

Survey of Professional Forecasters: Instructions for Panelists

Data Sources and Descriptions

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This document provides instructions for the survey's panelists on the variables currently included in the Survey of Professional Forecasters, the current definitions of the variables, and any current transformations of variables. For many variables, panelists may submit their projections in levels or growth rates. A section below describes the formulas for growth rates.

Preliminary Information

Many of the variables can be found in the Bureau of Economic Analysis's *Survey of Current Business* (abbreviated SCB): <http://www.bea.gov>. Original sources are also listed if other than SCB. In addition, the most recent numbers can be found in monthly releases by the government agencies that produce the data. For users of data from Haver Analytics Inc., we list below the Haver mnemonic for each series.

A substantial number of the survey's variables are from the U.S. national income and product accounts. Beginning with the survey of 2018:Q3, forecasts for real variables from the national income and product accounts are scaled to a base year of 2012 (and expressed in 2012 chain-weighted dollars). The survey's projections for the level of the GDP price index are also scaled to a base year of 2012 beginning with the survey of 2018:Q3.

In the sections below on the definitions of variables, we list in parentheses after each variable name three terms describing the data. The first term tells something about the type of adjustments to the data: "SAAR" means that data are seasonally adjusted at annual rates, "SA" means seasonally adjusted, "AR" means at an annual rate, and "NSA" means not seasonally adjusted

data. The second term tells the units of the data. For example, a “\$” indicates nominal data, and “\$ 12C” indicates real chain-weighted data with a base year of 2012. The third term tells the periodicity of the data, usually “monthly” or “quarterly.”

A Note on Data Transformations

Here are some notes on the transformations of the variables in the survey:

- **Daily Observations (Interest Rates).** For variables available at a daily observation frequency: The survey asks for quarterly forecasts of the quarterly average level of the daily observations. The survey also asks for annual forecasts for the annual-average of the daily observations.
- **Monthly Observations #1 (Unemployment Rate, Nonfarm Payroll Employment, Industrial Production Index, Housing Starts).** For most survey variables available at a monthly observation frequency: The survey asks for quarterly forecasts of the quarterly-average level of the monthly observations. The survey also asks for annual forecasts of the annual-average level of the monthly observations. For nonfarm payroll employment and industrial production, panelists may submit their projections for growth rates, rather than levels. Quarterly growth-rate projections are for the quarter-over-quarter percent change in the quarterly-average level, expressed in annualized percentage points. Annual growth-rate projections are for the year-over-year percent change in the annual-average level, expressed in percentage points.
- **Monthly Observations #2 (CPI Inflation and Inflation in PCE Price Index).** For CPI inflation and PCE inflation (headline measures and core measures), panelists submit their quarterly forecasts for the quarter-over-quarter percent change in the quarterly-average index level, expressed in annualized percentage points. Annual forecasts are for the

fourth-quarter over fourth-quarter percent change in the fourth-quarter, quarterly-average index level, expressed in percentage points.

- **Quarterly Observations (National Income and Product Accounts).** For variables from the national income and product accounts (NIPA), panelists submit quarterly forecasts for quarterly levels. Annual forecasts are for the annual-average level of the quarterly levels. Panelists may also submit forecasts for growth rates (all NIPA variables except the change in inventories and net exports). Quarterly growth-rate projections are for the quarter-over-quarter percent change in the quarterly level, expressed in annualized percentage points. Annual growth-rate projections are for the percent change in the annual-average level, expressed in percentage points.

Definitions of Variables: Section 1 - U.S. Business Indicators

1. ***Gross Domestic Product*** (SAAR, \$ Billions, Quarterly) - Source: Bureau of Economic Analysis, *Survey of Current Business*, Table 1.1.5 (https://www.bea.gov/iTable/index_nipa.cfm). **Notes:** (1) This is nominal GDP, not real GDP; (2) Annual forecasts for levels are for the annual-average level of the quarterly observations; (3) Panelists may submit their projection for levels or annualized growth rates. Growth-rate projections are for quarter-over-quarter growth and growth in the annual-average level. [Haver series: GDP@usecon]

