

Explanation of the Index Formula

In the absence of major weight revisions or sample changes, the index formula is most simply expressed as:

$$(1) I_{i:o} = \frac{\sum (q_o p_i)}{\sum (q_o p_o)} \times 100 = \frac{\sum (q_o p_o) \left(\frac{p_i}{p_o} \right)}{\sum (q_o p_o)} \times 100$$

This is the customary, oversimplified way of writing a price index formula to show that the q 's are held constant between major revisions. In actual practice, the basic data for weights are values, and the quantity and price elements of the " pq " values (p 's and q 's) are not separated.

With a weight revision, the formula becomes:

$$(2) I_{i:o} = \frac{\sum (q_o p_{i-s})}{\sum (q_o p_o)} \times \frac{\sum (q_a p_i)}{\sum (q_a p_{i-s})} \times 100$$

where q is a derived composite of the annual quantities purchased in a weight base period for a bundle of goods and services to be represented by the specific item priced

p and p^* are the average prices of the specific commodities or services selected for pricing (the superscript indicates that the average prices are not necessarily derived from identical samples of outlets and specifications over long periods)

$i-s$ is the month preceding a weight revision (most recently, December 1963)

i is the current month

a is the period of the most recent consumer expenditure survey (1960-61) from which the revised weights were derived

o is the reference base period of the index (1957-59).

The $(q_o p_o)$ or $(q_a p_{i-s})$ base "weights" for a given priced item are the average expenditures in a weight base period represented by that item (including expenditures for the item itself and for other similar non-priced items).

In actual practice, this expenditure is projected forward for each pricing period by the price relative for the priced item:

$$(q_a p_i) = (q_a p_{i-1}) \left(\frac{p_i}{p_{i-1}} \right)$$