



# SURVEY OF PROFESSIONAL FORECASTERS

Release Date: February 14, 2020

## FIRST QUARTER 2020

### *Stronger Output Growth and Higher Job Gains in 2020*

The U.S. economy in 2020 looks stronger now than it did three months ago, according to 37 forecasters surveyed by the Federal Reserve Bank of Philadelphia. The panel predicts real GDP will grow at an annual rate of 1.7 percent this quarter, down from 1.9 percent in the last survey. However, for each of the next three quarters, the panel sees higher output growth than they predicted previously. On an annual-average over annual-average basis, the forecasters expect real GDP to grow 2.0 percent in each of the next four years. The current projection for 2020 growth is up from 1.8 percent in the last survey.

A brighter outlook for the labor market accompanies the outlook for growth. The forecasters predict the unemployment rate will average between 3.6 percent and 3.9 percent from 2020 to 2023. Notably, the projections for 2020, 2021, and 2022 are below those of the last survey.

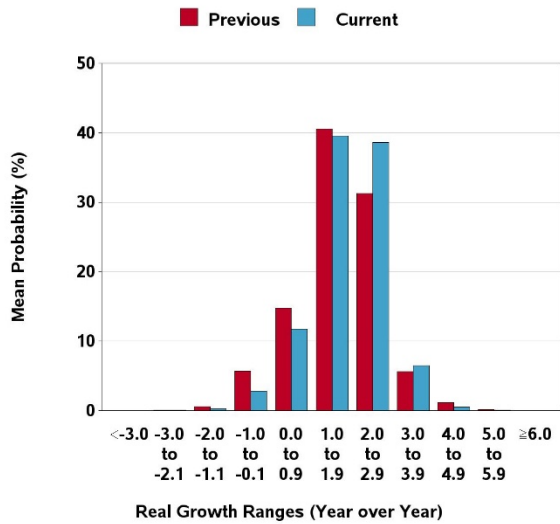
On the employment front, the forecasters have revised upward their estimates for job gains in 2020. The projections for the annual-average level of nonfarm payroll employment suggest job gains at a monthly rate of 168,500 in 2020, up from 143,800 projected three months ago. (These annual-average estimates are computed as the year-to-year change in the annual-average level of nonfarm payroll employment, converted to a monthly rate.)

### *Median Forecasts for Selected Variables in the Current and Previous Surveys*

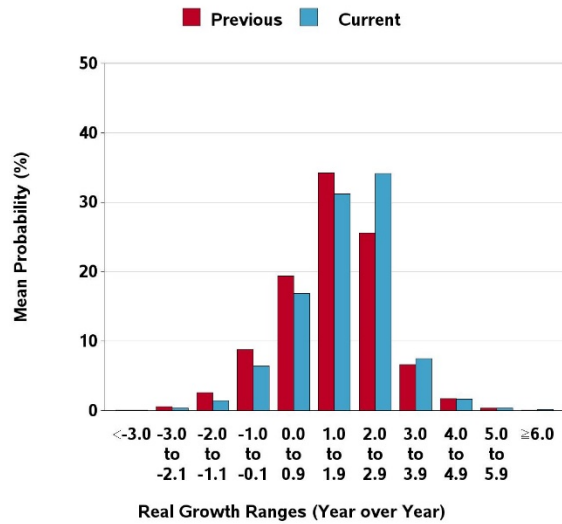
	Real GDP (%)		Unemployment Rate (%)		Payrolls (000s/month)	
	Previous	New	Previous	New	Previous	New
Quarterly data:						
2020:Q1	1.9	1.7	3.6	3.6	133.1	178.2
2020:Q2	1.7	2.1	3.6	3.5	159.4	168.6
2020:Q3	1.7	2.0	3.7	3.5	122.5	132.8
2020:Q4	1.9	2.1	3.7	3.6	127.3	116.7
2021:Q1	N.A.	2.2	N.A.	3.6	N.A.	114.5
Annual data (projections are based on annual-average levels):						
2020	1.8	2.0	3.7	3.6	143.8	168.5
2021	2.0	2.0	3.7	3.6	N.A.	125.2
2022	2.0	2.0	3.9	3.7	N.A.	N.A.
2023	N.A.	2.0	N.A.	3.9	N.A.	N.A.

The charts below provide some insight into the degree of uncertainty the forecasters have about their projections for the rate of growth in the annual-average level of real GDP. Each chart presents the forecasters' previous and current estimates of the probability that growth will fall into each of 11 ranges. The charts show the forecasters have revised upward their estimates of the probability that real GDP will grow 2.0 percent or more in 2020 and 2021.

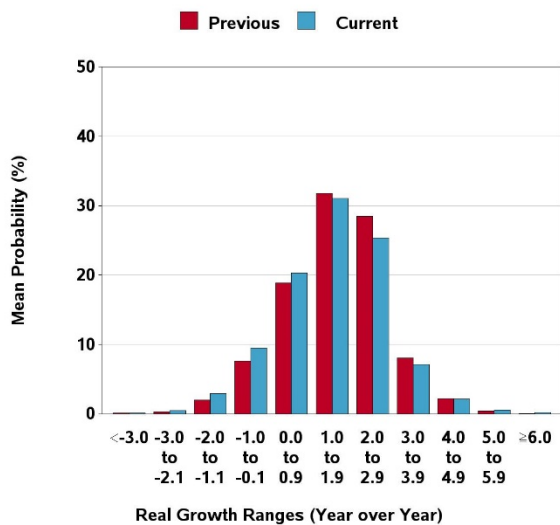
Mean Probabilities for Real GDP Growth in 2020



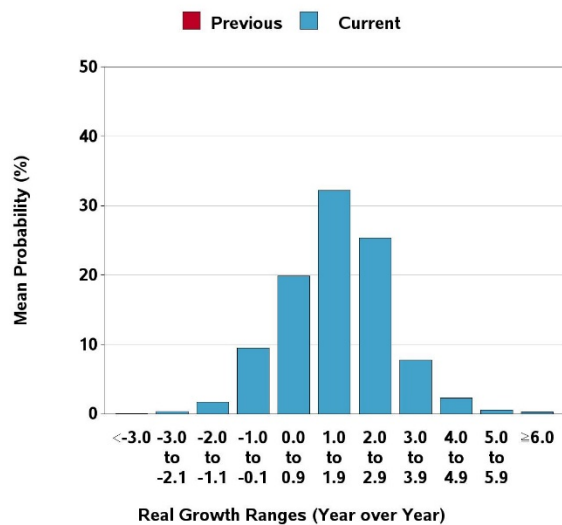
Mean Probabilities for Real GDP Growth in 2021



