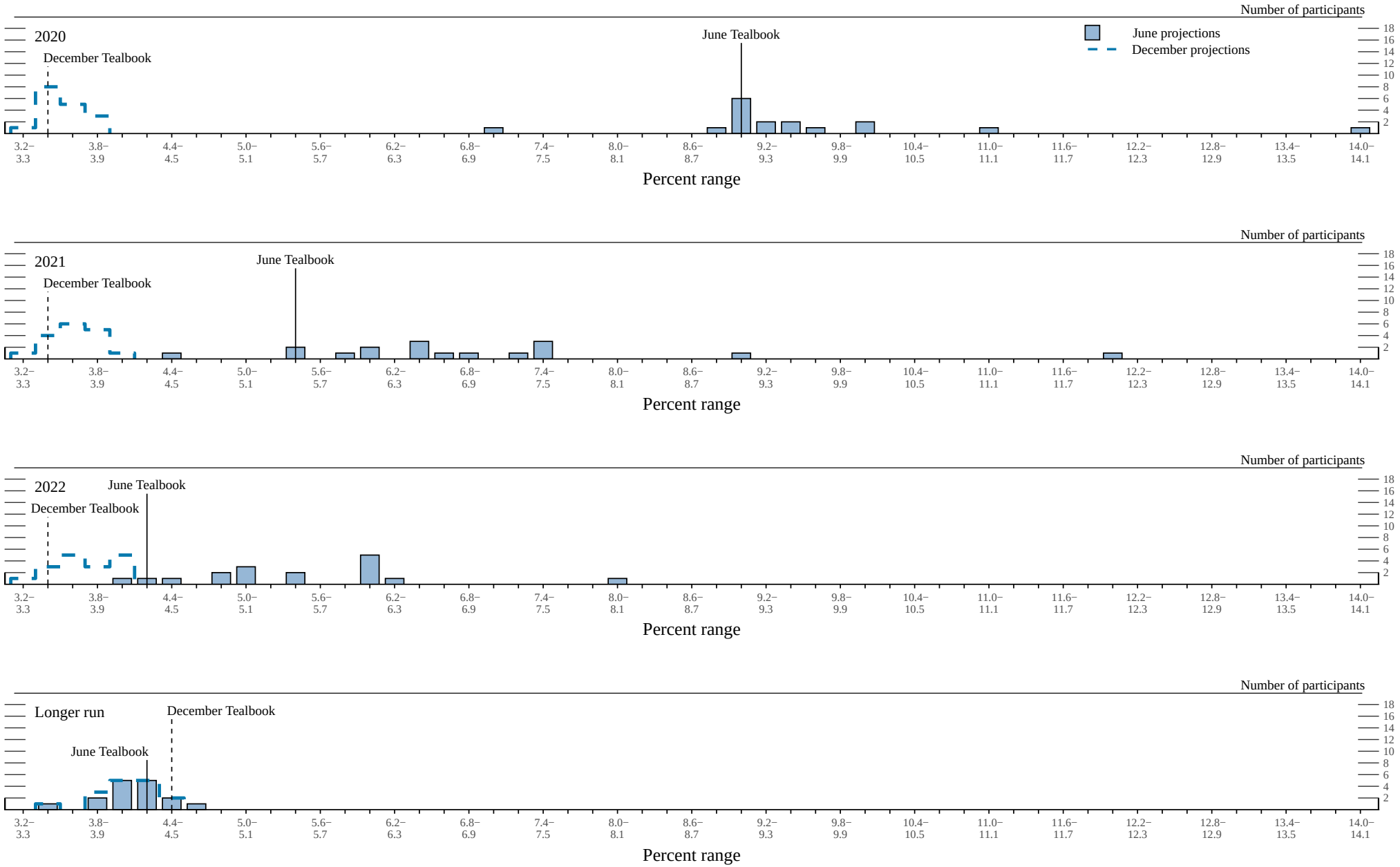
Respondent 17: N/A

Figure 3.A. Distribution of participants' projections for the change in real GDP, 2020–22 and over the longer run



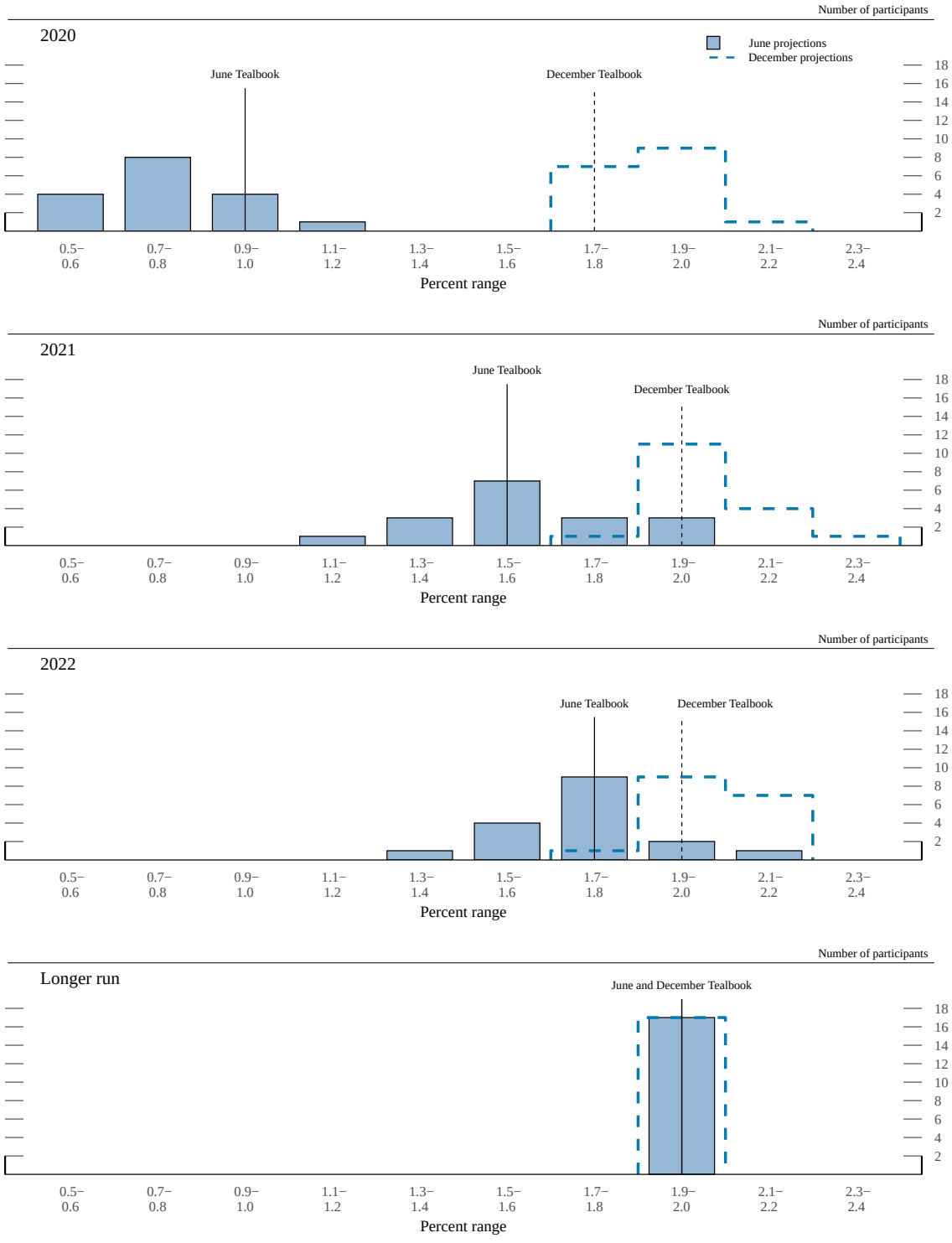
