SURVEY OF PROFESSIONAL FORECASTERS

FIRST QUARTER 2023

Forecasters See Higher Growth and Stronger Labor Market in 2023

The outlook for the U.S. economy in 2023 looks somewhat better now than it did three months ago, according to 37 forecasters surveyed by the Federal Reserve Bank of Philadelphia. The forecasters predict the economy will expand at an annual rate of 0.6 percent this quarter and 1.0 percent in the second quarter of 2023, up from the previous predictions of 0.2 percent in each quarter. On an annual-average over annual-average basis, the forecasters expect real GDP to increase 1.3 percent in 2023, up from the projection of 0.7 percent in the survey of three months ago.

A downward revision to the path for the unemployment rate accompanies the outlook for growth. The forecasters predict the unemployment rate will increase from 3.5 percent this quarter to 4.1 percent in the fourth quarter of 2023. In the previous survey, the unemployment rate was forecast to rise from 3.8 percent to 4.4 percent over the same period. On an annual-average basis, the forecasters expect the unemployment rate to average 3.8 percent this year, marking a downward revision from the previous estimate of 4.2 percent.
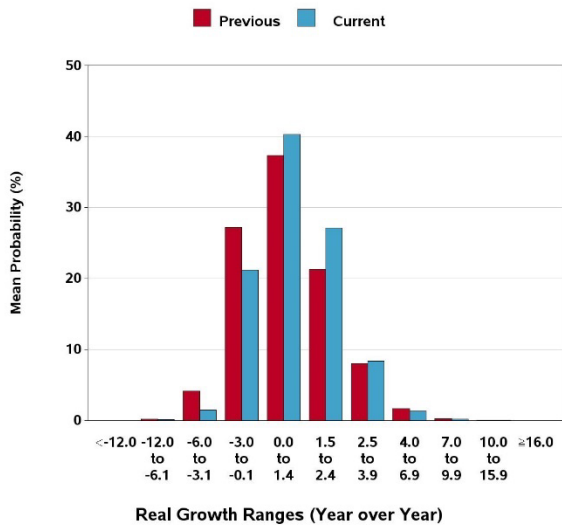
On the employment front, the panelists have revised upward their estimates for job gains in 2023. The projections for the annual-average level of nonfarm payroll employment suggest job gains at a monthly rate of 217,800 in 2023, up from 143,600 projected three months ago.

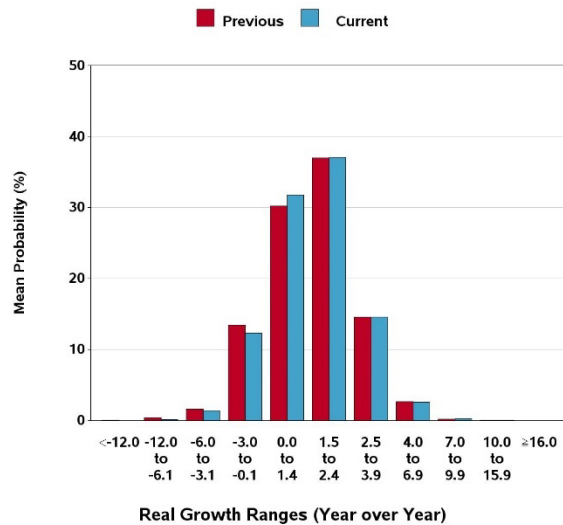*Median Forecasts for Selected Variables in the Current and Previous Surveys*

	Real GDP (%)		Unemployment Rate (%)		Payrolls (000s/month)	
	Previous	New	Previous	New	Previous	New
Quarterly data:						
2023:Q1	0.2	0.6	3.8	3.5	79.0	281.9
2023:Q2	0.2	1.0	4.0	3.7	35.8	0.5
2023:Q3	0.9	-0.1	4.3	3.9	41.8	47.5
2023:Q4	2.1	1.2	4.4	4.1	-14.5	62.7
2024:Q1	N.A.	1.3	N.A.	4.2	N.A.	60.8
Annual data (projections are based on annual-average levels):						
2023	0.7	1.3	4.2	3.8	143.6	217.8
2024	1.8	1.4	4.3	4.2	N.A.	43.3
2025	2.2	2.2	4.2	4.2	N.A.	N.A.
2026	N.A.	1.5	N.A.	4.1	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. For 2023, the forecasters see a higher probability that growth will fall into the positive ranges than they did in the previous survey. For 2024 and 2025, the forecasters see few changes to the probability estimates they projected in the survey of three months ago.

Mean Probabilities for Real GDP Growth in 2023
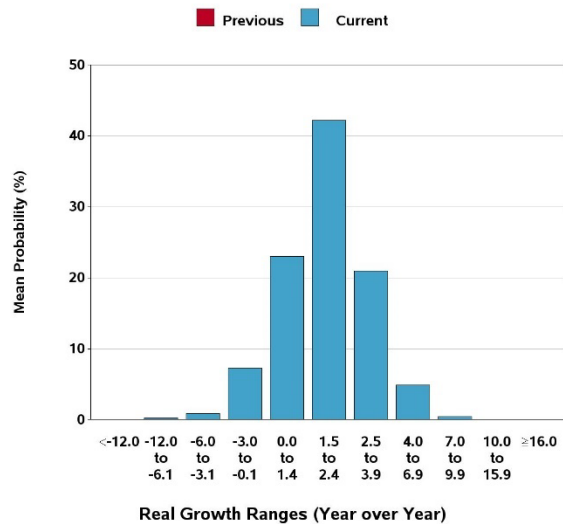
Previous / Current

Mean Probabilities for Real GDP Growth in 2024

Previous / Current

Mean Probabilities for Real GDP Growth in 2025

Previous / Current

Mean Probabilities for Real GDP Growth in 2026

Previous / Current

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 and previous estimates of the probability that unemployment will fall into each of 10 ranges. For 2023 and 2024, the forecasters are raising their probability estimates from the previous survey for an unemployment rate below 4.0 percent.