Mean Probabilities for Real GDP Growth in 2022

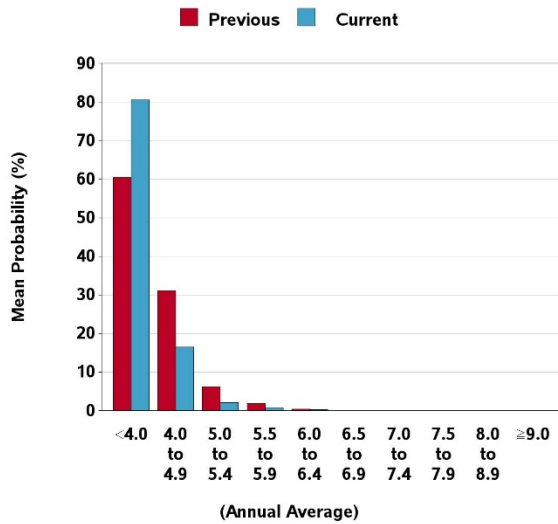


Mean Probabilities for Real GDP Growth in 2023

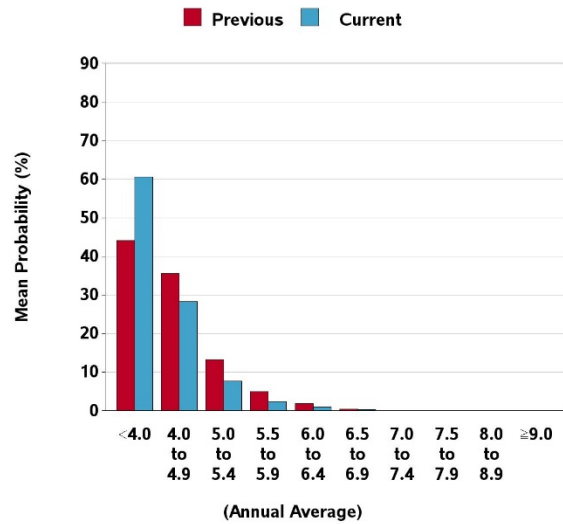


The forecasters' density projections for unemployment, shown below, shed light on uncertainty about the labor market over the next four years. Each chart presents the forecasters' current estimates of the probability that unemployment will fall into each of 10 ranges. The charts show the panelists are raising their density estimates for an unemployment rate below 4.0 percent for the next three years, especially in 2020 and 2021.

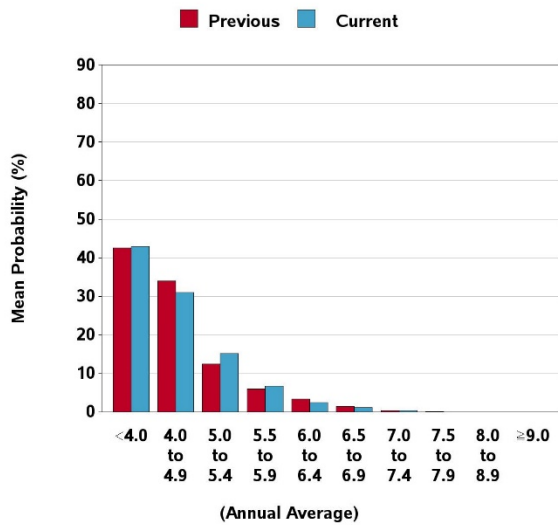
Mean Probabilities for Unemployment Rate in 2020



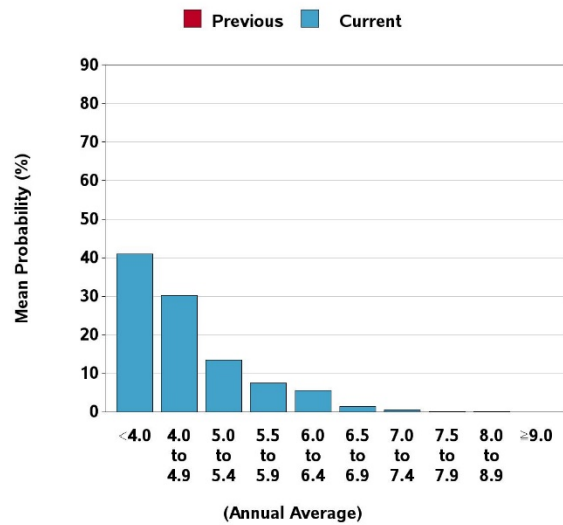
Mean Probabilities for Unemployment Rate in 2021



Mean Probabilities for Unemployment Rate in 2022



Mean Probabilities for Unemployment Rate in 2023



### ***Lower Inflation in the Current Quarter***

The forecasters expect current-quarter headline CPI inflation to average 2.0 percent, down from 2.2 percent in the last survey. Headline PCE inflation for the current quarter will be 1.7 percent, down 0.3 percentage point from the previous estimate.

The forecasters' projections for inflation beyond the current quarter are little changed compared with the previous survey.

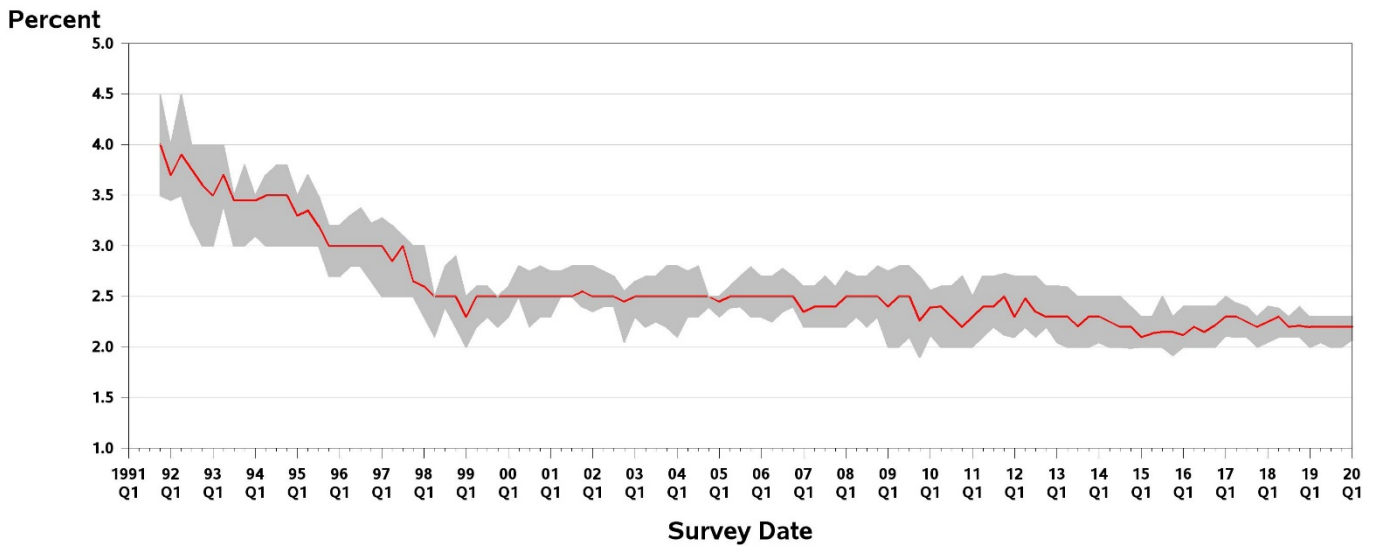
Over the next 10 years, 2020 to 2029, the forecasters expect headline CPI inflation to average 2.20 percent at an annual rate. The corresponding estimate for 10-year annual-average PCE inflation is 2.00 percent.

