# PCE Price Index Details

- Compiled by Bureau of Economic Analysis (BEA).
- Surveys prices paid directly by, or on behalf of, consumers for goods and services.
- The products are those included in the GDP measure of personal consumption.
- Price weights derived primarily from business surveys using current and previous expenditures:
  - Census Bureau's monthly and annual retail trade surveys, the Service Annual Survey, and the Quarterly Services Survey.
  - Weights change more frequently than the CPI.

# Formula

- The PCE price index is a chained Fisher index.
- A Fisher price index is designed to better capture the changes in consumers' demand for goods and services due to price changes than traditional methods.
- A chained Fisher index uses both prices and quantities from adjoining time periods, and its calculation involves both a Laspeyres price index and a Paasche price index.

# Formula

- In this example, the Laspeyres index uses a basket of goods and services from the previous period $(q_{t-1})$ and then computes the ratio of the value of the basket using current prices $(p_t)$ to the value of the basket using prices from the previous period $(p_{t-1})$. The formula is provided on the next page.

- The Paasche index performs a similar comparison except that it uses a basket of goods and services in the current period $(q_t)$. The formula is provided on the next page.

# Chained Fisher Index

- The change in a chained Fisher index from one time period to the next is the geometric mean of the changes in the Laspeyres index and the Paasche index between those periods.

$$(Fisher\ price\ index)_t = \sqrt{(Laspeyres\ Price\ Index)_t \cdot (Paasche\ Price\ Index)_t}$$

$$= \sqrt{\left(\frac{\sum p_t q_{t\text{-}1}}{\sum p_{t\text{-}1} q_{t\text{-}1}}\right) \cdot \left(\frac{\sum p_t q_t}{\sum p_{t\text{-}1} q_t}\right)}$$

- The Fisher index yields growth for period *t*, which we denote as $(g_t)$.

# PCE Price Index

- Using the previous formula, the change in a chained Fisher index can be calculated for any time period.

- The PCE price index is then constructed by choosing a period as the base year $(p_0 = 100)$, and then using the calculated growths to determine the appropriate levels of the series. For example, the level of the price index in period 1 and period 2 would be given, respectively, by:

$$(p_1) = (p_0) \times (1 + g_1)$$
$$(p_2) = (p_1) \times (1 + g_2)$$