Mean Probabilities for Unemployment Rate in 2023
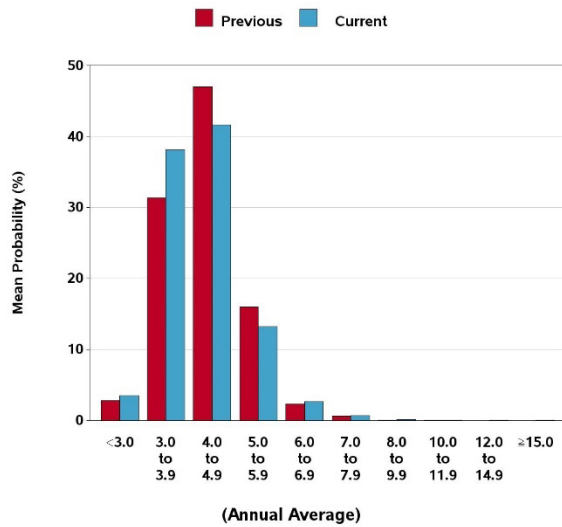
Mean Probabilities for Unemployment Rate in 2024
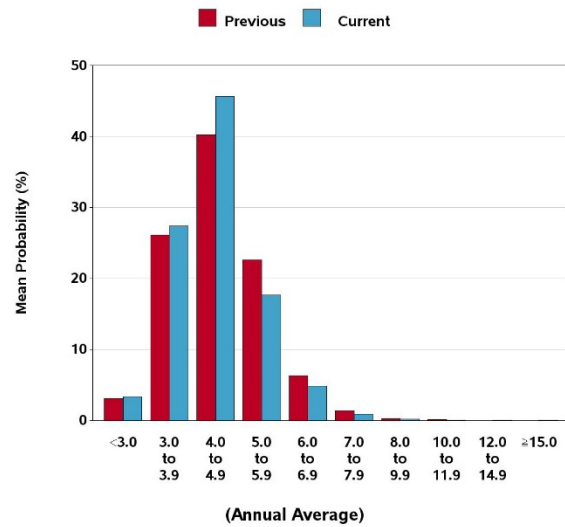
Mean Probabilities for Unemployment Rate in 2025
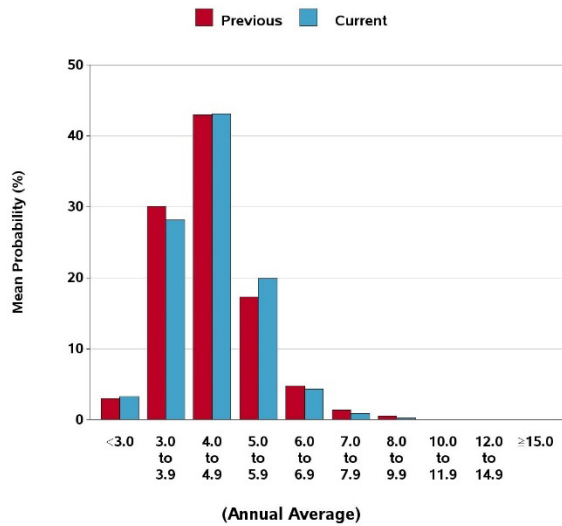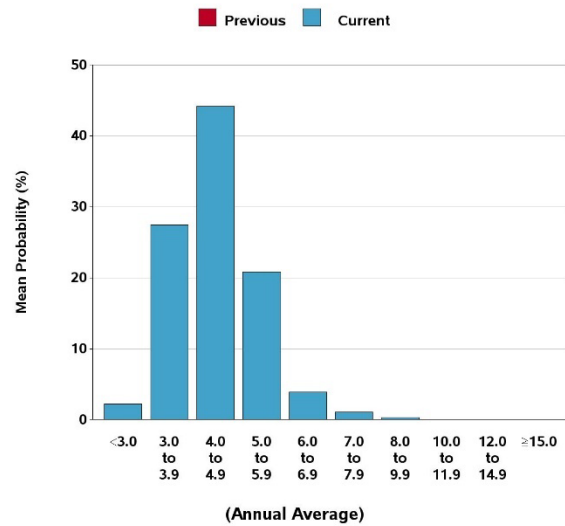

Mean Probabilities for Unemployment Rate in 2026

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Forecasters Predict Lower Inflation

The forecasters expect current-quarter headline CPI inflation will average 3.3 percent at an annual rate, down from the prediction of 4.5 percent in the survey of three months ago. Headline PCE inflation over the current quarter will also be lower at an annual rate of 3.2 percent, down from the previous estimate of 3.8 percent.

Projections for headline and core CPI and PCE inflation at all other forecast horizons have also been revised downward or remain unchanged, compared with those of the previous survey.

Over the next 10 years, 2023 to 2032, the forecasters predict headline CPI inflation will be at an annual-average rate of 2.37 percent. The corresponding estimate for 10-year annual-average PCE inflation is 2.15 percent. Notably, these 10-year projections are 0.58 percentage point and 0.43 percentage point lower than those of the previous survey, which covered the 10-year horizon from 2022 to 2031.