NOTE: Updated June Tealbook values are reported. Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2020–22 and over the longer run



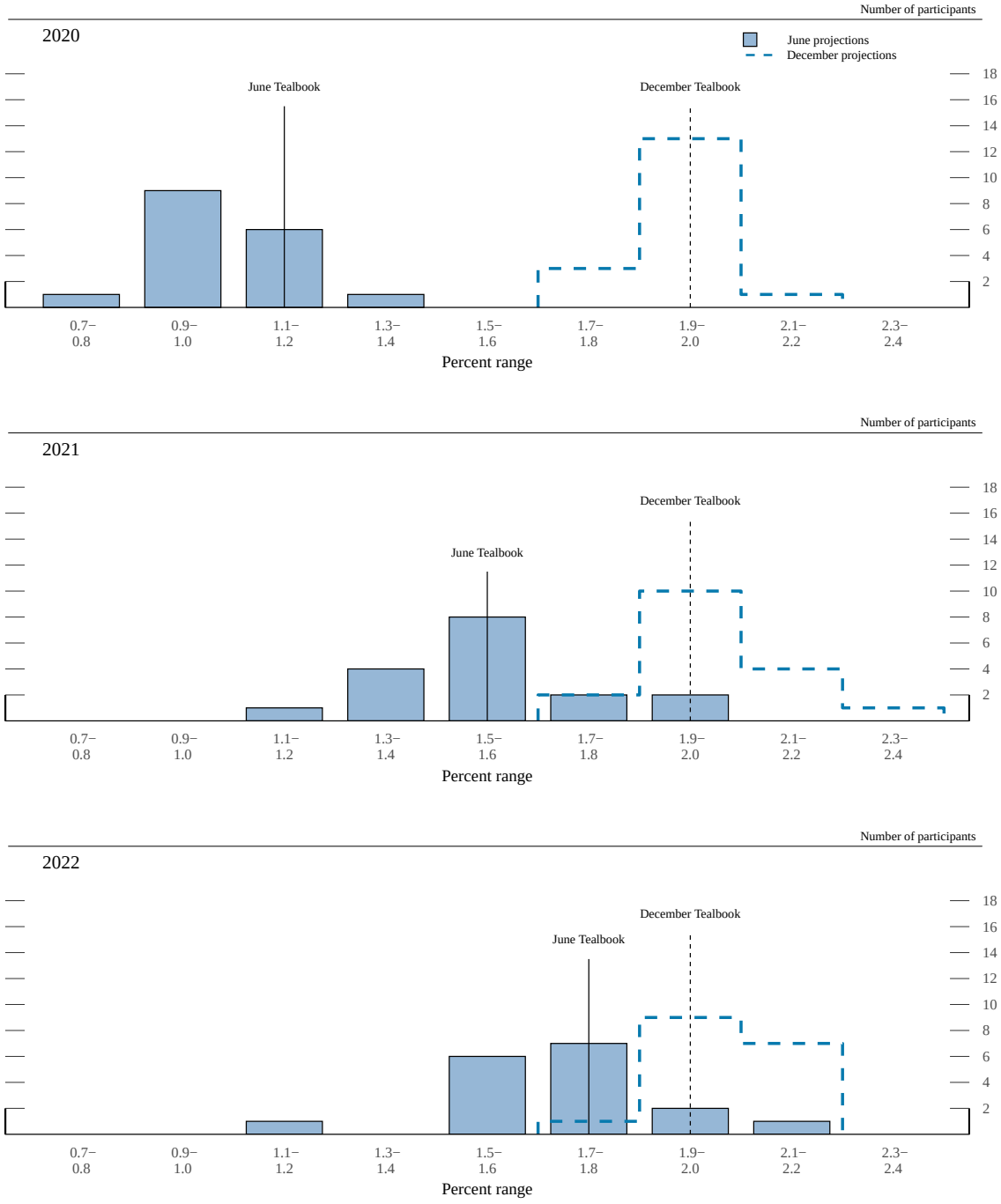
NOTE: Updated June Tealbook values are reported. Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2020–22 and over the longer run



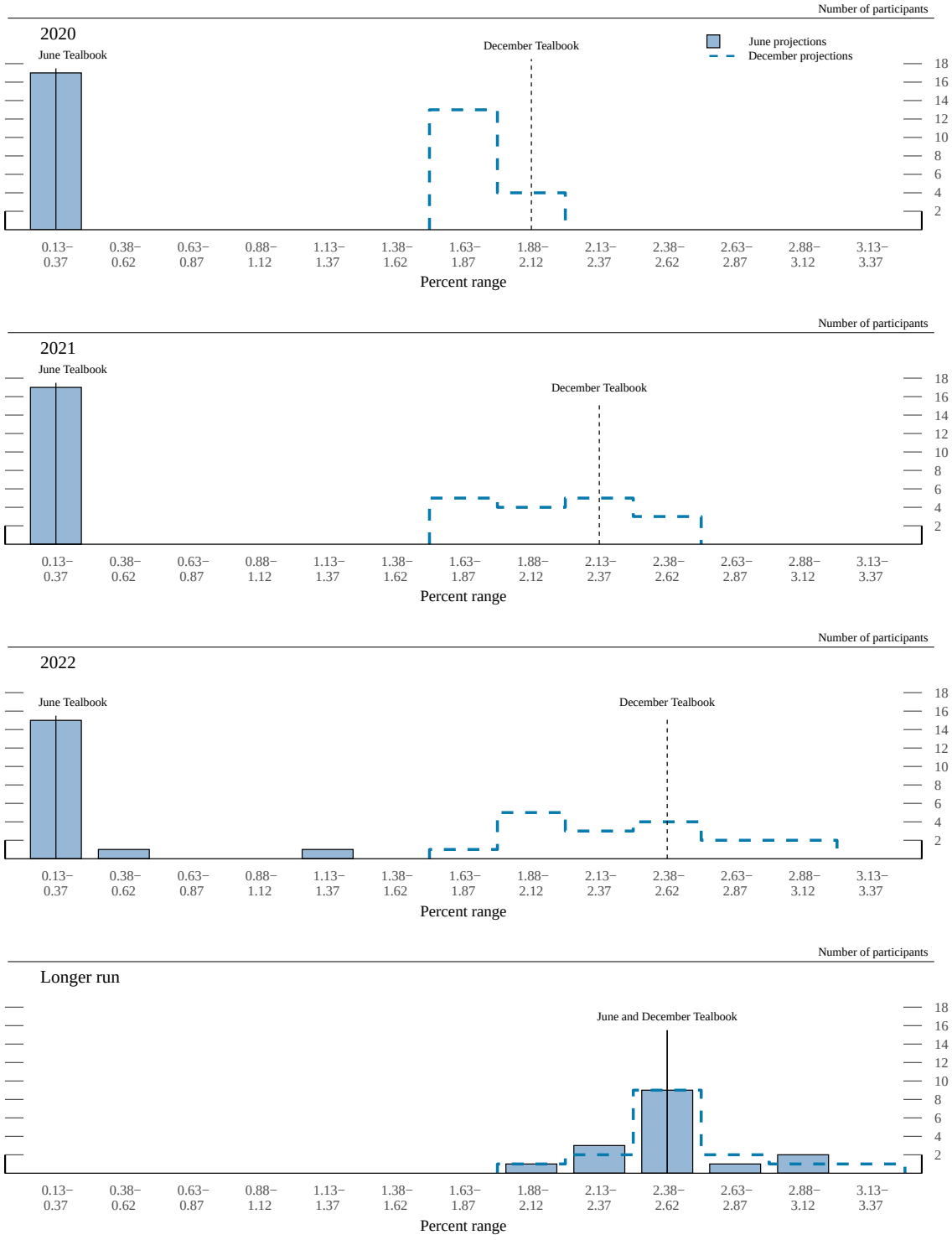
NOTE: Updated June Tealbook values are reported. Definitions of variables and other explanations are in the notes to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2020–22



NOTE: Updated June 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, 2020–22 and over the longer run



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