

Reconciling Two Measures of Consumer Price Change: Second Quarter 1990

This article continues the analysis of differences between two price measures—the Consumer Price Index (CPI-U) published by the Bureau of Labor Statistics and the Implicit Price Deflator for Personal Consumption Expenditures (PCE) published by the Bureau of Economic Analysis (BEA) of the Department of Commerce. More information on the technique of reconciliation is available in the September 1981 *Monthly Labor Review*.¹

The PCE is a byproduct of the National Income and Product Accounts of the BEA. Since the PCE obtains many of its components directly from the CPI, the construction of the aggregate indexes is the major cause of discrepancies between the two index series. The weights for the PCE are from the National Accounts while the CPI weights are derived from the Consumer Expenditure Survey. Also, unlike the CPI, the PCE calculations include expenditure patterns from persons in rural areas and from nonprofit organizations.

¹ Jack E. Triplett, "Reconciling the CPI and PCE Deflator," *Monthly Labor Review*, September 1981, pp. 3-15.

² The November 1985 *CPI Detailed Report* contains the final reconciliation (running through the third quarter of 1985) of the CPI and PCE using 1972 weights.

³ See "Reconciling Two Measures of Consumer Price Change: Second Quarter 1984," *CPI Detailed Report*, July 1984, pp. 4-6 for an explanation of the residual housing effect. A subsequent reconciliation appeared in the October 1984 *CPI Detailed Report*.

Prior to December 1985, when BEA rebased the PCE data from a 1972 to a 1982 reference base,² the residual housing effect contributed a substantial portion of the cumulative difference between the CPI and PCE.³ However, with the use of 1982 reference base, it is no longer a contributing factor, because both the CPI and the PCE have used a rental equivalence measure of homeowners' costs since the beginning of 1983.

Cumulative differences

The CPI remained at a lower level than the current-weight PCE through the second quarter of 1990 (see table C). Since 1982, the CPI has risen 34.2 percent while the PCE has increased 35.2 percent. The net difference of 1.0 percentage points is attributable to two partially offsetting factors—weighting differences and an aggregate of "other" effects. Weighting differences reflect the cumulative effect of the PCE using current, or moving, weights rather than 1982 fixed weights. As of the second quarter 1990, weighting accounted for a difference of 1.9 percent.

The weighting effect, however, was more than offset by a 2.9-percentage-point difference in "other" effects as measured by a comparison of the two Laspeyres-formula indexes, the CPI-U and the fixed-weight PCE. The fixed-weight

Table C. Comparison of cumulative changes in CPI indexes and Personal Consumption Expenditure price measures, 1982 to dates shown

(1982=100)

Price measure	1982 base period	1987	1988	1989	1989			1990	
					II	III	IV	I	II
CPI-U ¹	100.0	117.7	122.6	128.5	128.2	129.1	130.4	133.0	134.2
PCE: Current weight	100.0	119.8	124.2	129.9	129.5	130.2	131.8	134.0	135.2
Difference: Total effect	0	-2.1	-1.6	-1.4	-1.3	-1.1	-1.4	-1.0	-1.0
PCE: 1982 weight	100.0	120.7	125.6	131.6	131.3	132.1	133.7	136.1	137.1
PCE: Current weight	100.0	119.8	124.2	129.9	129.5	130.2	131.8	134.0	135.2
Difference: Weighting effect	0.0	.9	1.4	1.7	1.8	1.9	1.9	2.1	1.9
CPI-U ¹	100.0	117.7	122.6	128.5	128.2	129.1	130.4	133.0	134.2
PCE: 1982 weight	100.0	120.7	125.6	131.6	131.3	132.1	133.7	136.1	137.1
Difference: Other effect	0	-3.0	-3.0	-3.1	-3.1	-3.0	-3.3	-3.1	-2.9

¹ Indexes and percent changes for the CPI-U may differ from those previously published due to the BLS annual practice of revising seasonal factors.

Note: The Bureau of Economic Analysis periodically revises PCE data. For this reason, some of the figures in tables C and D may differ from those previously published.

Table D. Comparison of annual or quarterly percent changes in CPI and Personal Consumption Expenditure price measures, 1987-1990.¹

Price measure,	1987	1988	1989	1989			1990	
				I	II	III	IV	I
CPI-U ²	3.6	4.1	4.8	6.0	2.9	3.9	8.2	3.8
PCE: Chain weight	4.7	4.0	4.7	5.3	2.6	4.9	6.8	3.4
Difference: Total effect	-1.1	.1	.1	.7	.3	-1.0	1.4	.4
PCE: 1982 weight	4.7	4.1	4.8	5.7	2.7	4.7	7.4	3.1
PCE: Chain weight	4.7	4.0	4.7	5.3	2.6	4.9	6.8	3.4
Difference: Weighting effect	0	.1	.1	.4	.1	.2	.6	-.3
CPI-U ²	3.6	4.1	4.8	6.0	2.9	3.9	8.2	3.8
PCE: 1982 weight	4.7	4.1	4.8	5.7	2.7	4.7	7.4	3.1
Difference: Other effect	-1.1	.0	.0	.3	.2	-.8	.8	.7

¹ Indexes and percent changes for the CPI-U may differ from those previously published due to the BLS annual practice of revising seasonal factors.

² Annual average percent changes for the CPI-U are calculated from indexes on a 1982-84 reference base.

PCE has risen 37.1 percent since 1982, compared with the CPI's rise of 34.2 percent. Historically, "other" effects have mainly resulted from differences in seasonal adjustment methods, different market baskets, and the use of the Consumer Expenditure Survey data for determining the weight distribution in the CPI as opposed to the GNP composition used by the PCE to determine its weighting structure. The CPI began using weights derived from the 1982-84 Consumer Expenditure Survey in January 1987, whereas the PCE had been using 1982 based weights since 1982. This gap in weighting between 1982 and 1987 further contributed to cumulative differences reflected in "other" effects which occurred during that time period.

Period-to-period differences

When differences in the annual and quarterly rates of change in the CPI and PCE are analyzed (see table D), the chain-weight

PCE is used in place of the current-weight PCE.⁴ The chain-weight PCE uses the Laspeyres formula and obtains its weights from the first of the two periods being compared. The CPI-U rose at an annual rate of 3.8 percent between the first and second quarters of 1990, 0.4 percent more than the 3.4-percent rise in the chain-weight PCE. The weighting effect is determined by comparing the 1982 fixed-weighted PCE with the chain-weight PCE. For the second quarter of 1990, the weighting differences reflected a 0.3-percent slower rise in the fixed-weighted index. The difference between the rates for the CPI-U and the fixed-weight PCE represents the "other" effects factor, and showed a 0.7-percent more rapid rise in the CPI. During the first quarter, the CPI-U and the chain-weight PCE had increased at rates of 8.2 percent and 6.8 percent, respectively.

⁴ *CPI Detailed Report*, July 1984, p.5.