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
Quarterly								
2023:Q1	4.5	3.3	4.5	3.8	3.8	3.2	3.8	3.6
2023:Q2	3.5	3.4	3.7	3.6	3.1	3.0	3.2	3.1
2023:Q3	3.1	3.1	3.2	3.1	2.7	2.6	2.8	2.7
2023:Q4	2.9	2.8	2.9	2.9	2.7	2.6	2.7	2.5
2024:Q1	N.A.	2.6	N.A.	2.8	N.A.	2.3	N.A.	2.5
Q4/Q4 Annual Averages								
2023	3.4	3.1	3.5	3.4	2.9	2.8	3.0	3.0
2024	2.5	2.5	2.6	2.6	2.3	2.2	2.4	2.3
2025	N.A.	2.4	N.A.	2.4	N.A.	2.2	N.A.	2.1
Long-Term Annual Averages								
2022-2026	3.75	N.A.	N.A.	N.A.	3.23	N.A.	N.A.	N.A.
2023-2027	N.A.	2.50	N.A.	N.A.	N.A.	2.30	N.A.	N.A.
2022-2031	2.95	N.A.	N.A.	N.A.	2.58	N.A.	N.A.	N.A.
2023-2032	N.A.	2.37	N.A.	N.A.	N.A.	2.15	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 10-year annual-average CPI and PCE inflation. The charts provide perspective on the lower 10-year inflation expectations in the current survey.

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

Percent

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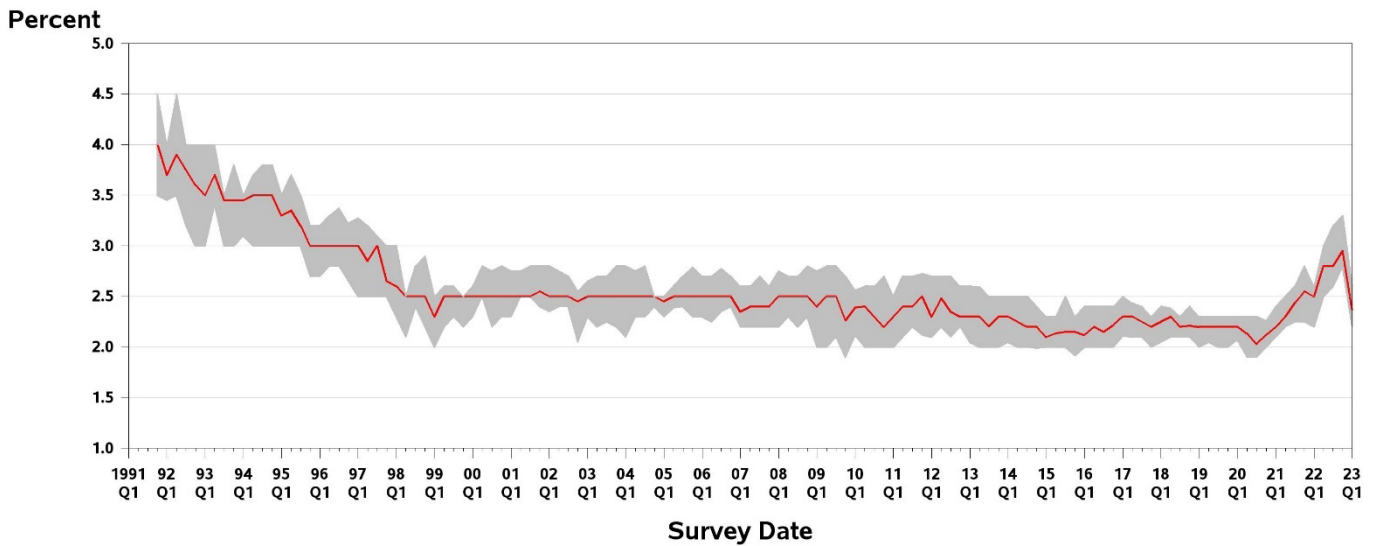
Projections for the 10-Year Annual-Average Rate of PCE Inflation
(Median and Interquartile Range)

Percent

Survey Date

5
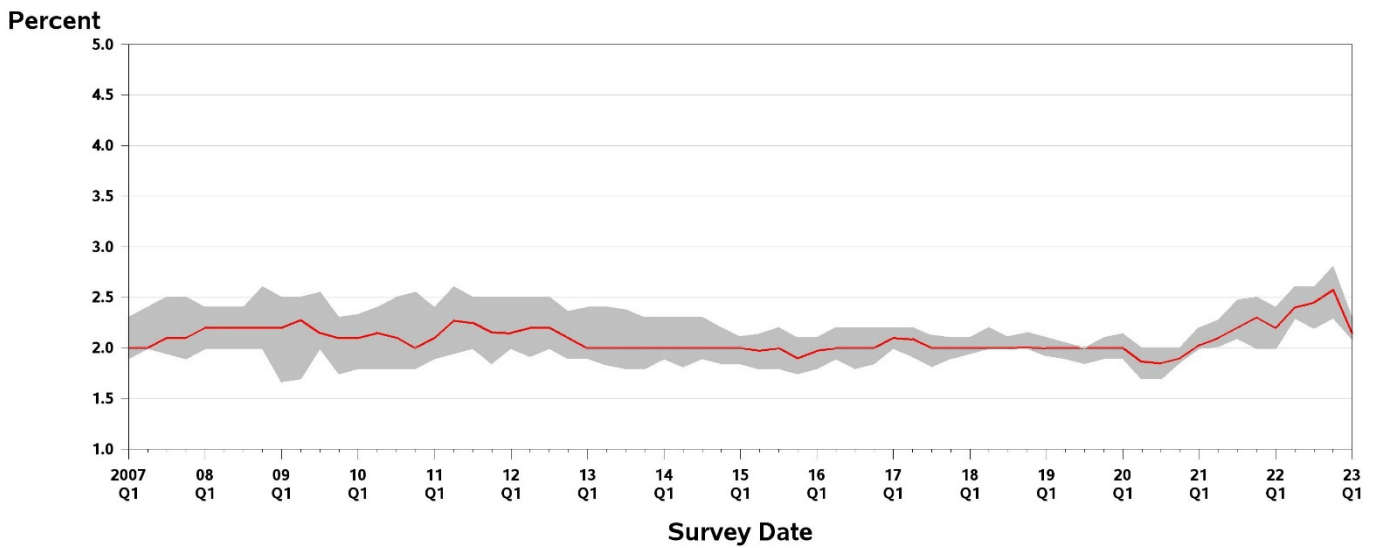
The figures below show the probabilities that the forecasters are assigning to each of 10 possible ranges for fourth-quarter over fourth-quarter core PCE inflation in 2023 and 2024. The forecasters have reduced their estimates for the probability that core PCE inflation in 2023 will be 3.5 percent or higher compared with their prediction in the last survey.