### *Median Short-Run and Long-Run Projections for Inflation (Annualized Percentage Points)*

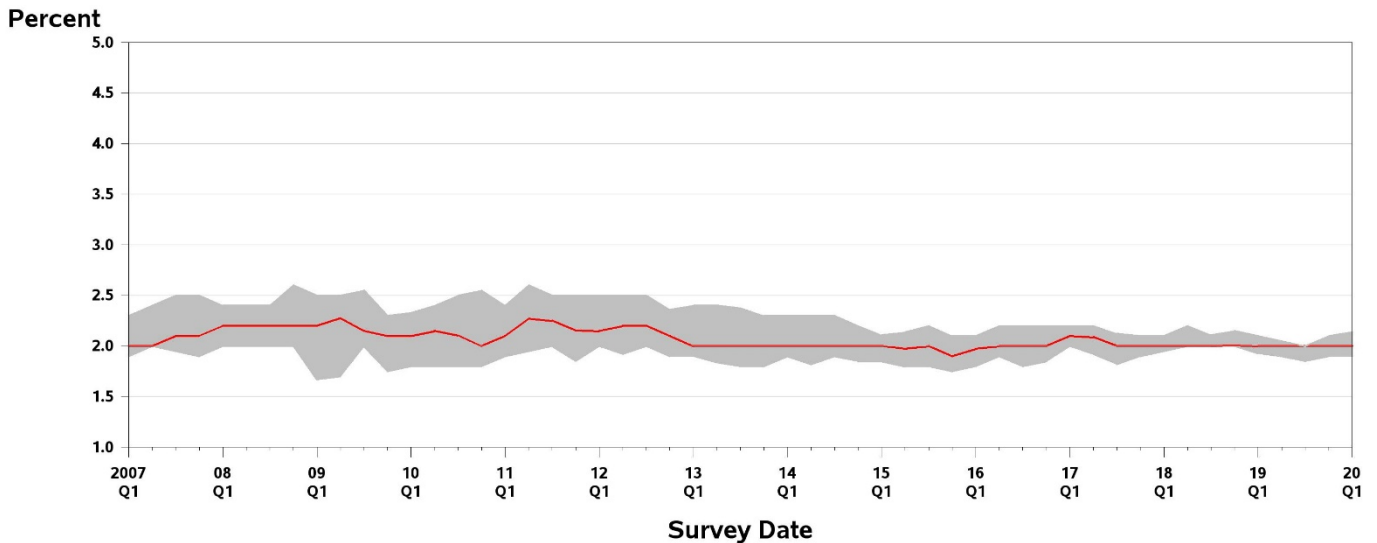
	Headline CPI		Core CPI		Headline PCE		Core PCE	
	Previous	Current	Previous	Current	Previous	Current	Previous	Current
<b>Quarterly</b>								
2020:Q1	2.2	2.0	2.3	2.1	2.0	1.7	2.0	1.9
2020:Q2	2.1	2.0	2.2	2.1	2.0	1.8	2.0	1.9
2020:Q3	2.2	2.2	2.2	2.1	1.9	1.9	2.0	1.9
2020:Q4	2.1	2.2	2.2	2.2	1.9	2.0	2.0	1.9
2021:Q1	N.A.	2.2	N.A.	2.2	N.A.	2.0	N.A.	1.9
<b>Q4/Q4 Annual Averages</b>								
2020	2.1	2.0	2.3	2.2	1.9	1.9	2.0	1.9
2021	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.9
2022	N.A.	2.3	N.A.	2.2	N.A.	2.0	N.A.	1.9
<b>Long-Term Annual Averages</b>								
2019-2023	2.20	N.A.	N.A.	N.A.	1.90	N.A.	N.A.	N.A.
2020-2024	N.A.	2.20	N.A.	N.A.	N.A.	2.00	N.A.	N.A.
2019-2028	2.20	N.A.	N.A.	N.A.	2.00	N.A.	N.A.	N.A.
2020-2029	N.A.	2.20	N.A.	N.A.	N.A.	2.00	N.A.	N.A.

The charts below show the median projections (the red line) and the associated interquartile ranges (gray areas around the red line) for the projections for 10-year annual-average CPI and PCE inflation. The charts highlight unchanged projections for the long-term inflation rate, compared with those of the last survey.