2. ***GDP Chain-Weighted Price Index*** (SAAR, Index Level 2012=100, Quarterly) - Source: Bureau of Economic Analysis, *Survey of Current Business*, Table 1.1.4 (https://www.bea.gov/iTable/index_nipa.cfm). **Notes:** (1) This is the chain-weighted price index, not the implicit deflator; (2) Annual forecasts for levels are the annual-average level of the quarterly observations; (3) Panelists may submit their projection for levels or annualized growth rates. Growth-rate projections are for quarter-over-quarter growth and growth in the annual-average level. [Haver series: JGDP@usna]

3. ***Corporate Profits After Tax*** (SAAR, \$ Billions, Quarterly) - Source: Bureau of Economic Analysis, *Survey of Current Business*, Table 1.12 (https://www.bea.gov/iTable/index_nipa.cfm). **Notes:** (1) Beginning with the survey of 2006:Q1, this is corporate profits after tax *with* inventory valuation and capital consumption adjustments. (Previous surveys used the after tax measure without adjustments.); (2) Annual forecasts for levels are for the annual-average level of the quarterly observations; (3) Panelists may submit their projection for levels or annualized growth rates. Growth-rate projections are for quarter-over-quarter growth and growth in the annual-average level. [Haver series: YCATJ@usecon]

4. ***Civilian Unemployment Rate*** (SA, Percentage Points, Monthly) - Source: Bureau of Labor Statistics (<http://www.bls.gov/cps/cpsatabs.htm>). See Table A-1. **Notes:** (1) This is the civilian unemployment rate, not the rate including armed services; (2) Quarterly levels are the quarterly average of the monthly levels; (3) Annual levels are the annual average of the monthly levels. [Haver series: LR@usecon]

5. ***Nonfarm Payroll Employment*** (SA, Thousands, Monthly) - Total number of employees on nonfarm payrolls. Source: Bureau of Labor Statistics's Employment Situation Summary, Table B-1 (<http://www.bls.gov/ces/cesbtabs.htm>). **Notes:** (1) Quarterly levels are the quarterly average of the monthly levels of nonfarm payroll employment; (2)

Annual levels are the annual average of the monthly levels; (3) This variable was added to the survey in 2003:Q4; (4) Panelists may submit their projection for levels or annualized growth rates. Growth-rate projections are for quarter-over-quarter growth in the quarterly-average level and growth in the annual-average level. [Haver series: LANAGRA@usecon]

6. ***Industrial Production Index*** (SA, Index Level 2012=100, Monthly) - Source: Federal Reserve Board statistical release G.17 (www.federalreserve.gov/releases/G17/). **Notes:** (1) Quarterly levels are the quarterly average of the monthly levels of the industrial production index; (2) Annual levels are the annual average of the monthly levels; (3) Panelists may submit their projection for levels or annualized growth rates. Growth-rate projections are for quarter-over-quarter growth in the quarterly-average level and growth in the annual-average level. [Haver series: IP@usecon]
7. ***Housing Starts*** (SAAR, Millions, Monthly) - Source: U.S. Census Bureau Report on New Residential Construction (<https://www.census.gov/construction/nrc/index.html>). See Table 3a of the press release. **Notes:** (1) Quarterly levels are the quarterly average of the monthly levels of housing starts; (2) Annual levels are the annual average of the monthly levels of housing starts. [Haver series: HST@usecon]
8. ***Treasury Bill Rate, Three-month, Secondary Market Rate, Annualized on Discount Basis*** (NSA, Annualized Percentage Points, Daily) - Source: Federal Reserve Board statistical release H.15 (www.federalreserve.gov/releases/h15/). **Notes:** (1) Quarterly levels are the quarterly average of the daily levels of interest rates, as reported in the H.15 release; (2) Annual levels are the annual average of the daily levels, as reported in the H.15 release; (3) This variable was added to the survey in 1981:Q3. [Haver series: FTBS3@usecon]