Mean Probabilities for Core PCE Inflation in 2023
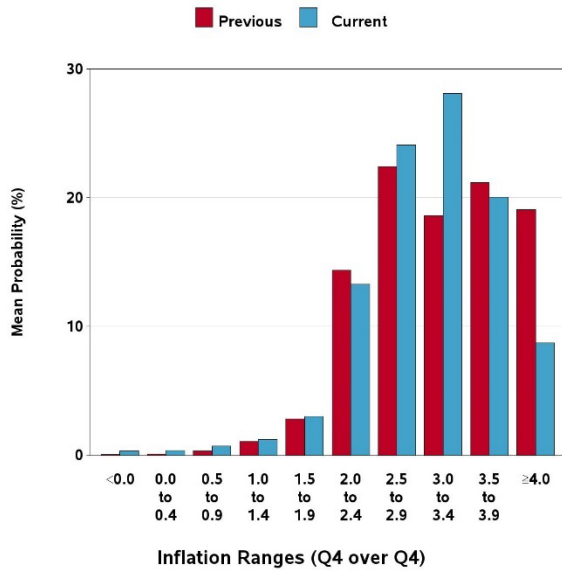
Mean Probabilities for Core PCE Inflation in 2024
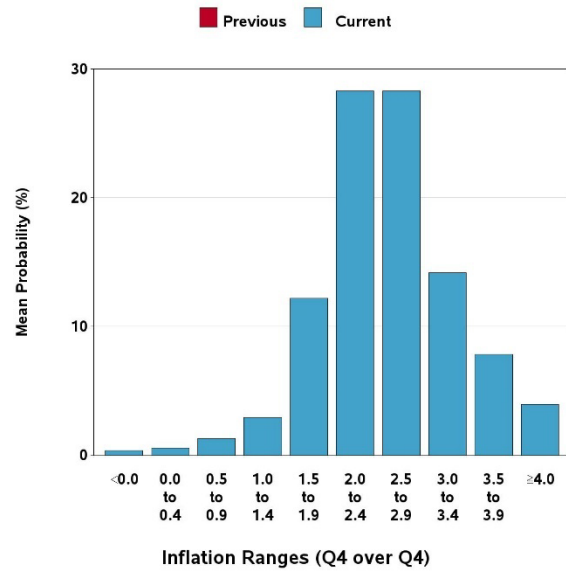
Lower (but Significant) Risk of Negative Real GDP Growth in 2023
The forecasters have revised downward the chance of a contraction in real GDP in any of the next four quarters. For the current quarter, the forecasters predict a 40.4 percent chance of negative growth, down from 47.2 percent in the previous survey. The forecasters have also made downward revisions to their probability estimates for the following three quarters.

Risk of a Negative Quarter (%)
Survey Means

Quarterly data:	Previous	New
2023:Q1	47.2	40.4
2023:Q2	49.4	42.4
2023:Q3	46.1	44.9
2023:Q4	43.5	40.6
2024:Q1	N.A.	31.8

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 2023 and 2024.

Fourteen 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 -4.4 percent to 0.0 percent in 2023 and from -3.0 percent to 4.0 percent in 2024.

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

	2023 (Q4/Q4 Percent Change)			2024 (Q4/Q4 Percent Change)		
Index	N	Mean	Median	N	Mean	Median
S&P CoreLogic Case-Shiller: U.S. National	5	-4.0	-4.2	5	-1.1	0.6
S&P CoreLogic Case-Shiller: Composite 10	1	0.0	0.0	1	4.0	4.0
S&P CoreLogic Case-Shiller: Composite 20	4	-3.6	-4.4	4	1.0	1.7
FHFA: Purchase Only (U.S. Total)	8	0.3	-1.5	8	2.0	2.2
CoreLogic: National HPI, incl. Distressed Sales (Single Family Combined)	2	-3.6	-3.6	1	-3.0	-3.0
NAR Median: Total Existing	2	-2.3	-2.3	2	1.4	1.4

Lower Long-Term Output and Productivity Growth but Higher Returns on 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 forecasters expect real GDP to grow at an annual-average rate of 2.00 percent over the next 10 years, lower than their projection of 2.28 percent in the first-quarter survey of 2022. Ten-year annual-average productivity growth is now expected to be 1.30 percent, down from 1.60 percent previously.

Higher returns on financial assets over the next 10 years accompany the current long-term outlook for real GDP and productivity. The forecasters predict the S&P 500 returning an annual-average 7.50 percent over the next 10 years, up from the previous estimate of 6.73 percent in the first-quarter survey of 2022. The forecasters see the rate on 10-year Treasuries averaging 3.35 percent over the next 10 years, up from 3.07 percent in last year's first-quarter survey. Three-month Treasury bills will return an annual-average 2.65 percent over the next 10 years, up from 2.25 percent previously.