### Projections for the 10-Year Annual-Average Rate of CPI Inflation (Median and Interquartile Range)

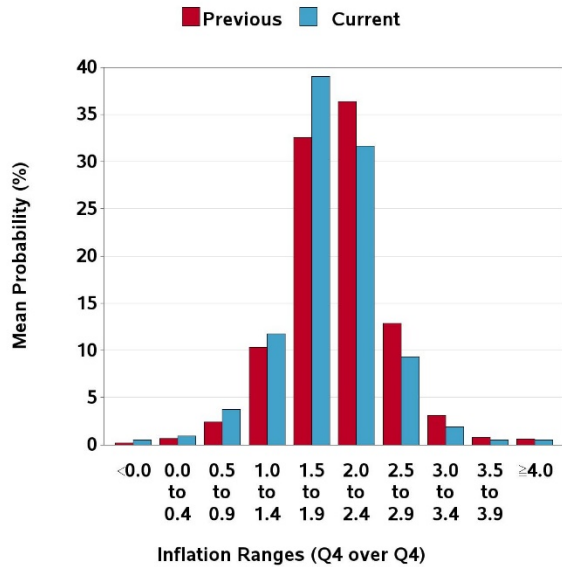


### Projections for the 10-Year Annual-Average Rate of PCE Inflation (Median and Interquartile Range)

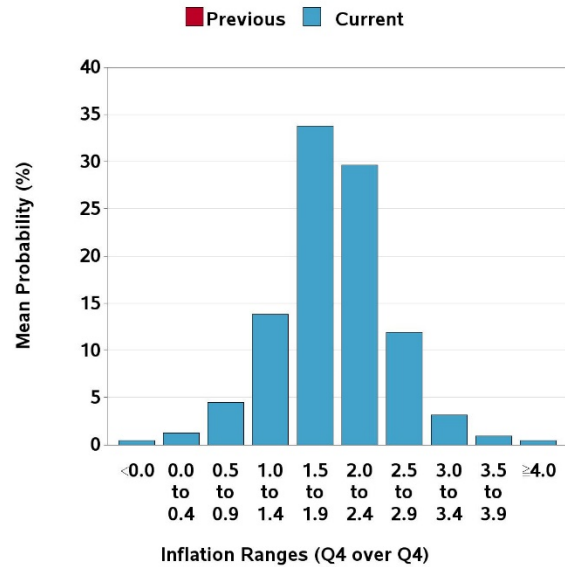


The figures below show the probabilities that the forecasters are assigning to each of 10 possible ranges for fourth-quarter over fourth-quarter core PCE inflation in 2020 and 2021. For 2020, the forecasters have increased the probability that core PCE inflation will be below 2.0 percent.

Mean Probabilities for Core PCE Inflation in 2020



Mean Probabilities for Core PCE Inflation in 2021



**Lower Risk of a Negative Quarter**

The forecasters have revised downward the chance of a contraction in real GDP in any of the next four quarters. For the current quarter, the forecasters predict a 12.5 percent chance of negative growth, down from 18.1 percent in the survey of three months ago.

*Risk of a Negative Quarter (%)*  
Survey Means

Quarterly data:	Previous	New
2020:Q1	18.1	12.5
2020:Q2	20.8	14.9
2020:Q3	22.6	18.4
2020:Q4	25.1	21.3
2021:Q1	N.A.	25.7

**Forecasters State Their Views on House Price Growth over the Next Two Years**

In a special question in this survey, panelists were asked to provide their forecasts for fourth-quarter over fourth-quarter growth in house prices, as measured by a number of alternative indices. The panelists were allowed to choose their measure from a list of indices or to write in their own index. For each index of their choosing, the panelists provided forecasts for growth in 2020 and 2021.

Sixteen panelists answered the special question. Some panelists provided projections for more than one index. The table below provides a summary of the forecasters’ responses. The number of responses (N) is low for each index. The median estimates for the six house-price indices listed in the table below range from 3.5 percent to 4.3 percent in 2020 and from 2.8 percent to 4.0 percent in 2021.

*Projections for Growth in Various Indices of House Prices  
Q4/Q4, Percentage Points*

Index	2020 (Q4/Q4 Percent Change)			2021 (Q4/Q4 Percent Change)		
	N	Mean	Median	N	Mean	Median
S&P CoreLogic Case-Shiller: U.S. National	5	4.2	4.2	5	3.7	3.4
S&P CoreLogic Case-Shiller: Composite 10	2	4.2	4.2	2	4.0	4.0
S&P CoreLogic Case-Shiller: Composite 20	5	3.5	3.5	5	3.3	2.8
FHFA: Purchase Only (U.S. Total)	10	4.1	4.1	10	3.9	3.9
CoreLogic: National HPI, incl. Distressed Sales (Single Family Combined)	4	4.2	4.3	4	3.8	3.8
NAR Median: Total Existing	2	3.8	3.8	2	3.7	3.7

**Stable 10-Year Growth in Output and Productivity and Lower Returns to Financial Assets**

In our first-quarter surveys, the forecasters provide their 10-year annual-average projections for an expanded set of variables, including growth in output and productivity, as well as returns on financial assets.

As the table below shows, the projection for the annual-average rate of growth in real GDP over the next 10 years is nearly unchanged. Currently, the forecasters expect real GDP to grow at an annual-average rate of 2.00 percent over the next 10 years, almost identical to their projection of 1.99 percent in the first-quarter survey of 2019. Ten-year annual-average productivity growth is now expected to be 1.40 percent, up slightly from 1.35 percent previously.

Downward revisions to the return on financial assets accompany the current outlook. The forecasters predict the S&P 500 returning an annual-average 5.00 percent over the next 10 years, down from 5.35 percent. The forecasters see the rate on 10-year Treasuries averaging 2.70 percent over the next 10 years, down from 3.50 percent in last year’s first-quarter survey. Three-month Treasury bills will return an annual-average 2.02 percent over the next 10 years, down from 2.75 percent.

*Median Long-Term (10-Year) Forecasts (%)*

	<i>First Quarter 2019</i>	<i>Current Survey</i>
<i>Real GDP Growth</i>	1.99	2.00
<i>Productivity Growth</i>	1.35	1.40
<i>Stock Returns (S&amp;P 500)</i>	5.35	5.00
<i>Rate on 10-Year Treasury Bonds</i>	3.50	2.70
<i>Bill Returns (3-Month)</i>	2.75	2.02

### *Technical Notes*

#### **Moody's Aaa and Baa Historical Rates**

The historical values of Moody's Aaa and Baa rates are proprietary and, therefore, not available in the data files on the Bank's website or on the tables that accompany the survey's complete write-up in the PDF.

The Federal Reserve Bank of Philadelphia thanks the following forecasters for their participation in recent surveys:

**Lewis Alexander**, Nomura Securities; **Scott Anderson**, Bank of the West (BNP Paribas Group); **Robert J. Barbera**, Johns Hopkins University Center for Financial Economics; **Peter Bernstein**, RCF Economic and Financial Consulting, Inc.; **Wayne Best** and **Michael Brown**, Visa, Inc.; **Jay Bryson**, Wells Fargo; **J. Burton**, **G. Ehrlich**, **D. Manaenkov**, **W. Song**, and **A. Thapar**, RSQE, University of Michigan; **Christine Chmura, Ph.D.**, and **Xiaobing Shuai, Ph.D.**, Chmura Economics & Analytics; **Gary Ciminero, CFA**, GLC Financial Economics; **Gregory Daco**, Oxford Economics USA, Inc.; **Rajeev Dhawan**, Georgia State University; **Bill Diviney**, ABN AMRO Bank NV; **Michael R. Englund**, Action Economics, LLC; **Michael Gapen**, Barclays Capital; **Sacha Gelfer**, Bentley University; **James Glassman**, JPMorgan Chase & Co.; **Jan Hatzius**, Goldman Sachs; **Brian Higginbotham**, U.S. Chamber of Commerce; **Peter Hooper**, Deutsche Bank Securities, Inc.; **Fred Joutz**, Benchmark Forecasts; **Sam Kahan**, Kahan Consulting Ltd. (ACT Research LLC); **N. Karp**, BBVA Research USA; **Walter Kemmsies**, Jones Lang LaSalle; **Jack Kleinhenz**, Kleinhenz & Associates, Inc.; **Thomas Lam**, Sim Kee Boon Institute, Singapore Management University; **John Lonski**, Moody's Capital Markets Group; **IHS Markit**; **Robert McNab**, Old Dominion University; **R. Anthony Metz**, Pareto Optimal Economics; **R. M. Monaco**, TitanRM; **Michael Moran**, Daiwa Capital Markets America; **Joel L. Naroff**, Naroff Economic Advisors; **Mark Nielson, Ph.D.**, MacroEcon Global Advisors; **Brendon Ogmundson**, BC Real Estate Association; **Philip Rothman**, East Carolina University; **Chris Rupkey**, MUFG Union Bank; **Sean M. Snaith, Ph.D.**, University of Central Florida; **Constantine G. Soras, Ph.D.**, CGS Economic Consulting/Montclair State University; **Stephen Stanley**, Amherst Pierpont Securities; **Charles Steindel**, Ramapo College of New Jersey; **Susan M. Sterne**, Economic Analysis Associates, Inc.; **James Sweeney**, Credit Suisse; **Thomas Kevin Swift**, American Chemistry Council; **Maira Trimble**, Eaton Corporation; **Mark Zandi**, Moody's Analytics; **Ellen Zentner**, Morgan Stanley.

This is a partial list of participants. We also thank those who wish to remain anonymous.



SUMMARY TABLE  
SURVEY OF PROFESSIONAL FORECASTERS  
MAJOR MACROECONOMIC INDICATORS

	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2020	2021 (YEAR-OVER-YEAR)	2022	2023
PERCENT GROWTH AT ANNUAL RATES									
1. REAL GDP (BILLIONS, CHAIN WEIGHTED)	1.7	2.1	2.0	2.1	2.2	2.0	2.0	2.0	2.0
2. GDP PRICE INDEX (PERCENT CHANGE)	1.8	1.8	1.9	2.0	2.0	1.8	1.9	N.A.	N.A.
3. NOMINAL GDP (\$ BILLIONS)	3.4	4.2	4.2	4.1	3.7	3.9	4.0	N.A.	N.A.
4. NONFARM PAYROLL EMPLOYMENT (PERCENT CHANGE)	1.4	1.3	1.0	0.9	0.9	1.3	1.0	N.A.	N.A.
(AVG MONTHLY CHANGE)	178.2	168.6	132.8	116.7	114.5	168.5	125.2	N.A.	N.A.
VARIABLES IN LEVELS									
5. UNEMPLOYMENT RATE (PERCENT)	3.6	3.5	3.5	3.6	3.6	3.6	3.6	3.7	3.9
6. 3-MONTH TREASURY BILL (PERCENT)	1.6	1.6	1.6	1.6	1.6	1.6	1.7	2.0	2.2
7. 10-YEAR TREASURY BOND (PERCENT)	1.7	1.8	1.9	2.0	2.0	1.9	2.1	2.5	2.7
	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2020	2021 (Q4-OVER-Q4)	2022	
INFLATION INDICATORS									
8. CPI (ANNUAL RATE)	2.0	2.0	2.2	2.2	2.2	2.0	2.2	2.3	
9. CORE CPI (ANNUAL RATE)	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.2	
10. PCE (ANNUAL RATE)	1.7	1.8	1.9	2.0	2.0	1.9	2.0	2.0	
11. CORE PCE (ANNUAL RATE)	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	

Note: The figures on each line are medians of 37 forecasters.

Source: Research Department, Federal Reserve Bank of Philadelphia.  
Survey of Professional Forecasters, First Quarter 2020.

## **SURVEY OF PROFESSIONAL FORECASTERS**

**First Quarter 2020**

**Tables**

Note: Data in these tables listed as "actual" are the data that were available to the forecasters when they were sent the survey questionnaire on January 30, 2020; the tables do not reflect subsequent revisions to the data. All forecasts were received on or before February 11, 2020.

TABLE ONE  
MAJOR MACROECONOMIC INDICATORS  
MEDIAN OF FORECASTER PREDICTIONS

	NUMBER OF FORECASTERS	ACTUAL		FORECAST				ACTUAL		FORECAST		
		2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2019 ANNUAL	2020 ANNUAL	2021 ANNUAL	2022 ANNUAL	2023 ANNUAL
1. GROSS DOMESTIC PRODUCT (GDP) (\$ BILLIONS)	37	21734	21919	22144	22372	22599	22804	21429	22259	23149	N.A.	N.A.
2. GDP PRICE INDEX (2012=100)	36	113.08	113.58	114.10	114.64	115.20	115.77	112.36	114.38	116.57	N.A.	N.A.
3. CORPORATE PROFITS AFTER TAXES (\$ BILLIONS)	20	N.A.	1885.6	1910.2	1921.5	1923.0	1927.6	N.A.	1901.1	1972.1	N.A.	N.A.
4. UNEMPLOYMENT RATE (PERCENT)	36	3.5	3.6	3.5	3.5	3.6	3.6	3.7	3.6	3.6	3.7	3.9
5. NONFARM PAYROLL EMPLOYMENT (THOUSANDS)	34	152201	152736	153242	153640	153990	154333	151404	153426	154928	N.A.	N.A.
6. INDUSTRIAL PRODUCTION (2012=100)	31	109.4	109.4	109.8	110.2	110.5	110.7	109.5	110.0	111.4	N.A.	N.A.
7. NEW PRIVATE HOUSING STARTS (ANNUAL RATE, MILLIONS)	33	1.44	1.37	1.38	1.38	1.37	1.39	1.30	1.38	1.38	N.A.	N.A.
8. 3-MONTH TREASURY BILL RATE (PERCENT)	35	1.58	1.56	1.57	1.59	1.60	1.60	2.06	1.58	1.66	1.96	2.18
9. MOODY'S AAA CORP BOND YIELD * (PERCENT)	26	N.A.	2.97	3.05	3.10	3.12	3.19	N.A.	3.07	3.38	N.A.	N.A.
10. MOODY'S BAA CORP BOND YIELD * (PERCENT)	27	N.A.	3.86	3.92	3.98	4.08	4.15	N.A.	3.95	4.30	N.A.	N.A.
11. 10-YEAR TREASURY BOND YIELD (PERCENT)	36	1.79	1.74	1.81	1.92	1.97	2.02	2.14	1.87	2.10	2.50	2.65
12. REAL GDP (BILLIONS, CHAIN WEIGHTED)	36	19220	19299	19400	19497	19600	19707	19073	19451	19834	20235	20648
13. TOTAL CONSUMPTION EXPENDITURE (BILLIONS, CHAIN WEIGHTED)	34	13411.9	13485.2	13554.9	13626.8	13692.1	13764.3	13279.6	13591.8	13875.4	N.A.	N.A.
14. NONRESIDENTIAL FIXED INVESTMENT (BILLIONS, CHAIN WEIGHTED)	32	2732.4	2737.0	2750.9	2769.5	2783.7	2802.4	2749.8	2763.9	2841.3	N.A.	N.A.
15. RESIDENTIAL FIXED INVESTMENT (BILLIONS, CHAIN WEIGHTED)	33	602.1	608.0	611.1	614.3	617.5	621.9	593.6	612.6	625.4	N.A.	N.A.
16. FEDERAL GOVERNMENT C & I (BILLIONS, CHAIN WEIGHTED)	33	1295.7	1302.3	1309.9	1315.4	1321.8	1324.9	1275.7	1311.8	1333.4	N.A.	N.A.
17. STATE AND LOCAL GOVT C & I (BILLIONS, CHAIN WEIGHTED)	34	2035.8	2042.3	2049.1	2055.5	2061.9	2068.1	2022.5	2053.1	2077.6	N.A.	N.A.
18. CHANGE IN PRIVATE INVENTORIES (BILLIONS, CHAIN WEIGHTED)	32	6.5	20.3	27.5	32.0	38.6	39.6	65.3	29.0	45.6	N.A.	N.A.
19. NET EXPORTS (BILLIONS, CHAIN WEIGHTED)	33	-902.0	-918.7	-927.6	-942.5	-955.7	-960.0	-954.2	-934.4	-975.9	N.A.	N.A.