9. ***AAA Corporate Bond Yield, Moody's*** (NSA, Annualized Percentage Points, Daily) - Source: Moody's Corporation. **Notes:** (1) Quarterly levels are the quarterly average of the daily levels of interest rates; (2) Annual levels are the annual average of the daily levels; (3) This variable was added to the survey in 1981:Q3. Prior to the survey of 1990:Q4, this variable was the rate on "high-grade corporate bonds", not the Moody's rate; (4) Beginning with the survey of 2017:Q1, the historical values of this variable are provided only to the survey's panelists (not to the general public) through a special agreement between the Philadelphia Fed and Moody's Analytics. [Haver series: FAAA@usecon, discontinued from October 2016]

10. ***BAA Corporate Bond Yield, Moody's*** (NSA, Annualized Percentage Points, Daily) - Source: Moody's Corporation. **Notes:** (1) Quarterly levels are the quarterly average of the daily levels of interest rates; (2) Annual levels are the annual average of the daily levels; (3) This variable was added to the survey in 2010:Q1; (4) Beginning with the survey of 2017:Q1, the historical values of this variable are provided only to the survey's panelists (not to the general public) through a special agreement between the Philadelphia Fed and Moody's Analytics. [Haver series: FBAA@usecon, discontinued from October 2016]

11. ***Treasury Bond Rate, 10-year, Constant-Maturity, Secondary Market Rate*** (NSA, Annualized Percentage Points, Daily) - Source: Federal Reserve Board statistical release H.15 (www.federalreserve.gov/releases/h15/). **Notes:** (1) Quarterly levels are the quarterly average of the daily levels of interest rates, as reported in the H.15 release; (2) Annual levels are the annual average of the daily levels, as reported in the H.15 release; (3) This variable was added to the survey in 1992:Q1. [Haver series: FCM10@usecon]

Definitions of Variables: Section 2 - Real GDP and Its Components

All variables in this section are real, in billions of chained (2012) dollars. All are (SAAR, \$ 12C billions, Quarterly) and come from the Bureau of Economic Analysis' *Survey of Current Business*, Table 1.1.6 (https://www.bea.gov/iTable/index_nipa.cfm)

Annual levels are the annual average of the quarterly levels. Panelists may submit their projection for levels or annualized growth rates. (However, the projections for net exports and the change in inventories must be in levels.) Growth-rate projections are for quarter-over-quarter growth in the quarterly level and growth in the annual-average level.

The variables in this section were added to the survey in 1981:Q3. (However, our data sets include observations for real gross national product beginning with the survey of 1968:Q4. We constructed these forecasts for surveys prior to 1981:Q3 by using the panelists' forecasts for nominal GNP and the price index for nominal GNP.)

12. Real Gross Domestic Product [Haver series: GDPH@usecon]
13. Real Personal Consumption Expenditures [Haver series: CH@usecon]
14. Real Nonresidential Fixed Investment [Haver series: FNH@usecon]
15. Real Residential Fixed Investment [Haver series: FRH@usecon]
16. Real Federal Government Consumption Expenditures & Gross Investment [Haver series: GFH@usecon]
17. Real State and Local Government Consumption Expenditures & Gross Investment [Haver series: GSH@usecon]
18. Real Change in Private Inventories [Haver series: VH@usecon]
19. Real Net Exports of Goods and Services [Haver series: XNETH@usecon]

Definitions of Variables: Section 3 – CPI Inflation and PCE Inflation

For the variables in this section, quarterly values are the quarter-over-quarter percent change in the quarterly-average index level, expressed in annualized percentage points. Annual values are the fourth-quarter over fourth-quarter percent change in the fourth-quarter, quarterly-average index level. We ask panelists to submit their projections in growth-rate form (not levels).