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

	First Quarter 2022	*Current Survey*
Real GDP Growth	2.28	2.00
Productivity Growth	1.60	1.30
Stock Returns (S&P 500)	6.73	7.50
Rate on 10-Year Treasury Bonds	3.07	3.35
Bill Returns (3-Month)	2.25	2.65

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                        SUMMARY TABLE
              SURVEY OF PROFESSIONAL FORECASTERS
               MAJOR MACROECONOMIC INDICATORS
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	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	2023	2024 (YEAR-OVER-YEAR)	2025	2026
PERCENT GROWTH AT ANNUAL RATES									
1. REAL GDP (BILLIONS, CHAIN WEIGHTED)	0.6	1.0	-0.1	1.2	1.3	1.3	1.4	2.2	1.5
2. GDP PRICE INDEX (PERCENT CHANGE)	3.2	2.9	2.8	2.6	2.4	3.6	2.3	N.A.	N.A.
3. NOMINAL GDP ($ BILLIONS)	4.0	3.4	3.5	3.9	4.2	5.0	3.8	N.A.	N.A.
4. NONFARM PAYROLL EMPLOYMENT (PERCENT CHANGE)	2.2	0.0	0.4	0.5	0.5	1.7	0.3	N.A.	N.A.
(AVG MONTHLY CHANGE)	281.9	0.5	47.5	62.7	60.8	217.8	43.3	N.A.	N.A.
VARIABLES IN LEVELS									
5. UNEMPLOYMENT RATE (PERCENT)	3.5	3.7	3.9	4.1	4.2	3.8	4.2	4.2	4.1
6. 3-MONTH TREASURY BILL (PERCENT)	4.7	5.0	4.9	4.9	4.5	4.9	4.1	3.1	2.8
7. 10-YEAR TREASURY BOND (PERCENT)	3.6	3.8	3.9	3.7	3.6	3.8	3.5	3.5	3.3

	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	2023	2024 (Q4-OVER-Q4)	2025
INFLATION INDICATORS								
8. CPI (ANNUAL RATE)	3.3	3.4	3.1	2.8	2.6	3.1	2.5	2.4
9. CORE CPI (ANNUAL RATE)	3.8	3.6	3.1	2.9	2.8	3.4	2.6	2.4
10. PCE (ANNUAL RATE)	3.2	3.0	2.6	2.6	2.3	2.8	2.2	2.2
11. CORE PCE (ANNUAL RATE)	3.6	3.1	2.7	2.5	2.5	3.0	2.3	2.1

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 2023.

SURVEY OF PROFESSIONAL FORECASTERS

First Quarter 2023

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 26, 2023; the tables do not reflect subsequent revisions to the data. All forecasts were received on or before February 7, 2023.

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                                  TABLE ONE
                       MAJOR MACROECONOMIC INDICATORS
                       MEDIANS OF FORECASTER PREDICTIONS


                    NUMBER  ACTUAL           FORECAST              ACTUAL        FORECAST
                      OF    ─────  ─────────────────────────────  ─────  ──────────────────────
                            2022   2023   2023  2023  2023  2024   2022   2023   2024   2025   2026
                  FORECASTERS Q4    Q1    Q2    Q3    Q4    Q1    ANNUAL ANNUAL ANNUAL ANNUAL ANNUAL
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	NUMBER OF FORECASTERS	ACTUAL 2022 Q4	FORECAST 2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	ACTUAL 2022 ANNUAL	FORECAST 2023 ANNUAL	2024 ANNUAL	2025 ANNUAL	2026 ANNUAL
1. GROSS DOMESTIC PRODUCT (GDP) ($ BILLIONS)	33	26133	26391	26612	26839	27094	27375	25461	26723	27752	N.A.	N.A.
2. GDP PRICE INDEX (2012=100)	33	129.37	130.40	131.34	132.25	133.10	133.90	127.19	131.81	134.79	N.A.	N.A.
3. CORPORATE PROFITS AFTER TAXES ($ BILLIONS)	15	N.A.	2550.7	2519.9	2516.9	2520.9	2550.4	N.A.	2520.2	2612.6	N.A.	N.A.
4. UNEMPLOYMENT RATE (PERCENT)	36	3.6	3.5	3.7	3.9	4.1	4.2	3.6	3.8	4.2	4.2	4.1
5. NONFARM PAYROLL EMPLOYMENT (THOUSANDS)	30	153509	154355	154356	154499	154687	154869	152041	154655	155174	N.A.	N.A.
6. INDUSTRIAL PRODUCTION (2017=100)	27	104.1	104.0	103.7	103.8	104.1	104.1	103.9	103.9	104.2	N.A.	N.A.
7. NEW PRIVATE HOUSING STARTS (ANNUAL RATE, MILLIONS)	30	1.40	1.38	1.35	1.33	1.35	1.37	1.56	1.35	1.40	N.A.	N.A.
8. 3-MONTH TREASURY BILL RATE (PERCENT)	36	4.04	4.70	4.95	4.92	4.89	4.52	2.02	4.87	4.07	3.10	2.80
9. MOODY'S AAA CORP BOND YIELD * (PERCENT)	23	N.A.	4.55	4.90	4.89	5.05	4.94	N.A.	4.74	4.84	N.A.	N.A.
10. MOODY'S BAA CORP BOND YIELD * (PERCENT)	21	N.A.	5.69	6.06	6.25	6.25	6.12	N.A.	6.09	5.95	N.A.	N.A.
11. 10-YEAR TREASURY BOND YIELD (PERCENT)	34	3.83	3.64	3.78	3.86	3.69	3.55	2.95	3.76	3.52	3.45	3.32
12. REAL GDP (BILLIONS, CHAIN WEIGHTED)	37	20198	20227	20279	20273	20331	20395	20018	20277	20561	21004	21316
13. TOTAL CONSUMPTION EXPENDITURE (BILLIONS, CHAIN WEIGHTED)	31	14252.2	14295.4	14331.9	14390.9	14437.5	14473.4	14139.7	14371.3	14548.2	N.A.	N.A.
14. NONRESIDENTIAL FIXED INVESTMENT (BILLIONS, CHAIN WEIGHTED)	29	2964.7	2975.0	2985.8	2995.0	3004.6	3021.6	2938.7	2992.2	3047.6	N.A.	N.A.
15. RESIDENTIAL FIXED INVESTMENT (BILLIONS, CHAIN WEIGHTED)	30	573.6	558.7	551.2	544.5	544.5	551.3	642.3	549.5	563.6	N.A.	N.A.
16. FEDERAL GOVERNMENT C & I (BILLIONS, CHAIN WEIGHTED)	29	1374.1	1382.6	1391.2	1396.3	1396.8	1398.2	1355.5	1391.3	1404.3	N.A.	N.A.
17. STATE AND LOCAL GOVT C & I (BILLIONS, CHAIN WEIGHTED)	30	2068.3	2076.0	2084.5	2092.0	2098.8	2104.2	2050.8	2088.1	2110.6	N.A.	N.A.
18. CHANGE IN PRIVATE INVENTORIES (BILLIONS, CHAIN WEIGHTED)	30	129.9	76.0	49.1	37.7	42.1	43.1	123.3	46.6	42.9	N.A.	N.A.
19. NET EXPORTS (BILLIONS, CHAIN WEIGHTED)	30	-1232.4	-1233.4	-1234.7	-1229.6	-1224.5	-1224.8	-1355.1	-1228.2	-1216.0	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 2023.