\* The historical values of Moody's Aaa and Baa rates are proprietary and therefore not available to the general public.

Source: Research Department, Federal Reserve Bank of Philadelphia. Survey of Professional Forecasters, First Quarter 2020.

TABLE TWO  
MAJOR MACROECONOMIC INDICATORS  
PERCENTAGE CHANGES AT ANNUAL RATES

	NUMBER OF FORECASTERS	Q4 2019 TO Q1 2020	Q1 2020 TO Q2 2020	Q2 2020 TO Q3 2020	Q3 2020 TO Q4 2020	Q4 2020 TO Q1 2021	2019 TO 2020	2020 TO 2021	2021 TO 2022	2022 TO 2023
1. GROSS DOMESTIC PRODUCT (GDP) (\$ BILLIONS)	37	3.4	4.2	4.2	4.1	3.7	3.9	4.0	N.A.	N.A.
2. GDP PRICE INDEX (2012=100)	36	1.8	1.8	1.9	2.0	2.0	1.8	1.9	N.A.	N.A.
3. CORPORATE PROFITS AFTER TAXES (\$ BILLIONS)	20	1.6	5.3	2.4	0.3	1.0	2.9	3.7	N.A.	N.A.
4. UNEMPLOYMENT RATE (PERCENT)	36	0.1	-0.0	0.0	0.0	0.0	-0.1	0.0	0.1	0.2
5. NONFARM PAYROLL EMPLOYMENT (PERCENT CHANGE) (AVG MONTHLY CHANGE)	34 34	1.4 178.2	1.3 168.6	1.0 132.8	0.9 116.7	0.9 114.5	1.3 168.5	1.0 125.2	N.A. N.A.	N.A. N.A.
6. INDUSTRIAL PRODUCTION (2012=100)	31	-0.1	1.4	1.6	1.0	0.9	0.5	1.2	N.A.	N.A.
7. NEW PRIVATE HOUSING STARTS (ANNUAL RATE, MILLIONS)	33	-18.6	2.1	0.2	-0.9	5.6	5.9	0.3	N.A.	N.A.
8. 3-MONTH TREASURY BILL RATE (PERCENT)	35	-0.02	0.01	0.02	0.01	0.00	-0.48	0.08	0.30	0.22
9. MOODY'S AAA CORP BOND YIELD * (PERCENT)	26	N.A.	0.09	0.04	0.03	0.06	N.A.	0.32	N.A.	N.A.
10. MOODY'S BAA CORP BOND YIELD * (PERCENT)	27	N.A.	0.06	0.06	0.10	0.07	N.A.	0.35	N.A.	N.A.
11. 10-YEAR TREASURY BOND YIELD (PERCENT)	36	-0.05	0.07	0.11	0.05	0.06	-0.27	0.23	0.40	0.15
12. REAL GDP (BILLIONS, CHAIN WEIGHTED)	36	1.7	2.1	2.0	2.1	2.2	2.0	2.0	2.0	2.0
13. TOTAL CONSUMPTION EXPENDITURE (BILLIONS, CHAIN WEIGHTED)	34	2.2	2.1	2.1	1.9	2.1	2.4	2.1	N.A.	N.A.
14. NONRESIDENTIAL FIXED INVESTMENT (BILLIONS, CHAIN WEIGHTED)	32	0.7	2.0	2.7	2.1	2.7	0.5	2.8	N.A.	N.A.
15. RESIDENTIAL FIXED INVESTMENT (BILLIONS, CHAIN WEIGHTED)	33	4.0	2.0	2.2	2.1	2.8	3.2	2.1	N.A.	N.A.
16. FEDERAL GOVERNMENT C & I (BILLIONS, CHAIN WEIGHTED)	33	2.1	2.3	1.7	2.0	0.9	2.8	1.6	N.A.	N.A.
17. STATE AND LOCAL GOVT C & I (BILLIONS, CHAIN WEIGHTED)	34	1.3	1.3	1.3	1.2	1.2	1.5	1.2	N.A.	N.A.
18. CHANGE IN PRIVATE INVENTORIES (BILLIONS, CHAIN WEIGHTED)	32	13.8	7.2	4.5	6.6	1.0	-36.3	16.6	N.A.	N.A.
19. NET EXPORTS (BILLIONS, CHAIN WEIGHTED)	33	-16.7	-8.9	-14.9	-13.2	-4.3	19.8	-41.5	N.A.	N.A.

\* The historical values of Moody's Aaa and Baa rates are proprietary and therefore not available to the general public.

Note: Figures for unemployment rate, 3-month Treasury bill rate, Moody's Aaa corporate bond yield, Moody's Baa corporate bond yield, and 10-year Treasury bond yield are changes in these rates, in percentage points. Figures for change in private inventories and net exports are changes in billions of chain-weighted dollars. All others are percentage changes at annual rates.

Source: Research Department, Federal Reserve Bank of Philadelphia. Survey of Professional Forecasters, First Quarter 2020.