20. ***Consumer Price Index Inflation, CPI-U, All-Urban*** (SAAR, Annualized Percentage Points, Quarterly) - Source: Bureau of Labor Statistics (www.bls.gov/cpi/data.htm).
Notes: (1) This variable was added to the survey in 1981:Q3 [Haver series: PCU@usecon]
21. ***Core Consumer Price Index Inflation, CPI-U [Excludes food and energy prices]*** (SAAR, Annualized Percentage Points, Quarterly) - Source: Bureau of Labor Statistics (www.bls.gov/cpi/data.htm). **Notes:** (1) This variable was added to the survey in 2007:Q1. [Haver series: PCUSLFE@usecon]
22. ***PCE Chain-Weight Price Index Inflation*** (SAAR, Annualized Percentage Points, Quarterly) - Bureau of Economic Analysis, *Survey of Current Business* Table 2.3.4 (https://www.bea.gov/iTable/index_nipa.cfm). **Notes:** (1) This variable was added to the survey in 2007:Q1. [Haver series: JC@usna]
23. ***Core PCE Chain-Weight Price Index Inflation [Excludes food and energy prices]*** (SAAR, Annualized Percentage Points, Quarterly) - Bureau of Economic Analysis, *Survey of Current Business* Table 2.3.4 (https://www.bea.gov/iTable/index_nipa.cfm). **Notes:** (1) This variable was added to the survey in 2007:Q1. [Haver series: JCXFE@usna]

Formulas for Growth Rates

This section provides the formulas to use for reporting your projections in growth rates. All growth rates should be annualized. For quarterly, quarter-over-quarter growth rates, we use the formula for quarterly compounding (not continuous compounding). For variables available at a higher observation frequency than quarterly (say, a monthly observation frequency), compute the quarterly average of the level prior to computing a quarter-over-quarter growth rate. That is, quarterly growth rates are for the growth in the quarterly-average level. For annual growth rates, the formula depends on the variable:

- For all variables other than CPI headline and core inflation and PCE headline and core inflation: Annual growth rates are for the growth in the *annual-average level* of the variable from one year to the next.
- For headline and core CPI inflation and PCE inflation: Annual growth rates are for the rate of growth in the *fourth-quarter quarterly-average level* from one year to the next.

Quarter-over-Quarter Growth Rates. Let X_t denote the quarterly observation for the level of variable X in period t , where t indexes the quarterly observation date. The variable X_t might be the quarterly level of real GDP or the quarterly-average of the level of a variable available at a monthly observation frequency. The calculation for quarter-over-quarter growth in period t is

$$(gX)_t^{(Q/Q)} = 100 \left[\left(\frac{X_t}{X_{t-1}} \right)^4 - 1 \right].$$

Annual Growth Rates: Growth in the Annual-Average Level for All Variables except CPI Inflation and PCE Inflation. Let Y_t denote the *annual-average level* of a variable in the year indexed by t . That is, $Y_t = (1/4) * (Y_{1t} + Y_{2t} + Y_{3t} + Y_{4t})$, where Y_{qt} is the level of the variable in quarter q of year t , $q = 1, 2, 3, 4$. The formula for the growth in the annual-average level in year t is

$$(gY)_t^{(AA/AA)} = 100 \left[\left(\frac{Y_t}{Y_{t-1}} \right) - 1 \right].$$

This formula applies to the survey's point forecasts for annual growth rates (all variables except CPI inflation and PCE inflation). It also applies to the survey's density projections for annual-average real GDP growth and annual-average growth in the GDP price index.

Annual Growth Rates: Fourth-Quarter over Fourth-Quarter for CPI Inflation and PCE Inflation. Let Z_t denote the fourth-quarter quarterly-average price index level in the year indexed by t . That is, $Z_t = Z_{4t}$, where Z_{4t} is the quarterly-average level in the fourth quarter of year t . The quarterly-average level in the fourth quarter is the average of the monthly levels in the fourth quarter. That is, $Z_{4t} = (1/3) * (Z_{Oct,t} + Z_{Nov,t} + Z_{Dec,t})$, where $Z_{m,t}$ is the level of the price index in month m of year t , $m = Oct, Nov, Dec$. The formula for annual growth in the level of the fourth-quarter quarterly-average price index level for headline and core CPI and headline and core PCE in year t is

$$(gZ)_t^{(Q4/Q4)} = 100 \left[\left(\frac{Z_t}{Z_{t-1}} \right) - 1 \right].$$

This formula applies to the survey's point forecasts for annual headline and core CPI inflation and annual headline and core PCE inflation. It also applies to the survey's density projections for annual core CPI inflation and annual core PCE inflation.

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