	NUMBER OF FORECASTERS	Q4 2022 TO Q1 2023	Q1 2023 TO Q2 2023	Q2 2023 TO Q3 2023	Q3 2023 TO Q4 2023	Q4 2023 TO Q1 2024	2022 TO 2023	2023 TO 2024	2024 TO 2025	2025 TO 2026
1. GROSS DOMESTIC PRODUCT (GDP) ($ BILLIONS)	33	4.0	3.4	3.5	3.9	4.2	5.0	3.8	N.A.	N.A.
2. GDP PRICE INDEX (2012=100)	33	3.2	2.9	2.8	2.6	2.4	3.6	2.3	N.A.	N.A.
3. CORPORATE PROFITS AFTER TAXES ($ BILLIONS)	15	-0.4	-4.7	-0.5	0.6	4.8	0.9	3.7	N.A.	N.A.
4. UNEMPLOYMENT RATE (PERCENT)	36	-0.1	0.2	0.2	0.1	0.2	0.2	0.4	0.0	-0.1
5. NONFARM PAYROLL EMPLOYMENT (PERCENT CHANGE)	30	2.2	0.0	0.4	0.5	0.5	1.7	0.3	N.A.	N.A.
(AVG MONTHLY CHANGE)	30	281.9	0.5	47.5	62.7	60.8	217.8	43.3	N.A.	N.A.
6. INDUSTRIAL PRODUCTION (2017=100)	27	-0.2	-1.3	0.5	0.8	0.2	-0.0	0.3	N.A.	N.A.
7. NEW PRIVATE HOUSING STARTS (ANNUAL RATE, MILLIONS)	30	-7.3	-7.5	-4.9	4.1	6.5	-13.2	3.7	N.A.	N.A.
8. 3-MONTH TREASURY BILL RATE (PERCENT)	36	0.66	0.25	-0.03	-0.04	-0.37	2.85	-0.80	-0.97	-0.30
9. MOODY'S AAA CORP BOND YIELD * (PERCENT)	23	N.A.	0.35	-0.01	0.16	-0.11	N.A.	0.10	N.A.	N.A.
10. MOODY'S BAA CORP BOND YIELD * (PERCENT)	21	N.A.	0.37	0.19	0.00	-0.13	N.A.	-0.14	N.A.	N.A.
11. 10-YEAR TREASURY BOND YIELD (PERCENT)	34	-0.19	0.13	0.09	-0.18	-0.14	0.81	-0.24	-0.07	-0.13
12. REAL GDP (BILLIONS, CHAIN WEIGHTED)	37	0.6	1.0	-0.1	1.2	1.3	1.3	1.4	2.2	1.5
13. TOTAL CONSUMPTION EXPENDITURE (BILLIONS, CHAIN WEIGHTED)	31	1.2	1.0	1.7	1.3	1.0	1.6	1.2	N.A.	N.A.
14. NONRESIDENTIAL FIXED INVESTMENT (BILLIONS, CHAIN WEIGHTED)	29	1.4	1.5	1.2	1.3	2.3	1.8	1.8	N.A.	N.A.
15. RESIDENTIAL FIXED INVESTMENT (BILLIONS, CHAIN WEIGHTED)	30	-10.0	-5.3	-4.7	0.0	5.1	-14.4	2.6	N.A.	N.A.
16. FEDERAL GOVERNMENT C & I (BILLIONS, CHAIN WEIGHTED)	29	2.5	2.5	1.5	0.1	0.4	2.6	0.9	N.A.	N.A.
17. STATE AND LOCAL GOVT C & I (BILLIONS, CHAIN WEIGHTED)	30	1.5	1.6	1.4	1.3	1.0	1.8	1.1	N.A.	N.A.
18. CHANGE IN PRIVATE INVENTORIES (BILLIONS, CHAIN WEIGHTED)	30	-54.0	-26.8	-11.4	4.4	1.0	-76.7	-3.8	N.A.	N.A.
19. NET EXPORTS (BILLIONS, CHAIN WEIGHTED)	30	-1.0	-1.3	5.1	5.1	-0.3	126.9	12.2	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 2023.