TABLE THREE  
 MAJOR PRICE INDICATORS  
 MEDIANS OF FORECASTER PREDICTIONS

	NUMBER OF FORECASTERS	ACTUAL		FORECAST (Q/Q)				ACTUAL				FORECAST (Q4/Q4)			
		2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2019 ANNUAL	2020 ANNUAL	2021 ANNUAL	2022 ANNUAL				
1. CONSUMER PRICE INDEX (ANNUAL RATE)	35	2.6	2.0	2.0	2.2	2.2	2.2	2.0	2.0	2.2	2.3				
2. CORE CONSUMER PRICE INDEX (ANNUAL RATE)	35	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.2	2.1	2.2				
3. PCE PRICE INDEX (ANNUAL RATE)	35	1.6	1.7	1.8	1.9	2.0	2.0	1.5	1.9	2.0	2.0				
4. CORE PCE PRICE INDEX (ANNUAL RATE)	35	1.3	1.9	1.9	1.9	1.9	1.9	1.6	1.9	1.9	1.9				

Source: Research Department, Federal Reserve Bank of Philadelphia. Survey of Professional Forecasters, First Quarter 2020.

TABLE FOUR  
YIELD SPREADS  
MEDIAN OF FORECASTER PREDICTIONS

	NUMBER OF FORECASTERS	ACTUAL		FORECAST				ACTUAL		FORECAST		
		2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2019 ANNUAL	2020 ANNUAL	2021 ANNUAL	2022 ANNUAL	2023 ANNUAL
1. TBOND MINUS TBILL (PERCENTAGE POINTS)	34	0.22	0.15	0.26	0.35	0.38	0.44	0.08	0.30	0.50	0.52	0.44
2. AAA MINUS TBOND (PERCENTAGE POINTS)	26	N.A.	1.22	1.21	1.23	1.20	1.20	N.A.	1.23	1.22	N.A.	N.A.
3. BAA MINUS TBOND (PERCENTAGE POINTS)	27	N.A.	2.08	2.08	2.07	2.10	2.10	N.A.	2.09	2.15	N.A.	N.A.
4. BAA MINUS AAA (PERCENTAGE POINTS)	26	N.A.	0.89	0.90	0.92	0.95	0.96	N.A.	0.91	0.98	N.A.	N.A.

Notes:

TBOND is the rate on 10-year Treasury bonds.  
TBILL is the rate on 3-month Treasury bills.  
AAA is the rate on Moody's Aaa corporate bonds.  
BAA is the rate on Moody's Baa corporate bonds.

The historical values for interest rate spreads for Moody's Aaa and Baa rates are proprietary and therefore not available to the general public.

Each interest rate spread is computed as the median value of the forecasters' spreads. These median values may differ from those computed as the difference between the median values of each interest rate in the spread.

Source: Research Department, Federal Reserve Bank of Philadelphia. Survey of Professional Forecasters, First Quarter 2020.

TABLE FIVE  
ESTIMATED PROBABILITY OF DECLINE IN REAL GDP

ESTIMATED PROBABILITY (CHANCES IN 100)	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020
	TO Q1 2020	TO Q2 2020	TO Q3 2020	TO Q4 2020	TO Q1 2021

NUMBER OF FORECASTERS

10 OR LESS	16	13	6	3	0
11 TO 20	7	11	10	11	10
21 TO 30	5	4	12	11	12
31 TO 40	1	0	1	4	6
41 TO 50	0	1	0	0	1
51 TO 60	0	0	0	0	0
61 TO 70	0	0	0	0	0
71 TO 80	0	0	0	0	0
81 TO 90	0	0	0	0	0
91 AND OVER	0	0	0	0	0
NOT REPORTING	8	8	8	8	8

MEAN AND MEDIAN

MEDIAN PROBABILITY	10.00	14.60	19.00	21.00	25.00
MEAN PROBABILITY	12.54	14.88	18.36	21.28	25.68

Note: Total number of forecasters reporting is 29.

Source: Research Department, Federal Reserve Bank of Philadelphia.  
Survey of Professional Forecasters, First Quarter 2020.

TABLE SIX  
MEAN PROBABILITIES

MEAN PROBABILITY ATTACHED TO POSSIBLE  
CIVILIAN UNEMPLOYMENT RATES:  
(ANNUAL AVERAGE)

	2020	2021	2022	2023
9.0 PERCENT OR MORE	0.00	0.00	0.00	0.02
8.0 TO 8.9 PERCENT	0.00	0.01	0.02	0.09
7.5 TO 7.9 PERCENT	0.00	0.01	0.04	0.16
7.0 TO 7.4 PERCENT	0.00	0.03	0.41	0.45
6.5 TO 6.9 PERCENT	0.00	0.30	1.19	1.44
6.0 TO 6.4 PERCENT	0.25	0.95	2.51	5.57
5.5 TO 5.9 PERCENT	0.65	2.31	6.73	7.47
5.0 TO 5.4 PERCENT	2.02	7.63	15.11	13.53
4.0 TO 4.9 PERCENT	16.48	28.23	30.99	30.26
LESS THAN 4.0 PERCENT	80.59	60.52	42.99	41.03

MEAN PROBABILITY ATTACHED TO POSSIBLE  
PERCENT CHANGES IN REAL GDP:  
(ANNUAL-AVERAGE OVER ANNUAL-AVERAGE)

	2019-2020	2020-2021	2021-2022	2022-2023
6.0 PERCENT OR MORE	0.00	0.12	0.18	0.27
5.0 TO 5.9 PERCENT	0.06	0.36	0.57	0.56
4.0 TO 4.9 PERCENT	0.52	1.64	2.17	2.27
3.0 TO 3.9 PERCENT	6.50	7.46	7.14	7.80
2.0 TO 2.9 PERCENT	38.60	34.13	25.39	25.38
1.0 TO 1.9 PERCENT	39.53	31.23	31.09	32.22
0.0 TO 0.9 PERCENT	11.73	16.83	20.34	19.87
-1.0 TO -0.1 PERCENT	2.78	6.39	9.50	9.53
-2.0 TO -1.1 PERCENT	0.25	1.44	2.95	1.69
-3.0 TO -2.1 PERCENT	0.03	0.34	0.52	0.36
LESS THAN -3.0 PERCENT	0.00	0.07	0.14	0.06

MEAN PROBABILITY ATTACHED TO POSSIBLE  
PERCENT CHANGES IN GDP PRICE INDEX:  
(ANNUAL-AVERAGE OVER ANNUAL-AVERAGE)

	2019-2020	2020-2021
4.0 PERCENT OR MORE	0.02	0.60
3.5 TO 3.9 PERCENT	0.18	1.32
3.0 TO 3.4 PERCENT	2.45	4.19
2.5 TO 2.9 PERCENT	11.38	11.52
2.0 TO 2.4 PERCENT	28.23	29.59
1.5 TO 1.9 PERCENT	38.72	32.24
1.0 TO 1.4 PERCENT	14.72	13.49
0.5 TO 0.9 PERCENT	3.16	4.47
0.0 TO 0.4 PERCENT	0.89	1.52
LESS THAN 0.0 PERCENT	0.25	1.05

Source: Research Department, Federal Reserve Bank of Philadelphia.  
Survey of Professional Forecasters, First Quarter 2020.