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                                TABLE THREE
                          MAJOR PRICE INDICATORS
                       MEDIANS OF FORECASTER PREDICTIONS
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	NUMBER OF FORECASTERS	ACTUAL 2022 Q4	FORECAST(Q/Q) 2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	ACTUAL 2022 ANNUAL	FORECAST(Q4/Q4) 2023 ANNUAL	2024 ANNUAL	2025 ANNUAL
1. CONSUMER PRICE INDEX (ANNUAL RATE)	36	3.1	3.3	3.4	3.1	2.8	2.6	7.1	3.1	2.5	2.4
2. CORE CONSUMER PRICE INDEX (ANNUAL RATE)	34	4.4	3.8	3.6	3.1	2.9	2.8	6.0	3.4	2.6	2.4
3. PCE PRICE INDEX (ANNUAL RATE)	35	3.2	3.2	3.0	2.6	2.6	2.3	5.5	2.8	2.2	2.2
4. CORE PCE PRICE INDEX (ANNUAL RATE)	34	3.9	3.6	3.1	2.7	2.5	2.5	4.7	3.0	2.3	2.1

Source: Research Department, Federal Reserve Bank of Philadelphia. Survey of Professional Forecasters, First Quarter 2023.

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                                    TABLE FOUR
                                   YIELD SPREADS
                          MEDIANS OF FORECASTER PREDICTIONS
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	NUMBER OF FORECASTERS	ACTUAL 2022 Q4	FORECAST					ACTUAL 2022 ANNUAL	FORECAST			
			2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1		2023 ANNUAL	2024 ANNUAL	2025 ANNUAL	2026 ANNUAL
1. TBOND MINUS TBILL (PERCENTAGE POINTS)	34	-0.21	-1.09	-0.98	-0.87	-0.82	-0.65	0.93	-0.95	-0.43	0.25	0.50
2. AAA MINUS TBOND (PERCENTAGE POINTS)	23	N.A.	0.92	1.00	1.04	1.09	1.09	N.A.	1.00	1.02	N.A.	N.A.
3. BAA MINUS TBOND (PERCENTAGE POINTS)	21	N.A.	2.00	2.20	2.28	2.28	2.25	N.A.	2.20	2.21	N.A.	N.A.
4. BAA MINUS AAA (PERCENTAGE POINTS)	21	N.A.	1.07	1.10	1.10	1.10	1.00	N.A.	1.09	1.07	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 2023.

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                         TABLE FIVE
          ESTIMATED PROBABILITY OF DECLINE IN REAL GDP


ESTIMATED              Q4 2022   Q1 2023   Q2 2023   Q3 2023   Q4 2023
PROBABILITY              TO        TO        TO        TO        TO
(CHANCES IN 100)       Q1 2023   Q2 2023   Q3 2023   Q4 2023   Q1 2024


                           NUMBER OF FORECASTERS

10 OR LESS                3         1         0         2         3
11 TO 20                  5         4         5         3         7
21 TO 30                  2         7         3         6         8
31 TO 40                  7         6         9         5         3
41 TO 50                  4         2         1         4         2
51 TO 60                  2         2         3         2         4
61 TO 70                  1         2         3         5         0
71 TO 80                  3         2         3         1         1
81 TO 90                  0         2         1         0         0
91 AND OVER               1         0         0         0         0
NOT REPORTING             9         9         9         9         9


MEAN AND MEDIAN

MEDIAN PROBABILITY      40.00     36.25     39.00     35.00     30.00
MEAN PROBABILITY        40.39     42.41     44.85     40.61     31.78
```

Note: Total number of forecasters reporting is 28.

Source: Research Department, Federal Reserve Bank of Philadelphia.
        Survey of Professional Forecasters, First Quarter 2023.

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                            TABLE SIX
                         MEAN PROBABILITIES


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


                         2023        2024        2025        2026
                      _____   _____   _____   _____

   15.0 PERCENT OR MORE   0.03        0.04        0.00        0.00
   12.0 TO 14.9 PERCENT   0.03        0.04        0.00        0.00
   10.0 TO 11.9 PERCENT   0.03        0.04        0.00        0.00
    8.0 TO  9.9 PERCENT   0.14        0.21        0.23        0.34
    7.0 TO  7.9 PERCENT   0.69        0.89        0.88        1.10
    6.0 TO  6.9 PERCENT   2.64        4.86        4.37        3.92
    5.0 TO  5.9 PERCENT  13.19       17.63       19.91       20.83
    4.0 TO  4.9 PERCENT  41.66       45.63       43.13       44.16
    3.0 TO  3.9 PERCENT  38.09       27.36       28.17       27.45
  LESS THAN 3.0 PERCENT   3.48        3.32        3.31        2.22


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


                      2022-2023   2023-2024   2024-2025   2025-2026
                      _____   _____   _____   _____

   16.0 PERCENT OR MORE   0.00        0.00        0.00        0.00
   10.0 TO 15.9 PERCENT   0.03        0.04        0.00        0.00
    7.0 TO  9.9 PERCENT   0.17        0.23        0.38        0.43
    4.0 TO  6.9 PERCENT   1.33        2.55        5.01        4.93
    2.5 TO  3.9 PERCENT   8.32       14.55       20.29       20.97
    1.5 TO  2.4 PERCENT  27.14       37.06       40.48       42.20
    0.0 TO  1.4 PERCENT  40.28       31.79       23.85       23.05
   -3.0 TO -0.1 PERCENT  21.20       12.28        8.77        7.33
   -6.0 TO -3.1 PERCENT   1.42        1.39        1.00        0.85
  -12.0 TO -6.1 PERCENT   0.10        0.11        0.23        0.25
  LESS THAN -12.0 PERCENT 0.00        0.00        0.00        0.00


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


                      2022-2023   2023-2024
                      _____   _____

    4.0 PERCENT OR MORE  19.94        4.09
    3.5 TO 3.9 PERCENT   26.79        8.77
    3.0 TO 3.4 PERCENT   22.96       16.64
    2.5 TO 2.9 PERCENT   12.36       22.17
    2.0 TO 2.4 PERCENT    7.33       26.54
    1.5 TO 1.9 PERCENT    6.55       13.42
    1.0 TO 1.4 PERCENT    2.45        5.92
    0.5 TO 0.9 PERCENT    0.97        1.42
    0.0 TO 0.4 PERCENT    0.43        0.66
  LESS THAN 0.0 PERCENT   0.21        0.36
```

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



        MEAN PROBABILITY ATTACHED TO CORE CPI INFLATION:

                            22Q4 TO 23Q4   23Q4 TO 24Q4
                            _____   _____


        4.0 PERCENT OR MORE     18.22           6.07
        3.5 TO 3.9 PERCENT      26.19          10.77
        3.0 TO 3.4 PERCENT      22.64          16.82
        2.5 TO 2.9 PERCENT      18.23          25.84
        2.0 TO 2.4 PERCENT       7.27          25.54
        1.5 TO 1.9 PERCENT       1.66           7.70
        1.0 TO 1.4 PERCENT       0.90           1.94
        0.5 TO 0.9 PERCENT       0.86           0.83
        0.0 TO 0.4 PERCENT       0.74           1.16
     LESS THAN 0.0 PERCENT       3.30           3.34



        MEAN PROBABILITY ATTACHED TO CORE PCE INFLATION:

                            22Q4 TO 23Q4   23Q4 TO 24Q4
                            _____   _____


        4.0 PERCENT OR MORE      8.73           3.96
        3.5 TO 3.9 PERCENT      20.08           7.85
        3.0 TO 3.4 PERCENT      28.11          14.18
        2.5 TO 2.9 PERCENT      24.12          28.30
        2.0 TO 2.4 PERCENT      13.30          28.31
        1.5 TO 1.9 PERCENT       3.02          12.20
        1.0 TO 1.4 PERCENT       1.21           2.94
        0.5 TO 0.9 PERCENT       0.70           1.31
        0.0 TO 0.4 PERCENT       0.38           0.57
     LESS THAN 0.0 PERCENT       0.35           0.38
```

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


        ANNUAL AVERAGE OVER THE NEXT 5 YEARS: 2023-2027
        ================================================

        CPI INFLATION RATE              PCE INFLATION RATE
        ------------------------        ------------------------
        MINIMUM           2.14          MINIMUM           1.59
        LOWER QUARTILE    2.40          LOWER QUARTILE    2.20
        MEDIAN            2.50          MEDIAN            2.30
        UPPER QUARTILE    2.80          UPPER QUARTILE    2.50
        MAXIMUM           3.75          MAXIMUM           3.25
        MEAN              2.65          MEAN              2.37
        STD. DEVIATION    0.43          STD. DEVIATION    0.36
        N                   29          N                   28
        MISSING              8          MISSING              9


        ANNUAL AVERAGE OVER THE FOLLOWING 5 YEARS: 2028-2032
        ====================================================

        CPI INFLATION RATE              PCE INFLATION RATE
        ------------------------        ------------------------
        MINIMUM           1.70          MINIMUM           1.26
        LOWER QUARTILE    2.00          LOWER QUARTILE    1.90
        MEDIAN            2.20          MEDIAN            2.00
        UPPER QUARTILE    2.33          UPPER QUARTILE    2.25
        MAXIMUM           3.70          MAXIMUM           3.29
        MEAN              2.21          MEAN              2.07
        STD. DEVIATION    0.38          STD. DEVIATION    0.39
        N                   28          N                   27
        MISSING              9          MISSING             10


        ANNUAL AVERAGE OVER THE NEXT 10 YEARS: 2023-2032
        ================================================

        CPI INFLATION RATE              PCE INFLATION RATE
        ------------------------        ------------------------
        MINIMUM           1.96          MINIMUM           1.79
        LOWER QUARTILE    2.20          LOWER QUARTILE    2.09
        MEDIAN            2.37          MEDIAN            2.15
        UPPER QUARTILE    2.60          UPPER QUARTILE    2.30
        MAXIMUM           3.70          MAXIMUM           3.00
        MEAN              2.44          MEAN              2.23
        STD. DEVIATION    0.35          STD. DEVIATION    0.30
        N                   28          N                   27
        MISSING              9          MISSING             10
```

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 2023.

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


ANNUAL AVERAGE OVER THE NEXT 10 YEARS: 2023-2032
================================================


REAL GDP GROWTH RATE                PRODUCTIVITY GROWTH RATE
------------------------            ------------------------
MINIMUM             1.50            MINIMUM             0.50
LOWER QUARTILE      1.75            LOWER QUARTILE      1.00
MEDIAN              2.00            MEDIAN              1.30
UPPER QUARTILE      2.16            UPPER QUARTILE      1.40
MAXIMUM             2.80            MAXIMUM             3.00
MEAN                1.96            MEAN                1.33
STD. DEVIATION      0.33            STD. DEVIATION      0.58
N                     25            N                     17
MISSING               12            MISSING               20


STOCK RETURNS (S&P 500)             BOND RATE (10-YEAR)                 BILL RETURNS (3-MONTH)
------------------------            ------------------------            ------------------------
MINIMUM             1.80            MINIMUM             2.40            MINIMUM             1.10
LOWER QUARTILE      5.00            LOWER QUARTILE      2.80            LOWER QUARTILE      2.40
MEDIAN              7.50            MEDIAN              3.35            MEDIAN              2.65
UPPER QUARTILE      8.00            UPPER QUARTILE      3.51            UPPER QUARTILE      3.23
MAXIMUM            10.50            MAXIMUM             4.25            MAXIMUM             4.00
MEAN                6.82            MEAN                3.28            MEAN                2.75
STD. DEVIATION      2.31            STD. DEVIATION      0.51            STD. DEVIATION      0.66
N                     13            N                     22            N                     22
MISSING               24            MISSING               15            MISSING               15
```