TABLE SEVEN  
 MEAN PROBABILITY OF CORE CPI AND CORE PCE INFLATION (Q4/Q4)

MEAN PROBABILITY ATTACHED TO CORE CPI INFLATION:

	19Q4 TO 20Q4	20Q4 TO 21Q4
4.0 PERCENT OR MORE	0.08	0.93
3.5 TO 3.9 PERCENT	0.59	2.16
3.0 TO 3.4 PERCENT	4.83	5.89
2.5 TO 2.9 PERCENT	20.38	18.39
2.0 TO 2.4 PERCENT	41.04	32.88
1.5 TO 1.9 PERCENT	25.42	27.61
1.0 TO 1.4 PERCENT	5.85	8.95
0.5 TO 0.9 PERCENT	1.60	2.54
0.0 TO 0.4 PERCENT	0.19	0.44
LESS THAN 0.0 PERCENT	0.02	0.23

MEAN PROBABILITY ATTACHED TO CORE PCE INFLATION:

	19Q4 TO 20Q4	20Q4 TO 21Q4
4.0 PERCENT OR MORE	0.53	0.46
3.5 TO 3.9 PERCENT	0.54	0.94
3.0 TO 3.4 PERCENT	1.90	3.18
2.5 TO 2.9 PERCENT	9.34	11.94
2.0 TO 2.4 PERCENT	31.65	29.66
1.5 TO 1.9 PERCENT	39.01	33.78
1.0 TO 1.4 PERCENT	11.77	13.85
0.5 TO 0.9 PERCENT	3.77	4.48
0.0 TO 0.4 PERCENT	0.95	1.24
LESS THAN 0.0 PERCENT	0.54	0.48

Source: Research Department, Federal Reserve Bank of Philadelphia.  
 Survey of Professional Forecasters, First Quarter 2020.

TABLE EIGHT  
LONG-TERM (5-YEAR AND 10-YEAR) INFLATION FORECASTS

ANNUAL AVERAGE OVER THE NEXT 5 YEARS: 2020-2024  
=====

CPI INFLATION RATE		PCE INFLATION RATE	
-----		-----	
MINIMUM	1.90	MINIMUM	1.69
LOWER QUARTILE	2.10	LOWER QUARTILE	1.87
MEDIAN	2.20	MEDIAN	2.00
UPPER QUARTILE	2.29	UPPER QUARTILE	2.04
MAXIMUM	2.90	MAXIMUM	2.40
MEAN	2.22	MEAN	1.99
STD. DEVIATION	0.23	STD. DEVIATION	0.17
N	28	N	28
MISSING	9	MISSING	9

ANNUAL AVERAGE OVER THE FOLLOWING 5 YEARS: 2025-2029  
=====

CPI INFLATION RATE		PCE INFLATION RATE	
-----		-----	
MINIMUM	1.90	MINIMUM	1.60
LOWER QUARTILE	2.01	LOWER QUARTILE	2.00
MEDIAN	2.23	MEDIAN	2.00
UPPER QUARTILE	2.38	UPPER QUARTILE	2.20
MAXIMUM	3.50	MAXIMUM	2.90
MEAN	2.25	MEAN	2.05
STD. DEVIATION	0.31	STD. DEVIATION	0.26
N	28	N	28
MISSING	9	MISSING	9

ANNUAL AVERAGE OVER THE NEXT 10 YEARS: 2020-2029  
=====

CPI INFLATION RATE		PCE INFLATION RATE	
-----		-----	
MINIMUM	1.90	MINIMUM	1.76
LOWER QUARTILE	2.07	LOWER QUARTILE	1.90
MEDIAN	2.20	MEDIAN	2.00
UPPER QUARTILE	2.30	UPPER QUARTILE	2.14
MAXIMUM	3.20	MAXIMUM	2.60
MEAN	2.23	MEAN	2.02
STD. DEVIATION	0.26	STD. DEVIATION	0.19
N	28	N	28
MISSING	9	MISSING	9

Note: The summary statistics for each forecast horizon are computed on a sample of panelists that may differ from one horizon to the next. The usual identity linking the 10-year horizon to the two underlying five-year horizons may not hold in the results.

Source: Research Department, Federal Reserve Bank of Philadelphia.  
Survey of Professional Forecasters, First Quarter 2020.

TABLE NINE  
 ADDITIONAL LONG-TERM (10-YEAR) FORECASTS

ANNUAL AVERAGE OVER THE NEXT 10 YEARS: 2020-2029  
 =====

REAL GDP GROWTH RATE		PRODUCTIVITY GROWTH RATE			
-----		-----			
MINIMUM	1.50	MINIMUM	1.00		
LOWER QUARTILE	1.80	LOWER QUARTILE	1.38		
MEDIAN	2.00	MEDIAN	1.40		
UPPER QUARTILE	2.20	UPPER QUARTILE	1.70		
MAXIMUM	2.65	MAXIMUM	2.50		
MEAN	2.03	MEAN	1.54		
STD. DEVIATION	0.27	STD. DEVIATION	0.34		
N	27	N	22		
MISSING	10	MISSING	15		
STOCK RETURNS (S&P 500)		BOND RATE (10-YEAR)		BILL RETURNS (3-MONTH)	
-----		-----		-----	
MINIMUM	3.22	MINIMUM	1.80	MINIMUM	1.55
LOWER QUARTILE	4.70	LOWER QUARTILE	2.13	LOWER QUARTILE	1.90
MEDIAN	5.00	MEDIAN	2.70	MEDIAN	2.02
UPPER QUARTILE	6.70	UPPER QUARTILE	3.41	UPPER QUARTILE	2.61
MAXIMUM	15.00	MAXIMUM	4.00	MAXIMUM	3.20
MEAN	6.17	MEAN	2.81	MEAN	2.26
STD. DEVIATION	2.88	STD. DEVIATION	0.66	STD. DEVIATION	0.51
N	17	N	23	N	21
MISSING	20	MISSING	14	MISSING	16

Source: Research Department, Federal Reserve Bank of Philadelphia.  
 Survey of Professional Forecasters, First Quarter 2020.